

# MASTOLOGY

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# MASTOLOGY

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# Contents

## ABSTRACTS

### ORAL PRESENTATION

- 2 Photobiomodulation in breast cancer radiodermatitis: photodermis, a double-blind randomized controlled trial (NCT04059809)**  
Francine Fischer Sgrott, Jaqueline Munaretto Tim Baiocchi, Glauco Baiocchi Neto, Pamela Cabral Finato Rech, Anderson da Cruz, Omar Sullivan Ruzza Filho, Lucas Sapienza
- 3 Immunomodulatory effects of honey from stingless bees and honey bees on breast cancer cells**  
Marla Alcolea, Renata Moraes Brito, Mahmi Fujimori, Adenilda Cristina Honorio-França, Eduardo Luzia França, Paula Becker Pertuzatti
- 4 Scintillating nanoparticles for x-ray-activated photodynamic therapy and next-generation in vivo dosimetry**  
Éder José Guidelli, Mileni Mayumi Isikawa
- 5 Genomic and clinical data analysis of ape1 protein, breast cancer stem cell phenotype, and hypoxic tumor microenvironment**  
Ísis Salviano Soares de Amorim, Priscyanne Barreto Siqueira, Mariana Moreno de Sousa Rodrigues, Andre Luiz Mencialha
- 6 De-escalation of chemotherapy in elderly women using a 70-gene platform – comparison of the mindact study with a real-world study in the brazilian population (AGEMA-BRA)**  
Fabio Postiglione Mansani, Vitória Rossetim Celinski, Ruffo de Freitas Junior
- 7 Multigene germline ngs testing in triple-negative breast cancer (TNBC)**  
Rafael Canfield Brianese, Karina Miranda Santiago, Giovana Tardin Torrezan, Marina de Brot, José Claudio Casali da Rocha, Fabiana Baroni Alves Makdissi, Dirce Maria Carraro
- 8 Triple-negative breast cancer patients have more abundant mirnas profiles derived from the peripheral blood circulating microvesicles as a tool of liquid biopsy**  
Letícia da Conceição Braga, Thayse Batista Moreira, Ana Luiza de Freitas Magalhães Gomes, Matheus Gomes de Souza, Paulo Guilherme de Oliveira Salles, Fábio Ribeiro Queiroz
- 9 Circulating neutrophil-derived microvesicles as a potential diagnostic marker in breast cancer patients**  
Thayse Batista Moreira, Marina Malheiros Araújo Silvestrini, Ana Luiza de Freitas Magalhães Gomes, Erick Matos Santos, Paulo Guilherme de Oliveira Salles, Letícia Conceição Braga, Andréa Teixeira de Carvalho
- 10 Prevalence of PD-1 among patients with metastatic triple-negative metastatic breast cancer (mTNBC) and its association with tumor-infiltrating lymphocytes (TIL)**  
Ana Carolina de Aquino Diniz, Romualdo Barroso de Sousa, Artur Katz, Ricardo Garcia Pastorello, Maria Paula Furtado Santos, Mariana Petaccia de Macedo, Rudinei Diogo Marques Linck
- 11 Comparative analysis of the degree of patient satisfaction after breast-conserving surgery with or without oncoplastic surgery: a systematic review and meta-analysis**  
Fabiana Christina Araújo Pereira Lisboa, Lucimara Priscila Campos Veras, Régis Resende Paulinelli, João Batista de Sousa
- 12 Tissue expander or permanent implant in immediate breast reconstruction after mastectomy? A systematic review**  
María Laura Ramos Pérez, Talita Aparecida Riegas Mendes, Idam de Oliveira-Junior
- 13 Multi-centre prospective evaluation of negative pressure wound therapy (NPWT) in patients undergoing oncoplastic breast surgery**  
Muskaan Khosla, Raghavan Vidya, Kim Baek, Vinayagam R, Lydia Prusty, Mr Dinesh Thekkinkattil, Siobhan Laws, Stergios Douvetzemis
- 14 Validation of a novel in vitro breast cancer chemoresistance platform in neoadjuvant setting**  
Martina Lichtenfels, Camila Alves da Silva, Alessandra Borba Anton de Souza, Heloisa Rezende, Luiza Kobe, Isabela Miranda, Antônio Luiz Frasson, Caroline Brunetto de Farias
- 15 Deep learning neural network image analysis of immunohistochemical protein expression reveals a significantly reduced expression of biglycan in breast cancer**  
Ana Paula Thiesen, Bruna Mielczarski, Ricardo Francalacci Savaris
- 16 Investigation of circulating tumor DNA (ctDNA) in patients with non-metastatic triple-negative breast cancer (TNBC) submitted to neoadjuvant chemotherapy**  
Rafael Canfield Brianese, Giovana Tardin Torrezan, Marina de Brot Andrade, Vladimir Claudio Cordeiro de Lima, Solange Moraes Sanches, Maria Nirvana da Cruz Formiga, Fabiana Baroni Alves Makdissi, Dirce Maria Carraro

## COMMENTED POSTER

- 17 Multigene panel testing for breast cancer predisposition in Brazilian patients**  
Daniele Paixão, Giovana Tardin Torrezan, Karina Miranda Santiago, Maria Nirvana Formiga, Emmanuel Dias Neto, Israel Tojal da Silva, Paz Polak, Dirce Maria Carraro
- 18 Application of a remote, fully oriented personalized program of physical exercise for women in follow-up after breast cancer treatment: effects on body composition and physical fitness**  
José Claudio Casali da Rocha, Édipo Giovanni França-Lara, Saulo Henrique Weber, Ricardo de Aurino Pinho, Selene Elifio-Esposito
- 19 Early-onset breast cancer patients fulfilling hereditary breast and ovary cancer and li-fraumeni-like syndromes can harbor tp53 pathogenic variants**  
Paula Francinete Faustino da Silva, Rebeca Mota Goveia, Thais Bomfim Teixeira, Bruno Faulin Gamba, Aliny Pereira de Lima, Sílvia Regina Rogatto, Ruffo de Freitas Júnior, Elisângela de Paula Silveira-Lacerda
- 20 Comparison of functional performance and kinesiphobia between breast cancer survivors and apparently healthy women**  
Vitor Alves Marques, Wanderson dos Santos, João Ferreira-Junior, Maria Silva Naiany Silva, Rafael Alves, Flavia Noleto, Carlos Vieira,
- 21 MIR-26a and MIR-181c profile highlight as potential prognosis biomarkers in triple-negative breast cancer patients**  
Bárbara Danielle Silva Siqueira, Bianca Nataliene Carvalho de Camargos, Ana Luiza de Freitas, Paulo Guilherme de Oliveira Salles, Clécio Ênio Murta de Lucena, Letícia da Conceição Braga, Luciana Maria Silva Lopes
- 22 Determinants of survival on Brazilian patients with breast cancer in public and private practice**  
Ridania de Oliveira Frederice, Alan Andresson Lima Pereira, Felipe Eduardo Martins de Andrade, Samir Abdallah Hanna, Heloisa de Andrade Carvalho, Gustavo Nader Marta
- 23 Effect of acupuncture and exercise therapy on muscular strength, lymphedema, and quality of life in breast cancer survivors**  
Patricia Santolia Giron, Cinira Assad Simão Haddad, Samantha Karla Lopes de Almeida Rizzi, Simone Elias, Afonso Celso Pinto Nazário, Gil Facina
- 24 The impact of the covid-19 pandemic on the performance of mammographies in the Brazilian northeast: an ecological study**  
Danyelle Santos Novaes, João Paulo Medrado Santos, Camille Teles Ferreira de Almeida, Dandara Rocha Ramos, Manuela Santana Aguiar
- 25 Evaluation of an e-health program: results in the emotional well-being of Brazilian patients with breast cancer**  
Isabella Barros Rabelo Gontijo Tume, Cristiane Decat Bergerot, Mizza Nery Rocha Jacinto, Isabella Ferreira Santos, Moisés de Sousa, Lorena Nascimento Manrique Mollina, Daniel Fernandes Barbosa, Ruffo Freitas-Junior
- 26 Somatic mutational landscape characterization of metastatic breast cancer in Brazil**  
Yuri Cardoso Rodrigues Beckedorff Bittencourt, Lucas Soares Almada, Tatiana Strava Corrêa, Daniele Xavier Assad, Marina Sahade Gonçalves, Andrea Kazumi Shimada, Artur Katz, Romualdo Barroso-Sousa
- 27 Hereditary breast cancer in the public health system of Federal District (DF) – Brazil**  
Tatiana Strava Correa, Eduarda Sabá Cordeiro de Oliveira, Ana Carolina Rathsam Leite, Luiza Nardin Weis, Fernanda Cesar Moura, Jéssica da Costa Leite, Renata Lazari Sandoval, Romualdo Barroso de Sousa
- 28 Fat loss solutions for overweight breast cancer patients with sleep disturbances**  
Diana Artene
- 29 Opportunistic mammographic screening indicators in a decade in the state of Goiás: technical, social, and economic characteristics**  
Rosângela da Silveira Corrêa, João Emílio Peixoto, Rosemar Macedo Sousa Rahal, Danielle Cristina Netto Rodrigues, Lucy Aparecida Parreira Marins, Suzana Alves Bastos, Ruffo de Freitas Júnior
- 30 Diagnosis of breast cancer in Brazil: reflection on the impact of the COVID-19**  
Maria Fernanda Passos Rocha Ramos, Dandara Rocha Ramos, Paulus Fabricio Mascarenhas Ramos, Katia de Miranda Avena
- 31 Standardization of the ficoll gradient technique for the isolation of mononuclear cells from peripheral blood**  
Erick de Matos Santos, Thayse Batista Moreira, Ana Luiza de Freitas Magalhães Gomes, Ana Paula Alvares Ramos, Fábio Ribeiro Queiroz, Paulo Guilherme de Oliveira Salles, Letícia Conceição Braga
- 32 Evaluation of cyp2d6 polymorphism in patients with breast cancer and tamoxifen users of two breast services of Belo Horizonte**  
Geovanna Cota Caetano, Julia Assis Rodrigues, Patrícia Aguiar Bellini, Clécio Ênio Murta de Lucena, Renata Toscano Simões, Valéria Cristina Sandrim

- 33 Tamoxifen adjuvant interferers study (tais study): an explorative analysis of (Z)-endoxifen and early recurrence of breast cancer in a prospective Brazilian study**  
José Claudio Casali da Rocha, Thais Almeida, Werner Schroth, Jeanine Nardin, Thomas Mürdter, Stefan Winte, Reiner Hoppe, Hiltrud Brauch
- 34 Does the body mass index (bmi) impact the overall survival (OS) of Brazilian women with breast cancer (BC) who have achieved pathological complete response (pCR) after neoadjuvant chemotherapy (NCT)?**  
Fernanda Grace Bauk Richter, André Mattar, Marcelo Antonini, Juliana Monte Real, Reginaldo Guedes Coelho Lopes, Luís Henrique Gebrim
- 35 Neoadjuvant chemotherapy of breast cancer without further surgical intervention**  
Hagigat Valiyeva, Nigar Mehdiyeva, Elcin Huseynov, Tahmina Kosayeva, Emil Aghayev, Ismail Gafarov
- 36 Adherence to adjuvant endocrine therapy and its determining factors in patients with breast cancer**  
Anna Luiza Zapalowski Galvão, Danielle Laperche dos Santos, Romualdo Barroso de Sousa, Daniele Assad Suzuki

## E-POSTER

- 37 Influence of covid-19 on breast cancer diagnosis and follow-up in Brazil**  
Maria Fernanda Passos Rocha Ramos, Dandara Rocha Ramos, Paulus Fabricio Mascarenhas Ramos, Katia de Miranda Avena, Isabela Gonçalves de Araújo Sousa
- 38 Comparative analysis between screening mammography performed in patients at usual risk and patients at high risk for breast cancer**  
Gabriel Duque Pannain, Marcelo Antonini, Odair Ferraro, Andre Mattar Reginaldo Guedes Coelho Lopes, Juliana Monte Real
- 39 Vacuum-assisted excision (VAE): a potentially approach for percutaneous treatment of small breast tumors**  
Carolina Nazareth Valadares, Henrique Lima Couto, Aleida Nazareth Soares, Stuart A. McIntosh, Nisha Sharma, Paola Hartung Toppa, Vivian Resende
- 40 Obstacles faced by breast cancer patients: from early diagnosis to treatment diagnosis to treatment**  
Christina Souto Cavalcante Costa, Rosemar Macedo Sousa Rahal, Leonardo Ribeiro Soares, Gustavo Nader Marta, Debora Sara de Almeida Cardoso, Rafaela Dutra Silva
- 41 The COVID-19 pandemic and loss of breast reconstruction services: has it affected patient quality of life and well-being?**  
Jenna Shepherd, Sue Rodwell, Rachel Moir, Mairi Fuller, Beatrix Elsberger, Yazan Masannat
- 42 A retrospective analysis of 4,466 luminal breast cancer treated in a reference center**  
Andre Mattar, Andressa Amorim, Jorge Yoshinori Shida, Luiz Henrique Gebrim
- 43 Overview of mammography in Goiás between 2016 and 2021**  
Kallyta Myllena e Silva, Micaellem Rodrigues Santos da Silva, Wanessa Rocha Costa, Leonardo Ribeiro Soares
- 44 Breast cancer treatment delay-associated factors in northern Minas Gerais**  
Carolina Lamac Figueiredo, Patrícia Helena Costa Mendes, Antônio Prates Caldeira, Clécio Ênio Murta de Lucena, Bertha Andrade Coelho
- 45 Features and prognosis of stages I–IV breast cancer subtypes at the clinical Hospital of Botucatu Medical School – UNESP**  
Eduardo Carvalho Pessoa, Ana Beatriz da Silva Pina, Carla Priscila Kamiya Carvalho Pessoa, Heloisa Maria de Lucca Vespoli, Benedito de Souza Almeida Filho, Julia Araujo de Oliveira, Fernando Schmitt
- 49 Free nipple graft: current indications and applications of a centenary breast surgery technique – a literature review**  
Rafael Araujo Ponce de Leon
- 50 Influence of the type of criteria used for classification of the best studies in medical events**  
René Aloisio da Costa Vieira, Regis Resente Paulinelli, Fábio Francisco Oliveira Rodrigues, Marise Amaral Rebouças Moreira, Ricardo Caponero, Rosemar Macedo Sousa Rahal, Gil Facina, Ruffo de Freitas Junior
- 51 Characterization of chronic pain in women submitted to breast cancer treatment**  
Leonardo Ribeiro Soares, Rosemar Macedo Sousa Rahal, Hadirgiton Garcia Gomes de Andrade, Luis Fernando Padua Oliveira, Nayara Alves de Freitas Lemos
- 52 Screening mammography before and during the COVID-19 pandemics in Brazil: an analysis from public registries**  
Annamaria Massahud Rodrigues dos Santos, Débora Balabram
- 53 Evaluation of malignancy underestimation in breast papillary lesions diagnosed at percutaneous biopsy in a south Brazilian anatomopathological laboratory center**  
Flávia da Rocha Lapa, Karina Munhoz de Paula Alves Coelho, Lara Cristina de Carvalho Tavares, Aneline Brusamarello



- 54 Access to breast cancer treatment associated with sociodemographic and lifestyle characteristics**  
José Euderaldo Costa Gomes Filho, Gisele Aparecida Fernandes, Rossana Verónica Mendoza López, Maria Paula Curado
- 55 Palliative care: a multiprofessional approach in patients with breast cancer**  
Laura Beatriz Rocha Falcão Carneiro, Ana Carolina Santos Huoya, Dálete Guímel Correia Santos, Isabela Gonçalves de Araujo Sousa, João Paulo Velloso Medrado Santos, Maria Fernanda Passos Rocha Ramos, Raiane Aparecida Santos Nascimento, Victoria Maria Novais
- 56 Is there any difference in locoregional recurrences after conserving breast surgery in patients over 70 years old compared with patient below?**  
Marcelo Antonini, Matheus de Paula Solino, Mariana Soares Cardoso, Odair Ferraro, Reginaldo Guedes Coelho Lopes, Juliana Monte Real
- 57 Analysis of the r337h variant in the TP53 gene in a group of premenopausal women with breast cancer from the central-western region of Brazil: a pilot study**  
Igor Lopes dos Santos, Nathalia Amaral Nogueira, Luciana Corrêa Amador, Pedro Paulo Batista de Abreu, Deidimar Cássia Batista Abreu, Flavio Monteiro Ayres, Vera Aparecida Saddi
- 58 Analysis of tumor response in the breast and axilla according to molecular subtype in breast cancer patients submitted to neoadjuvant chemotherapy**  
Nayara Carvalho de Sá, Clécio Ênio Lucena, Flávio Silva Brandão, Douglas de Miranda Pires, Henrique Lima Couto, Marcelo Henrique Mamede Lewer, Roberta Nogueira Furtado Ferreira
- 59 Mammographic screening coverage in elderly women in Brazil**  
Aline Ferreira Bandeira de Melo Rocha, Ruffo de Freitas Júnior, Rosemar Macedo Sousa Rahal, Danielle Cristina Cristina Netto Rodrigues, Rosângela da Silveira Corrêa, Glalber Luiz da Rocha Ferreira, Edésio Martins
- 60 Assessment of weight and its relationship with breast cancer in a clinical oncology service in the Federal District**  
Kamila Fernandes Ferreira, Luiza Nardin Weis, Leandro Almeida Assunção, Rafael Amaral de Castro
- 61 Immunophenotyping of breast cancer associated with malignant tumor classification and histopathological features**  
José Euderaldo Costa Gomes Filho, Gisele Aparecida Fernandes, Rossana Verónica Mendoza López, Maria Paula Curado
- 62 The influence of physical exercise as integrative, complementary practice on patients with breast cancer diagnostic: a literature review**  
Letícia Andrade Silveira, Beatriz Santos da Paz, Thamara Rafaella Costa de Jesus, Marcus de Souza Alves
- 63 Macroscopic evaluation of the pathological margin in patients with breast cancer during breast-conserving surgery**  
Etienne El-Helou, Claudia Stanciu-Pop, Michel Moreau, Marie Chintinne, Nicolas Sirtaine, Denis Larsimont, Isabelle Veys, Catalin Florin Pop
- 64 Systemic treatment for early-stage triple-negative breast cancer: a recommendation from an expert panel of the Brazilian society of mastology**  
Felipe Pereira Zerwes, Ruffo de Freitas Junior, Vilmar Marques de Oliveira, Antonio Luiz Frasson, Francisco Pimentel Cavalcante, Fabio Postiglione Mansani, Andre Mattar
- 65 Evaluation of the clinical parameters of a group of patients with triple-negative breast tumors**  
Jane Braga da Silva, Patrícia Bittencourt Marques Lauria, Clécio Ênio Murta de Lucena, Mayra de Oliveira Santos
- 66 Clinicopathological features associated with the prognosis of young women with breast cancer in Brazil**  
Igor Lopes dos Santos, Nathalia Amaral Nogueira, Luciana Corrêa Amador, Pedro Paulo Batista de Abreu, Deidimar Cássia Batista Abreu, Flavio Monteiro Ayres, Vera Aparecida Saddi
- 67 Conducting breast cancer research during a pandemic isolation time**  
Junia Costa Carvalho, Natália Tomaz Pires, Silvana Soares dos Santos, Christina Haas Tarabay, Solange Moraes Sanches, Guilherme Rocha Melo Gondim, Fabiana Baroni Alves Makdissi
- 68 Access to breast cancer treatment associated with malignant tumor classification and histopathological characteristics**  
José Euderaldo Costa Gomes Filho, Gisele Aparecida Fernandes, Rossana Verónica Mendoza López, Maria Paula Curado
- 69 Locoregional treatment for early-stage triple-negative breast cancer: a recommendation from an expert panel of the Brazilian society of mastology**  
Leonardo Ribeiro Soares, Vilmar Marques de Oliveira, Antonio Luiz Frasson, Francisco Pimentel Cavalcante, Fabio Postiglione Mansani, André Mattar, Felipe Pereira Zerwes, Ruffo Freitas-Junior
- 70 Self-perception of happiness in women with breast cancer**  
Maria Cristina Figueroa Magalhães, João Gabriel Vicentini Karvat, Jéssica Heloíse Camargo de Lima, Ricardo Pasquini Neto

- 71 Breast reconstruction with and without adjuvant radiotherapy: a critical review**  
Maria Luiza de Oliveira Almeida Bax, Clécio Ênio Murta de Lucena, Calliny Cristina Pimentel Alves, Matheus Assis dos Anjos Bastos Oliveira
- 72 Prevalence study of clinical indications for breast MRI**  
Ilse Franco de Oliveira, Camila Leal Diniz, Rosemar Macedo de Souza Rahal, Macks Wendhell Gonçalves, Cristina Pinto Naldi Ruiz, Marcelo Vilela Lauar, Paulinely Messias de Almeida, Ruffo Freitas-Junior
- 73 Immunophenotyping of breast cancer associated with sociodemographic and lifestyle characteristics**  
José Euderaldo Costa Gomes Filho, Gisele Aparecida Fernandes, Rossana Verónica Mendoza López, Maria Paula Curado
- 74 Clinical characterization of patients with breast cancer doing follow-up on a reference hospital in the west of Santa Catarina State, Brazil**  
Maria Laura Peraça Duarte, Marília Elis Reichert, Aline Mânica
- 75 Analysis of women with breast cancer submitted to immediate or delayed breast reconstruction**  
Darley de Lima Ferreira Filho, Nancy Cristina Ferraz de Lucena Ferreira, Thais Ferreira
- 76 Axillary lymph node clip placement and resection at surgery: a single-center study**  
Graziela Couto de Carvalho, Heloisa Helena Gonçalves Rengel, Barbara Barbosa Monteiro, Larissa Scarabucci Venezian, Aline Campos Oliveira Mello, Fábio Francisco Oliveira Rodrigues
- 77 Epidemiological analysis of women with breast cancer submitted to breast reconstruction in a tertiary hospital in Pernambuco**  
Darley Ferreira de Lima Filho, Nancy Cristina Ferraz de Lucena Ferreira, Thais de Lucena Ferreira
- 78 Deleterious variants in RAD51C gene and breast cancer – report of three patients with triple-negative breast cancer**  
Elis Nogara Lisboa, Rita de Cassia Lima, Leticia Taniwaki, Rafael Aliosha Kaliks Guendelmann, Donato Callegaro Filho, Fernando Cotait Maluf, Fernanda Teresa de Lima,
- 79 Ultrasound-guided vacuum-assisted resection: report of a case series**  
Katyane Larissa Alves, Frank Lane Braga Rodrigues, Sebastião Alves Pinto, Ruffo Freitas-Junior
- 80 Neuroendocrine carcinoma of the breast and ileum in a patient with BRCA2 pathogenic variant – oncologic and genetic considerations derived from a case report**  
Andreza Karine de Barros Almeida Souto, Poliana Bergamaschine Giovani Blasi, Brenda Fabiola Delgado Taboada, Fernanda Teresa Lima, Bernardo Garicochea, Cristiano Augusto Andrade de Resende
- 81 Male breast cancer associated with a large deletion in BLM gene – report of a case**  
Fernanda Teresa de Lima, Madeleyne Beatriz Boado Quiroga Cardenas, Gabriela de Almeida Vasconcelos Costa, Mary Miyazawa Simomoto, Afonso Celso Pinto Nazario, Joaquim Teodoro Araujo Neto, Wagner Antonio da Rosa Baratela, Gil Facina
- 82 Breast plasmacytoma: a case treated with irradiation that evolved to further bilateral breast involvement and systemic disease refractory to chemotherapy**  
Jorge Illarramendi Esteban, Ivan Quispe, Mercedes Rodriguez, Irati Ormazabal, Alicia Cordoba, Geranie Ruiz de Azua, María José Pons, Ana Manterola
- 83 Prepectoral breast reconstruction: a preliminary report of a chilean experience in 46 patients**  
Jaime Letzkus, María José del Río, Jorge Gamboa Galté, José Manuel Lagos Bononato, G. Alejandro Belmar, Andrea Sepúlveda H.
- 84 Case report: physiotherapy teleservice in the immediate postoperative breast cancer surgery**  
Lais de Abreu Trevisan, Barbara Valente de Oliveira, Gisela Rosa Franco Salerno, Rafael de Albuquerque Lima, Marcelo Antonini
- 85 Sentinel node biopsy with magtrace® in a her2-positive patient diagnosed during pregnancy with complete clinical response to neoadjuvant treatment**  
Jaime Letzkus, Jorge Gamboa Galté, María José del Río, Alejandro Belmar, José Manuel Lagos Bononato, Andrea Sepúlveda
- 86 Iron overload in a breast cancer patient with a homozygous mutation in the hfe hemostatic iron regulator gene: considerations regarding the use of adjuvant hormone therapy**  
Jorge Illarramendi Esteban, Montserrat Alvarellos, Mercedes Rodriguez, Amaya Zabalza, José Juan Illarramendi
- 87 Locally advanced synchronous bilateral breast cancer: a rare case report**  
Rosana Zabolon Feijó Belluco, Carolina Gaze Gonçalves Fontenele Gomes, Paulo Eduardo Silva Belluco, Vitória Vasconcelos de Lara Resende, Júllia Eduarda Feijó Belluco, Flávio Lúcio Vasconcelos, Melissa de Andrade Baqueiro
- 88 Metastatic breast cancer to the uterine cervix: a case report**  
Jordana Joab Alencar Barros, Alexandre Bravin Moreira, Paulo Roberto Moreira Sousa, Tatiane Oliveira Borges, Luciana Carla Belém dos Santos, Catharina Maria Faccioli Blum

- 89 Sporotrichosis in axillary lymphadenopathy simulating recurrence of breast neoplasm: a case report**  
Katyane Larissa Alves, Frank Lane Braga Rodrigues, Sebastião Alves Pinto, Ruffo de Freitas-Junior
- 90 Primary breast tuberculosis mastitis manifested as non-healing abscess**  
Etienne El-Helou, Huu Hoang, Catalin-Florin Pop, Ammar Shall, Manar Zaiter, Jessica Naccour, Xuan Dung Ho, Van Cau Nguyen
- 91 Incidental finding of solitary fibrous tumor of male breast**  
Etienne El-Helou, Manar Zaiter, Pauline Delrue, Ahmad Awada, Isabelle Veys, Catalin-Florin Pop
- 92 Extreme oncoplastic surgery in a patient with breast cancer and macromastia**  
José Manuel Lagos Bononato, Jaime Letzkus Berrios, Jorge Gamboa Galte, María José Del Río Vigil, Guillermo Belmar Soto, Andrea Sepúlveda Hales
- 93 Hypercalcemia in newborn secondary to malignant hypercalcemia in pregnant woman with metastatic breast cancer: a case report**  
Matheus Lavigne Marinho, Jéssica de Jesus Simões Evaristo, Yuri Vieira Campos Soares, Gabriela de Oliveira, Luis Henrique Dias Lima, Clara Sobreira Dias Lopes, Carolina Martins Vieira, Theara Cendi Fagundes
- 94 Conservative surgery in adenoid cystic carcinoma: a case report**  
Mayra de Oliveira Santos, Patrícia Bittencourt Marques Lauria, Isadora Maria de Oliveira Santos, Maxlânio Azevedo Borges, Cristiana Buzelin Nunes, Jane Braga da Silva, Clécio Ênio Murta de Lucena
- 95 Thoracic reconstruction: the importance of plastic surgery in oncology treatments**  
Iuri Fernando Coutinho e Silva, Pedro Inácio Oliveira Lopes, Andrea Amalia Campos Pimentel, Mario Sales Neves do Carmo Filho, Pablo Rassi Florêncio, Bruno Carvalho Moreira
- 96 Photobiomodulation and manual lymph drainage for the treatment of nipple necrosis in breast cancer patient: two case reports**  
Francine Fischer Sgrott, Jaqueline Munaretto Tim Baiocchi, Francilma Catão
- 97 The importance of managing B3 lesions: a case report**  
Carlos Ricardo Chagas, Natascha Carneiro Chagas, Nathália Alves Silva, Gabriela Del Prete Magalhães, Sálua Saud Bedran
- 98 Primary invasive ductal carcinoma of axillary accessory breast**  
Etienne El-Helou, Catalin-Florin Pop, Ammar Shall, Manar Zaiter, Jessica Naccour, Huu Hoang, Thi Hoa Nguyen, Xuan Dung Ho
- 99 Ductal in situ arising in fibroadenoma of the breast**  
Fernando Silva de Carvalho, Carlos Ricardo Chagas, Sandra Mendes Carneiro, Sálua S. Bedran, Natascha Carneiro Chagas
- 100 Primary angiosarcoma of the breast: a case report**  
Carlos Ricardo Chagas, Ricardo Pinto, José Antônio Franco, Gabriela Del Prete Magalhães, Natascha Carneiro Chagas

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# PHOTOBIMODULATION IN BREAST CANCER RADIODERMATITIS: PHOTODERMIS, A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL (NCT04059809)

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**Objective:** The aim of this study was to evaluate the impact of photobiomodulation (PBM) in reducing the prevalence of radiodermatitis in breast cancer. **Methods:** A randomized, double-blind controlled trial was carried out and included women who underwent conservative surgery or mastectomy and were treated with 3D radiotherapy. Patients were randomly assigned (1:1) to receive usual skin care ± red PBM (660 nm) with an energy of 3 joules per point every 2 cm across the breast for 10 min. The degree of radiodermatitis was blindly evaluated by two professionals every 5 days from D5 to D30 of adjuvant radiotherapy. The control group had the PBM device positioned but was not turned on. The device was positioned on top of the operated breast (plastron). Axillary, inframammary, and supraclavicular regions were excluded from the PBM device template. **Results:** In all, 48 women were included in the study (26 women in the PBM group and 22 in the control group). The median age was 51.5 years (range 29–78), and the median total radiation dose was 50.4 Gy (range 42–55). The clinical and pathological variables did not differ between groups. A total of 16 (33.3%) cases had radiodermatitis in the breast plastron and 42 (87.5%) outside the breast plastron area. Radiodermatitis in the breast plastron was significantly lower in the PBM group compared to that in the control group [11.5% vs. 59.1%; hazard ratio (HR) 0.090 (95%CI 0.021–0.39); p=0.001]. However, there was no difference in radiodermatitis rates outside the breast area (not involved with PBM) for the PBM group compared to that in the control group [88.5% vs. 86.4%; HR 1.21 (95%CI 0.21–6.7); p=0.82]. Additionally, 2 (7.7%) cases in the PBM group and 12 (54.5%) cases in the control group had radiodermatitis in both breast and non-breast regions [HR 0.069 (95%CI 0.013–0.36); p=0.002]. **Conclusion:** Our results suggest that PBM in women with breast cancer treated with adjuvant radiation significantly reduces the risk of radiodermatitis.

**Keywords:** Breast neoplasms. Low level laser therapy. Photobiomodulation. Radiation. Radiation oncology. Radiotherapy-induced skin reactions.

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# IMMUNOMODULATORY EFFECTS OF HONEY FROM STINGLESS BEES AND HONEY BEES ON BREAST CANCER CELLS

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**Objective:** The limitations of current cancer treatments and their side effects have led to a growing interest in the study of natural compounds and alternative therapies such as apitherapy. Honey has in its constitution several substances that contribute to neutralize free radicals, such as phenolic compounds of which stand out in flavonoids and phenolic acids, besides having important antimicrobial and antitumor activities. However, the mechanisms of the antitumor action of honey and how the characteristics of honey of different species influence this mechanism are poorly understood. The aim of this study was to verify the antitumor action of honey bees (*Apis mellifera*) and stingless bees (*Tetragonisca angustula*) honey in mammary adenocarcinoma cell lines (MCF-7). **Methods:** Cell viability analyses were performed using fluorescence and flow cytometry methods, and oxidative balance through the release of superoxide anion ( $O_2^-$ ) and production of the enzyme superoxide dismutase (SOD) in human peripheral blood mononuclear (MN) cells, MCF-7, and coculture of both. **Results:** Viability analyses in MN cells showed that honey samples, at concentrations of 100 mg/mL, 100 ng/mL, and 100 pg/mL, do not present cytotoxicity to cells. But in MCF-7 cells, there was a decrease in viability with stingless bee honey (100 mg/mL), showing the highest cytotoxic action and reducing the viability of cancer cells by 30.4%. The same honey sample caused an immunomodulatory effect on both MN and cancer cells, stimulating greater release of  $O_2^-$  and SOD enzyme activity in these cells. While in the coculture, there was a greater release of  $O_2^-$  and a decrease in enzymatic activity. **Conclusion:** The results showed that especially stingless bee honey acts on the oxidative stress of cells, and this might be the mechanism related to its antitumor action. Thus, honey can play a potential role as a preventive agent and complementary therapy against breast cancer.

**Keywords:** Breast cancer. Antioxidant activity. Phenolic compounds. Immunomodulation.

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# SCINTILLATING NANOPARTICLES FOR X-RAY-ACTIVATED PHOTODYNAMIC THERAPY AND NEXT-GENERATION IN VIVO DOSIMETRY

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**Objective:** The aim of this study was to develop scintillating nanoparticles to simultaneously monitor the x-ray dose delivered to tumors during treatments with x-ray-activated photodynamic therapy (X-PDT). **Methods:** A microfluidic synthesis was developed to grow GdF<sub>3</sub>:Eu theranostic scintillating nanoparticles (ScNPs). The flow reaction was optimized to enhance scintillation emission from the Eu+3 ions. **Results:** The as-prepared ~15 nm rhombohedral-shaped nanoparticles self-assembled into ~100 nm mesoporous flower-like nanostructures, but the rhombohedral units remained intact and the scintillation spectra were unaltered. The conjugation of the ScNPs with multilayers of methylene blue (MB) in a core-shell structure (GdF@MB) resulted in enhanced singlet oxygen ( $^1O_2$ ) generation under x-ray irradiation, with maximum  $^1O_2$  production for nanoparticles with 4 MB layers (GdF@4MB). High  $^1O_2$  yield was further evidenced in cytotoxicity assays, demonstrating complete cell death only for the association of ScNPs with MB and x-rays. Because the scintillating Eu+3 emission at 694 nm was within the therapeutic window and was only partially absorbed by the MB molecules, it was explored for getting in vivo dosimetric information. Using porcine skin and fat to simulate the optical and radiological properties of human tissues, we showed that the scintillation light can be detected for a tissue layer of ~16 mm, thick enough to be employed in radiotherapy treatments of breast cancers, for instance. **Conclusion:** The GdF<sub>3</sub>:Eu ScNPs and the GdF@4MB nanoconjugates are strong candidates for treating cancer with X-PDT while monitoring the treatment and the radiation dose delivered, opening new avenues to develop a next-generation modality of real-time in vivo dosimetry.

**Keywords:** Nanoparticles. Luminescence. Lanthanides. Microfluidic. Radiotherapy. Dosimetry.

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# GENOMIC AND CLINICAL DATA ANALYSIS OF APE1 PROTEIN, BREAST CANCER STEM CELL PHENOTYPE, AND HYPOXIC TUMOR MICROENVIRONMENT

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**Introduction:** Breast cancer (BC) is a heterogeneous disease at cellular and molecular levels. BC tumors present a cellular subpopulation of breast cancer stem cells (BCSCs) linked with tumor initiation and progression, recurrence, and therapeutic failure. The BCSC is preferentially found in hypoxic areas of the tumor, which are common features of BC and are significantly associated with worse prognosis. Although hypoxia activates an aggressive BCSC phenotype, the proteins that perform this molecular crossroad are still unknown. Therefore, finding proteins that performed this crossing would help define new promisors' clinical strategies. Apurine/Apyrimidine Endonuclease 1 (APE1) protein has emerged as a new therapeutic target in cancer treatment and is overexpressed in more aggressive BC tumors. However, the relationship of APE1 with BCSC considering the hypoxia microenvironment does not exist. **Objectives:** This study aimed to analyze the genomic/transcriptomic and clinical data of the APE1, BCSC phenotype, and hypoxic tumors. **Methods:** Genomic/transcription data and clinical attributes were collected and clustered on the Xena UCSC platform from The Cancer Genome Atlas (TCGA) BRCA database. Clinical molecular signatures from BCSC and hypoxia-related genes were used to separate BC patients in high or low expression groups for these genes and they evaluated their clinical data, including survival and APE1 expressions. **Results:** Patients with high expression of BCSC-related genes exhibited worse prognosis and overexpression of APE1. Additionally, high expression of hypoxia-related genes was also associated with worse prognosis and exhibited high levels of APE1. Patients with high expression of BCSC genes also exhibited high levels of hypoxia-related genes. APE1, BCSC, and hypoxia-related genes were more expressed in BC compared to adjacent normal samples. **Conclusion:** Data suggest that APE1 is overexpressed in hypoxia and BCSC phenotype, which are associated with worse prognosis for BC.

**Keywords:** Apyrimidine endonuclease. Breast cancer. Stem cell. Hypoxia. Breast cancer. Prognosis.

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# DE-ESCALATION OF CHEMOTHERAPY IN ELDERLY WOMEN USING A 70-GENE PLATFORM – COMPARISON OF THE MINDACT STUDY WITH A REAL-WORLD STUDY IN THE BRAZILIAN POPULATION (AGEMA-BRA)

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**Introduction:** Breast cancer is the most common malignant neoplasm in women, except for non-melanoma skin tumors, and the population pyramid demonstrates an aging trend in most countries; it is necessary to value the analysis of the therapies used in this population, but elderly, seeking the de-escalation of treatment, mainly reducing the use of chemotherapy drugs. In this context, the application of genetic signatures contributes to determine a less toxic treatment in these women with luminal biological profile tumors, where toxicity is less tolerated and with a higher risk of fatal outcomes by therapy. The MINDACT study evaluated this population using MammaPrint™, but patients over 70 years of age were poorly represented, corresponding only to 0.8% of the patients evaluated (56 of 6693 patients), and only 26 patients with high clinical risk. **Objective:** The aim of this study was to verify the possibility of de-escalation of systemic treatment with the use of MammaPrint™ genetic signature in elderly women by comparing the prevalence of data from the MINDACT study population with a cohort of Brazilian patients submitted to the examination (AGEMA-BRA). **Methods:** This is a cross-sectional study comparing the prevalence of low- and high-risk genomic patients in a population with luminal profile breast carcinoma with high clinical risk in MINDACT study populations with a Brazilian cohort older than 70 years, evaluated by the genetic signature MammaPrint™, between 2016 and 2020. This study describes the analysis of data with the estimation of simple and relative frequencies of variables in relation to low- and high-risk classification and study populations (AGEMA-BRA and MINDACT). Then, the chi-square test was used to verify the differences between the proportions. To measure the intensity of differences/associations, relative risks (RRs) and their 95% confidence intervals were calculated. The tests were considered significant when  $p < 0.05$ . **Results:** From a database of 950 patients submitted to MammaPrint™ analysis from 2016 to 2020, 7 were excluded due to incomplete data. The population over 70 years (71–84 years) at the time of diagnosis was represented by 89 patients (9.4%), all with high clinical risk. Of these patients, 54 (60.7%) corresponded to low genomic risk and 35 (39.3%) at high genomic risk. The comparative analysis between the prevalence of the Brazilian population and the MINDACT study, in which the low genomic risk was 61.5% and the high genomic risk was 38.5%, showed no statistical significance (RR 0.98 (0.69–1.39),  $p = 0.936$ ). **Conclusion:** The comparative analysis of the prevalence among the results of MammaPrint™ in the MINDACT study and in a cohort of Brazilian women (AGEMA-BRA) in the population older than 70 years showed no statistical difference. With the confirmation of MINDACT data in this age group in a threefold larger cohort (AGEMA-BRA), it is inferable that, although the low representativeness in the studies, the genetic signature of MammaPrint™ can be applied in the elderly women. The evaluation of outcomes regarding relapse-free survival and overall survival, an ongoing study, is necessary to confirm the data obtained.

**Keywords:** Breast cancer treatment. Genetic testing. Aged.



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## MULTIGENE GERMLINE NGS TESTING IN TRIPLE-NEGATIVE BREAST CANCER (TNBC)

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**Objective:** Triple-negative breast cancer (TNBC) is a breast cancer subtype strongly associated with BRCA1 germline mutations that are involved in homologous recombination DNA repair deficiency (HRD). Tumors with HRD may benefit from DNA-damage-inducing agents and PARP inhibitors. We aim to characterize germline mutations in HRD-related genes in TNBC and associate them with clinical data. **Methods:** TNBC patients (n=117) attending the A.C. Camargo Cancer Center had genetic testing performed by NGS (26–127 cancer predisposition gene panels) in leukocyte/saliva DNA. When possible, germline variants were screened in tumor DNA for loss-of-heterozygosity (LOH). **Results:** All patients were screened for germline variants: 26% (30/117) were Hereditary HRR-related, 21% BRCA1, 2% BRCA2, 2% PALB2, and 1% RAD51. For women diagnosed at a young age (<40 years), this rate increases to 38% (20/52), 31% BRCA1, 4% BRCA2, 2% PALB2, and 1% RAD51. In addition, 37% of cases presented variants of uncertain significance (VUS). LOH analysis showed that 100% (6/6) of pathogenic variants had LOH, while only 30% of VUS had LOH. Interestingly, for two cases with concurrent pathogenic and VUS, only the pathogenic variant exhibits LOH. Additionally, 47% (7/15) of the VUS with LOH were in HRR-related genes. **Conclusion:** The majority of germline variants in TNBC are in the BRCA1 gene, but other HRR-related genes also contribute to HRD. LOH analysis may help classify VUS regarding pathogenicity.

**Keywords:** Triple-negative breast cancer. Germline mutation. Loss of heterozygosity.

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# TRIPLE-NEGATIVE BREAST CANCER PATIENTS HAVE MORE ABUNDANT MIRNAS PROFILES DERIVED FROM THE PERIPHERAL BLOOD CIRCULATING MICROVESICLES AS A TOOL OF LIQUID BIOPSY

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**Objective:** The identification and characterization of miRNAs derived from microvesicles of breast cancer patients is the main goal of this study. **Methods:** A cohort of 28 patients was evaluated, 28.6% are HER2 overexpressed, 46.4% are triple-negative, and 25% are triple-positive. The study protocol was approved by the Ethics Committee of Instituto Mário Penna (CAEE 82703418.8.0000.5121). For this purpose, the peripheral blood was collected in EDTA tubes and obtained the red blood cell-free plasm. The microvesicles were purified from plasm using the microRNeasy kit (Qiagen) with posterior small RNA precipitation, according to manufacturer's instructions. The small RNA obtained was used for high throughput sequencing using the QIAseq miRNA Library kit (Qiagen) for library construction, according to manufacturer's instructions. The sequencing was performed by the Illumina NextSeq 550. The sequences obtained were filtered by quality, the adapters were removed, and small RNA patterns were evaluated using the Unitas (version 1.7.8). **Results:** The three groups of patients showed a significant abundance of miRNA profiles. The triple-negative breast cancer (TNBC) patients showed the highest relative abundance, which can be due to the more intense exocrine activity of this type of tumor. Furthermore, our results highlighted a great abundance of miR-223-3p in the TNBC patient group. **Conclusion:** Normally, TNBC patients have an aggressive condition of disease, and cell proliferation, migration, and invasion are common events. These characteristics can be regulated by miRNAs exported from tumor cells in microvesicles. Several miRNAs are already related to these events, and this makes them potential therapeutic or diagnostic targets for this disease. miR-223-3p was previously related to epithelial-mesenchymal transition, cell proliferation, and migration. This phenotypic effect is a strong indication that this miRNA could be used as a biomarker in TNBC management and opens great possibilities for further validation of this as a tool for liquid biopsy tests.

**Keywords:** miRNAs. Breast cancer. Microvesicles.

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# CIRCULATING NEUTROPHIL-DERIVED MICROVESICLES AS A POTENTIAL DIAGNOSTIC MARKER IN BREAST CANCER PATIENTS

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**Objective:** Due to the already observed importance of neutrophil-derived microvesicles (NMVs) in cancer development and progression, this study aims to quantify NMVs according to clinical staging and histological grade in the blood of breast cancer (BC) patients for a possible use in the liquid biopsy technique and personalized medicine, assisting in treatment decision. **Methods:** Peripheral blood was collected from 19 healthy women (control group) and from 51 patients with locally advanced BC (case group) in the Instituto Mário Penna, Belo Horizonte, Brazil. The study protocol was approved by the Ethics Committee of Instituto Mário Penna (CAEE 82703418.8.0000.5121). Clinical staging and histological grade data were obtained from the medical records of the study patients. The characterization of circulating NMVs was performed by immunophenotyping with specific neutrophil markers (CD66 and CD16), and quantification was performed by flow cytometry. **Results:** Our data showed a higher number of NMVs in BC patients, regardless of clinical staging and degree of tumor differentiation, when compared to the control group. Although no difference was observed in relation to the histopathological grade, the NMVs appear to have a potential diagnostic in BC patients. **Conclusion:** In a clinical scenario, they are going to use liquid biopsy as a candidate strategy to support clinical decision-making and guide therapeutic choices.

**Keywords:** Microvesicles. Breast cancer. Neutrophils.

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# PREVALENCE OF PD-L1 AMONG PATIENTS WITH METASTATIC TRIPLE-NEGATIVE METASTATIC BREAST CANCER (MTNBC) AND ITS ASSOCIATION WITH TUMOR-INFILTRATING LYMPHOCYTES (TIL)

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**Objective:** Immune checkpoint inhibitors (ICIs) combined with chemotherapy have emerged as the first line for patients with mTNBC whose tumors are PD-L1 positive. However, given the paucity of data in Brazilian populations, the objective of this study was to evaluate the prevalence of PD-L1 positive mTNBC in a single Brazilian center and its association with tumor-infiltrating lymphocytes (TIL). **Methods:** We assembled a retrospective cohort of all patients with metastatic breast cancer who have been tested for PD-L1 biomarker from January 2018 to December 2020. Patient's clinical information, including use of ICI, and PD-L1 status, was obtained from the electronic medical record's analysis, and the TIL slide's material was reviewed by a single pathologist. TIL were assessed according to the international consensus and were classified as low, intermediate, and high TIL, respectively, if they present with <10, 10–60, and >60%. Survival data (overall survival and progression-free survival) for TNBC patients who have been treated with immunotherapy are presented. **Results:** Among the 46 female patients tested for PD-L1 in our institution, 25 (54.4%) presented with mTNBC. Among this group (median age of 46 years), the majority was diagnosed between 2016 and 2020 (56%), in stages I or II (56%), and had invasive ductal carcinomas (96%). Most patients (23; 92%) underwent the SP-142 Ventana test, and the prevalence of positive (PD-L1 &#8805; 1%) patients was 40%. Samples from primary tumor were more likely to be PD-L1 positive (9/17; 53%) compared with samples from metastatic sites (1/8; 12.5%) tumors. A total of 19 patients had TIL assessment. Most cases presented with low TIL (n=14; 73.7%), followed by intermediate TIL (n=5; 26.3%), and no cases of high TIL. Patients with PD-L1 negative tumors were more likely to present tumors with low TIL (9/11; 81.8%) versus those with PD-L1 positive tumors (5/8; 62.5%). A total of 13 patients received ICI plus chemotherapy. For this subset of patients, the median age was 47 years, 69.3% (n=9) had PD-L1 positive tumors, and most of them (n=12) received atezolizumab plus nab-paclitaxel. Only one patient received ICI as the first line. The median PFS was 2.36 months (2.4 months for PD-L1+ and 2.01 months PD-L1–). Two patients received the combination of ICI plus chemotherapy for >6 months. Disease progression was the main reason (64%) for ICI interruption. Only one patient stopped therapy for toxicity (neuropathy). **Conclusion:** To the best of our knowledge, this is the first “real-world” Brazilian study evaluating the prevalence of PD-L1 positive mTNBC and its association with TIL. The prevalence of PD-L1 in mTNBC is consistent with scientific literature, and physicians should prioritize performing the test in samples from primary tumors

**Keywords:** Immunotherapy. Triple-negative breast cancer. PD-L1. TIL.

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# COMPARATIVE ANALYSIS OF THE DEGREE OF PATIENT SATISFACTION AFTER BREAST-CONSERVING SURGERY WITH OR WITHOUT ONCOPLASTIC SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Objective:** A systematic review was carried out on the comparative analysis of the degree of satisfaction of patients undergoing breast-conserving surgery for the treatment of breast cancer, with and without oncoplastic surgery, in addition to performing a meta-analysis to integrate the results of studies carried out with different questionnaires to arrive at a summary measure that could homogenize and categorize this complex comparative analysis arising from such diverse quantitative collection methods. **Methods:** Systematic review with literature searches in MEDLINE (by PubMed), EMBASE, ClinicalTrials, Scopus, Web of Science, BVS, and OpenGrey. The Joanna Briggs Institute tools were used to evaluate the methodological quality of the studies. Data were summarized through meta-analyses using a random effects model and considered relative risk (RR) measures and their confidence intervals (95%CI). **Results:** After eligibility assessment, we included 6 studies in the systematic review and in the quantitative analysis, encompassing a total of 1,110 patients. The studies included seemed to have an overall good methodological quality. There was no statistically significant difference in the aesthetic outcome between women who underwent oncoplastic and conservative surgery (RR=0.98; 95%CI 0.91–1.04). Patients undergoing conservative surgery with oncoplastic surgery have more advanced staging, greater tumor size, and resected specimen weight compared to classical surgery. In addition, a higher frequency of breast tumor location is unfavorable to the best aesthetic result (central, medial, or inferior). **Conclusion:** The degree of patient satisfaction with conservative surgery, with or without oncoplastic surgery, is similar between the groups. The time elapsed from the surgery to the measurement of the outcome, and the tumor conditions seem to have an impact on this result. There is no specific or standardized questionnaire to assess patient satisfaction with conservative surgery, bringing limited and controversial results. Standardization in the quantification of these data in further studies is suggested.

**Keywords:** Breast neoplasms. Mammoplasty. Mastectomy, segmental. Patient satisfaction.

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# TISSUE EXPANDER OR PERMANENT IMPLANT IN IMMEDIATE BREAST RECONSTRUCTION AFTER MASTECTOMY? A SYSTEMATIC REVIEW

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**Objective:** The aim of this study was to evaluate options for tissue expander and permanent implant and know the main indications, complications, effects on adjuvant treatment, impact on quality of life, and cost-effectiveness of each one.

**Methods:** A systematic review was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. For the identification of articles on the topic, PubMed, EMBASE, and Cochrane databases were searched from 2000 to 2021, and only English terms were used. The inclusion criteria were as follows: meta-analyses, systematic reviews, randomized or nonrandomized clinical trials, and observational studies. The analysis of the studies was descriptive. **Results:** The initial search in the databases identified 65 articles, and after reviewing the inclusion criteria, 32 studies were available. According to relevance, 20 studies were excluded due to unavailability of the full text or irrelevance for the study purpose. Twelve articles were included with an average of 1068 patients per study. The studies were heterogeneous with results mostly favorable for reconstruction at a stage with permanent implant. **Conclusion:** Single-stage breast reconstruction is a promising strategy with acceptable complication rates and the described advantages. Post-mastectomy radiotherapy increases complications. Finally, studies are still heterogeneous, both in terms of methodologies and results, so it is not possible to extrapolate information without bias.

**Keywords:** Mastectomy. Tissue expander. Reconstruction. Radiotherapy.

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# MULTI-CENTRE PROSPECTIVE EVALUATION OF NEGATIVE PRESSURE WOUND THERAPY (NPWT) IN PATIENTS UNDERGOING ONCOPLASTIC BREAST SURGERY

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**Objective:** Oncoplastic breast surgery is well-established but has a higher risk of wound complications. This may result in a delay in receiving adjuvant therapy, increased hospital visits with associated financial implications, and sub-optimal cosmetic outcomes. Negative pressure wound therapy (NPWT) has emerged as an additional tool to reduce wound complication rates, but further evaluation is required to evaluate its efficacy. This study investigated the prophylactic use of PICO® NPWT in patients undergoing oncoplastic breast surgery. We determined the rate of wound-related complications, including dehiscence, necrosis, implant loss, and infection. We compared our findings with data from the National Mastectomy and Breast Reconstruction Audit 2011 (NMBRA) and implant-based Breast Reconstruction Audit (iBRA). **Methods:** This was a prospective multi-centre national audit. The participating UK breast units routinely used NPWT for oncoplastic breast surgical procedures. Data collection included rates of wound dehiscence, wound necrosis, wound infection, and implant loss. The study findings were compared against the NMBRA and the iBRA studies. **Results:** Data from 267 patients were included in the study from 7 centres. The mean duration of PICO use was 6.6 [SD 1.9 days]. In all, 36 patients (13.5%) developed post-operative wound complications; 16 patients (6%) developed skin flap necrosis; wound dehiscence occurred in 13 patients (4.9%); and 15 patients (5.6%) developed post-operative wound infection. Of the whole cohort, 11 patients (4.1%) required further surgery due to wound complications, and 8 patients (3%) had a delay in the receipt of adjuvant therapy. A total of 158 patients underwent mastectomy with immediate implant-based breast reconstruction. The post-operative wound complication rate was comparable in this subgroup (n=22; 13.9%). Skin flap necrosis was seen in 10 patients (6.3%), wound dehiscence was seen in 7 patients (4.4%), and 8 patients (5.1%) developed wound infection. The implant loss rate was 3.8%. The estimated total cost savings were £84,613 and £316.90 per patient. **Conclusion:** This study suggests that prophylactic use of NPWT in oncoplastic breast surgery results in a low rate of wound-related complications with associated healthcare cost benefits. A prospective randomised controlled trial is required to further evaluate the prophylactic use of NPWT in oncoplastic breast surgery.

**Keywords:** Breast surgery. Implants. Complications. Negative pressure therapy.

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# VALIDATION OF A NOVEL IN VITRO BREAST CANCER CHEMORESISTANCE PLATFORM IN NEOADJUVANT SETTING

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**Objective:** The aim of this study was to validate a novel in vitro chemoresistance platform for two drugs commonly used in the neoadjuvant setting for breast cancer (BC). **Methods:** Three BC cell lines (MCF-7 (luminal); SKBR3 (HER2+); and MDA-MB-231 (triple-negative) were used to confirm the efficacy of the platform. Patients with invasive BC and partial response to neoadjuvant chemotherapy were included in this initial report. Fresh tumor samples were collected during surgery and dissociated to obtain the tumor cells. The tumor cells were cultured in the chemoresistance platform with doxorubicin and paclitaxel and after 72-h cell viability was evaluated. The test result is defined based on cell viability as low (<40%), medium (40–60%), and high (>60%) resistance. **Results:** The three BC cell lines presented low resistance to doxorubicin, MCF-7 and SKBR3 cells also presented low resistance to paclitaxel, whereas MDA-MB-231 has intermediate resistance. Samples from 10 BC patients with partial response to neoadjuvant chemotherapy were tested in the novel chemoresistance platform. All the patients received doxorubicin and paclitaxel as part of the treatment. The overall rate of assay success was 100%. Regarding molecular subtypes, 40% were Luminal, 20% Luminal HER2, 10% HER2, and 30% triple-negative. The 10 samples presented 100% high resistance to paclitaxel. High resistance to doxorubicin was observed in 70% of the samples, intermediate in 10%, and low in 20%. The chemoresistance platform demonstrated that samples already treated with paclitaxel and doxorubicin in a neoadjuvant setting presented more high resistance to the drugs compared to the BC cell lines. **Conclusion:** This preliminary result demonstrated more high resistance in tumors previously treated with doxorubicin and paclitaxel compared to BC cell lines without previous treatment and highlighted the success of the in vitro chemoresistance platform to test tumor samples after neoadjuvant treatment.

**Keywords:** Breast neoplasms. Neoadjuvant therapy. Neoplasm drug resistance.



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# DEEP LEARNING NEURAL NETWORK IMAGE ANALYSIS OF IMMUNOHISTOCHEMICAL PROTEIN EXPRESSION REVEALS A SIGNIFICANTLY REDUCED EXPRESSION OF BIGLYCAN IN BREAST CANCER

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**Objective:** The aim of this study was to compare the protein expression of biglycan (BGN) in normal breast tissue and in breast cancer using deep learning and digital HScore techniques. **Methods:** In this case-control study, 24 formalin-fixed, paraffin-embedded tissues were obtained from pathological archives for analysis. Normal breast (n=9) and breast cancer (n=15) tissue sections were analyzed by immunohistochemistry using BGN monoclonal antibody (M01 – Abnova), clone 4E1-1G7 at dilution 1:300 at pH 6, and 3,3'-diaminobenzidine (DAB) as the chromogen. Photomicrographs of the slides were analyzed using the ImageJ software with "color deconvolution". After selecting the regions of interest (ROI), deconvoluted panels with DAB only were quantified using arbitrary DAB units. Another set, with higher magnification without ROI selection, was submitted to the inception V3 deep neural network image embedding recognition model. Next, supervised neural network analysis, using stratified 20-fold cross-validation, with 200 hidden layers, ReLu activation, and regularization at  $\alpha=0.0001$  were applied for SDLNN. The sample size was calculated for a minimum of seven cases and seven controls, having a power of 90%, an  $\alpha$  error=5%, and a standard deviation of 20, to identify a decrease from the average of 40 DAB units (control) to 4 DAB units in cancer. Ethical approval was obtained from the Hospital de Clínicas de Porto Alegre Ethical Review Board (2019/0337). CAAE 15329119.9.0000.5327. **Results:** BGN expression (mean $\pm$ SD) was 6.1 $\pm$ 3.9 in breast cancer tissue, while in normal breast tissue, it was 39.6 $\pm$ 21.9, using D-HScore (p=0.0017, student t-test, Welch corrected). SDLNN was able to correctly classify 110 out of 129 photomicrographs of the dataset using DAB panels only, with a classification accuracy of 85.3% (95%CI 78.1–90.3%) and the area under the curve of 94.3%. **Conclusion:** D-HScore and SDLNN revealed that BGN protein expression is reduced in breast cancer tissue, compared to normal tissue. The use of SDLNN seems to be a potential tool for image analysis in histological samples.

**Keywords:** Breast cancer. Biglycan. Immunohistochemistry. Deep learning. Digital HScore.

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# INVESTIGATION OF CIRCULATING TUMOR DNA (CTDNA) IN PATIENTS WITH NON-METASTATIC TRIPLE-NEGATIVE BREAST CANCER (TNBC) SUBMITTED TO NEOADJUVANT CHEMOTHERAPY

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**Objective:** Loss-of-function germline mutation in BRCA1 increases breast cancer risk, especially in the triple-negative breast cancer (TNBC) subtype. BRCA1 impairment may confer benefit from the treatment with DNA damage-inducing drugs and PARP1 inhibitors. Patients who respond to neoadjuvant chemotherapy tend to have good outcomes. The aim of this study was to characterize the resistance to chemotherapy in patients with germline-characterized TNBC by investigating somatic mutations in ctDNA. **Methods:** Germline genetic testing was done using cancer-predisposing gene panels (26–126 genes) to classify TNBC as hereditary or sporadic. Somatic mutation identification in tumor (409 cancer-related gene panel) and screening of ctDNA in plasma samples during treatment were performed. **Results:** We enrolled 96 TNBC patients of which 88 were tested for germline variants: 23% (20/88) of cases were hereditary – BRCA1 (16%), BRCA2 (4%), PALB2 (1%), RAD51D (1%), and TP53 (1%). Tumor mutation burden (TMB) analysis (43 cases) showed that 11.6% had high and 89.4% had low TMB, not associated with hereditary status. We found, on average, 3 somatic variants per tumor (range 1–7) and used them as tumor marks for screening ctDNA in plasma. Somatic mutations in TP53 were identified in most tumors (71%). In ctDNA before treatment, detection of at least one tumor mutation was observed in 24 out of 30 patients (80%), and no association was observed between hereditary status and TMB score. Although ctDNA was not associated with the residual cancer burden score, ctDNA-positive patients were associated with clinical progression, either at baseline or during monitoring (post-neoadjuvant chemo), and ctDNA identification anticipated progression detected by imaging. **Conclusion:** Hereditary tumors, markedly due to germline variants in BRCA1, are frequent in TNBC. Tumor-mark identification using gene panels and ctDNA screening in plasma samples provide valuable information regarding the clinical progression of patients treated with preoperative chemotherapy.

**Keywords:** Hereditary. Triple-negative breast cancer. Circulating tumor DNA. Liquid biopsy.

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# MULTIGENE PANEL TESTING FOR BREAST CANCER PREDISPOSITION IN BRAZILIAN PATIENTS

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**Objective:** Only 5–10% of breast cancer (BC) is related to inherited genetic variants, and BRCA1 and BRCA2 mutations are responsible for the majority of cases. BRCA1 is more associated with triple-negative and BRCA2 to the luminal subtype. The contribution of other genes of high and moderate risk for BC, such as TP53, STK11, CDH1, PTEN, ATM, CHEK2, and PALB2, are not well defined, and risk estimates to specific BC subtype are lacking, especially for an admixed population like Brazilian. The aim of this study was to evaluate the contribution of the multigene panel in detecting germline mutations in Brazilian BC patients and their relationship with molecular subtypes and predominant ancestry. **Methods:** A 94-gene panel was performed on 321 patients with BC fulfilling NCCN criteria who were referred for BRCA1/2 testing between August 2016 and May 2018. Molecular subtypes were retrieved from medical records, and ancestry-specific variants were obtained from the sequencing data. **Results:** A panel analysis of 321 patients resulted in a total of 83 pathogenic/likely pathogenic (P/LP) variants identified in 81 patients, leading to a positivity rate of 25%. Of the total P/LP variants, 47% were identified in high-risk BC genes (BRCA1/2, PALB2, and TP53) and 17% in moderate-penetrance genes (ATM and CHEK2). The remainders of the variants were identified in low-risk genes and were considered unexpected findings. Variants of uncertain significance were identified in 77.6% of the patients. Regarding the molecular subtype, triple-negative BC had a mutation frequency of 32% (25/79), with predominance in BRCA1 (40%). Among the luminal subtype, 19% (29/155) had P/LP variants, with BRCA1/2 genes contributing to 38% of mutated cases. For the Luminal B HER2-positive subtype, 40% (16/40) had P/LP variants, with a predominance of the ATM gene (37%). Finally, the HER2-enriched subtype presented a mutation rate of 31% (4/13; 1 BRCA2 and 3 non-BRCA1/2). We did not detect any association of ancestry with P/LP variants or molecular subtypes. **Conclusion:** The multigene panel contributed to identify P/LP variants in other actionable genes besides BRCA1/2, increasing 7.2% of the positivity of the genetic test. Additionally, our results highlight the distinct contributions of BC genes in each molecular subtype. These results indicate that women with clinical criteria for hereditary BC may benefit from multigene panel testing as it allows them to identify P/LP variants in other BC susceptibility genes, including actionable genes, which directly impact the clinical management of these patients and family members.

**Keywords:** Hereditary breast cancer.

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# APPLICATION OF A REMOTE, FULLY ORIENTED PERSONALIZED PROGRAM OF PHYSICAL EXERCISE FOR WOMEN IN FOLLOW-UP AFTER BREAST CANCER TREATMENT: EFFECTS ON BODY COMPOSITION AND PHYSICAL FITNESS

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**Objective:** Getting back to regular physical activity soon after completing the treatment for breast cancer may be a challenge for most women. To assess the impact of physical exercise on physical fitness and body composition in women who have completed breast cancer treatment, we designed a personalized program of physical exercises, considering their individual basal physical activity levels. **Methods:** The prospective study included 107 women aged 18–60 years shortly after curative treatment for localized breast cancer. All participants were evaluated for cardiovascular morbidities, body composition, and exercise performance. After careful physical evaluation by a personal physical trainer, each woman was individually oriented on how to perform each exercise correctly and follow the program of nonsupervised exercises on their own at home, either indoor or outdoor. Women were motivated to adhere to personalized aerobic exercises, localized muscular strength/resistance, and flexibility exercises, considering individual capabilities and limitations. Evaluations including body composition, VO<sub>2</sub>max, and localized muscle resistance were performed preintervention (basal) and after 6 and 9 months of intervention. **Results:** Among all, 25.23% and 44.85% were fat or overweight, respectively, at the study entrance, and 21.49% reported doing physical exercise regularly; 78 women adhered to the training program (72.8%), and 29 chose not to adhere (27.2%). After 9 months of regular and individualized intervention, adherent women showed significantly better results in all variables of body composition and physical fitness: body mass ( $-4.38 \pm 3.67$  kg;  $p < 0.0001$ ), BMI ( $-1.62 \pm 1.53$  kg/m<sup>2</sup>;  $p < 0.0001$ ), fat percentage ( $-3.41 \pm 3.17\%$ ;  $p < 0.0001$ ); while in nonadherent women, the parameters did not change significantly: total mass ( $+2.83 \pm 3.21$  kg;  $p = 0.8277$ ), BMI ( $+1.16 \pm 1.24$  kg/m<sup>2</sup>;  $p = 0.8897$ ), and fat percentage ( $+1.77 \pm 2.73\%$ ;  $p = 0.05$ ). In particular, those women with binge eating disorders, who had the worst parameters at baseline (preintervention), obtained more noticeable results in reducing their body mass, BMI, and fat percentage ( $p < 0.05$ ). This favorable impact of exercise extended to all age groups and did not correlate with previous physical activity ( $p > 0.05$ ), as well as it was not influenced by breast cancer characteristics (e.g., histology, stage, and molecular subtypes) or treatment (e.g., mastectomy, axillary surgery, chemotherapy, or radiotherapy) ( $p > 0.05$ ). **Conclusion:** Our study reinforces that women in follow-up after breast cancer, regardless of body fatness or fitness, can adopt lifestyle measures to prevent a recurrence, and medical societies should include recommendations to promote physical activity early during surveillance.

**Keywords:** Physical activity. Breast cancer. Body composition. Lifestyle.

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# EARLY-ONSET BREAST CANCER PATIENTS FULFILLING HEREDITARY BREAST AND OVARY CANCER AND LI-FRAUMENI-LIKE SYNDROMES CAN HARBOR TP53 PATHOGENIC VARIANTS

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**Objective:** We investigate the prevalence of TP53 germline pathogenic variants in a cohort of 83 breast cancer patients and 217 family members from the Midwest Brazilian region. **Methods:** All patients met the clinical criteria for hereditary breast and ovarian cancer syndrome (HBOC) and were negative for BRCA1 and BRCA2 mutations. Moreover, 40 index patients fulfilled HBOC and the Li-Fraumeni-like syndromes (LFL) criteria. The samples were tested using next-generation sequencing for TP53. **Results:** Three patients harbored TP53 missense pathogenic variants (p.Arg248Gln, p.Arg337His, and p.Arg337Cys), confirmed by Sanger sequencing. One patient showed a large TP53 deletion (exons 2–11), which was also confirmed. The p.R337H variant was detected in only one patient. **Conclusion:** This study concluded that 4 out of 83 HBOC and LFL patients presented TP53 pathogenic variants at a young age. In contrast to other Brazilian regions, the TP53 p.R337H variant appeared with low prevalence.

**Keywords:** TP53. Breast cancer. Li-Fraumeni syndrome. Cancer predisposition.

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# COMPARISON OF FUNCTIONAL PERFORMANCE AND KINESIOPHOBIA BETWEEN BREAST CANCER SURVIVORS AND APPARENTLY HEALTHY WOMEN

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**Objective:** The aim of this study was to compare functional performance and kinesiophobia between breast cancer survivors and apparently healthy women. **Methods:** In all, 62 women participated the study and they were divided into a control group (CNT) (age: 52.16±7.59) composed of healthy women and breast cancer survivors (SCM) (age: 52.93±8.95). The functional performance was evaluated by the DASH and the kinesiophobia; it was evaluated by the Tampa Scale. The normality of the data was evaluated by the Shapiro-Wilk test. Data were analyzed by the Student's t-test. The significance level was defined a priori at p<0.05. The unpaired t-test was used to compare functional performance, and the Mann-Whitney U test was used to compare kinesiophobia. **Results:** The SCM group showed worse levels of functional performance (p<0.001) and higher levels kinesiophobia than the CNT group (p=0.05). **Conclusion:** SCM women have low levels of functional performance and higher levels of kinesiophobia

**Keywords:** Cancer. Functional capacity. Fear.

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# MIR-26A AND MIR-181C PROFILE HIGHLIGHT AS POTENTIAL PROGNOSIS BIOMARKERS IN TRIPLE-NEGATIVE BREAST CANCER PATIENTS

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**Objective:** This retrospective cohort study aims to investigate the relative expression profiles of microRNAs (miR 26a, 125b, 181a, 181c, and 340-5p) in patients with triple-negative breast cancer (TNBC) and their relationship with clinical outcome. **Methods:** We included 10 patients with TNBC, treated at the Mário Penna Institute, Brazil, and 5 patients without TNBC evidence, considered as control. This study was approved by the research ethics committee (CAAE protocol: 39741820.4.0000.9507). The total RNA extraction was performed from the formalin-fixed, paraffin-embedded (FFPE) tissues using the All Prep FFPE (Qiagen™). The RNA concentration was evaluated by the GE NanoVue Plus Spectrophotometer and complementary DNA (cDNA) for each target was synthesized, as appropriate. To analyze the transcripts, the TaqMan real-time PCR technique was used. The small nucleolar RNA RNU6-6P was used as an endogenous control. Changes in miRNA expression were measured by method  $2(-\Delta\Delta Cq)$ . **Results:** The expression profile of microRNAs showed a great variability among the TNBC patients, who reinforces the intratumoral heterogeneity of TNBC patients. One of 10 patients showed overexpression of all miRNA evaluated, while 2/10 had underexpression from all of them. An underexpressed profile of miR 181c and 26a was seen in those samples that had a tumor histopathological grade II (3/4) and the overall survival at 1–3 years. In contrast, the overexpression for both miRNAs was seen in 2/10 patients, independent of tumor histopathological grade, with the overall survival at 5–6 years. According to the literature, miR-26a and miR-181c suppressed the expression of MTDH and MAP4K4 genes, respectively, inhibiting the tumor-promoting effects in tumors. **Conclusion:** Our data appear to highlight the clinical evidence to use miRNAs as new prognosis biomarkers, allowing better stratification of patients. Studies are in progress to evaluate more patients and identify a molecular signature able to predict TNBC prognosis.

**Keywords:** Breast cancer. Biomarkers. MicroRNA. Triple-negative breast cancer.

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# DETERMINANTS OF SURVIVAL ON BRAZILIAN PATIENTS WITH BREAST CANCER IN PUBLIC AND PRIVATE PRACTICE

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**Objective:** The Brazilian health system can be divided into public and private sectors. In the public sector, insurance is provided by the state to all Brazilian citizens (municipal, state, and federal levels). The private sector is comprised of the private health insurance area, with various schemes of health plans or with out-of-pocket expenses. This study proposed to evaluate the breast cancer population characteristics and treatments according to public and private health care systems. **Methods:** This retrospective cohort study included patients diagnosed with invasive breast cancer, with health insurance information, between January 2000 and June 2020, from the Fundação Oncocentro de São Paulo database. Patients were described according to age, gender, level of education, histology of neoplasm, stage at diagnosis, and type of treatment. Categorical variables are described as percentages and frequencies. The association between demographic and treatment factors and overall survival (OS) was evaluated using a Cox proportional hazard (PH) regression model while accounting for different lengths of participant follow-up. Uni- and multivariable Cox PH models were used to estimate hazard ratios with corresponding 95% confidence intervals for OS. The Kaplan-Meier (KM) curves were used to visually display survival curves, and the log-rank test was used to compare the estimated KM curves. **Results:** A total of 65,543 patients were included. The distribution by age, gender, and histology was the same for public and private systems. The majority of patients were diagnosed on stages I and II (77.8%) in the private system. However, in the public system, it was found more advanced stage disease (67.8% in stages II and III). Patients with metastatic tumor were more common in the public system (11.1% versus 5.3%). Treatment with surgery and, at least, two types of adjuvant therapy as trimodal therapy were the same in both groups (46.6% private versus 46.2% public). KM plot shows 5- and 10-years OS differences in all stages; 10-year OS in stages I, II, III, and IV in private and public systems were, respectively, 81.6 versus 77.5%, 74 versus 63.3%, 55.6% versus 39.6%, and 7.6 versus 6.4%. In the multivariable analyses, the significant independent predictors for OS were private system, age and stage at diagnosis, high-level education, and trimodal therapy. **Conclusion:** Older patients, less intensive treatment, and lower educational levels were independent predictors for worse OS. Public health system presented a more advanced stage at diagnosis than private care and was associated with worse survival outcomes in Brazilian breast cancer patients.

**Keywords:** Public health system. Private health care. Breast cancer. Treatment. Prognosis.



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# EFFECT OF ACUPUNCTURE AND EXERCISE THERAPY ON MUSCULAR STRENGTH, LYMPHEDEMA, AND QUALITY OF LIFE IN BREAST CANCER SURVIVORS

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**Objective:** The aim of this study was to compare three distinct rehabilitation treatments (exercise therapy, acupuncture, and Stiper<sup>®</sup>) in women undergoing breast cancer surgery, assessing strength, lymphedema, and quality of life. **Methods:** In all, 79 women with pain above 3 on the visual analog pain scale (VAS) and with more than 90 days of surgery were included. They were divided into three groups that received weekly treatment for 10 weeks: group I (G1) treated with standard, predefined exercise therapy, based on stretching of the cervical muscles, shoulder girdle, and shoulder ROM exercises with a duration of 30 min; group II (G2) treated with 30 min of acupuncture using predefined points; and group III (G3) treated with the same acupuncture points as group II, however, using the Stiper<sup>®</sup> (silicon oxide micronized quartz pellet) in place of needles. **Results:** A total of 67 patients completed the treatment – 26 from G1, 23 from G2, and 18 from G3. There was an improvement in upper limb muscle strength over time in all groups, except for abduction and internal rotation movements. During treatment, there was no increase in the number of patients with lymphedema, and there was no statistical difference between the groups. Regarding the EORTC QLQ-C30 quality of life questionnaire, 9 of the 15 factors analyzed showed significant differences between sessions. The factors that did not have significant differences between the three groups were social function, nausea and vomiting, dyspnea, loss of appetite, constipation, and diarrhea. **Conclusion:** The rehabilitation of physical dysfunctions in women who survived breast cancer through exercise therapy, acupuncture, and Stiper<sup>®</sup> in upper limb muscle strength, lymphedema, and quality of life proved to be effective without superiority between groups, which leads to the conclusion that acupuncture showed equivalence of results when compared with exercise therapy, thus being an effective approach for the rehabilitation of these women.

**Keywords:** Breast cancer. Exercise therapy. Acupuncture. Muscle strength. Lymphedema. Quality of life.

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# THE IMPACT OF THE COVID-19 PANDEMIC ON THE PERFORMANCE OF MAMMOGRAPHIES IN THE BRAZILIAN NORTHEAST: AN ECOLOGICAL STUDY

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**Objective:** The aim of this study was to evaluate breast cancer screening according to demographic data, year of completion, age group, and geographic distribution in the pandemic period. **Methods:** An ecological study was carried out using data collected by the Departamento de Informática do Sistema Único de Saúde (DATASUS). The study population included patients who underwent screening for breast cancer in northeastern Brazil between 2019 and 2021. **Results:** The National Cancer Institute recommends biannual breast cancer screening through mammography for women aged 50–69 years. However, in 2020, the COVID-19 pandemic generated consequences such as the withdrawal of patients from health services, interfering with the performance of preventive mammography. In northeastern Brazil, 879,903 mammograms were performed on female patients in 2019, a number that was reduced by 39.23% in 2020 (534,647) and 5.68% in 2021 (829,902). A drop was also found in the number of examinations per target audience, especially in the year 2020 (40.36%) when compared to the year 2019, with the age group 50–54 years having the largest reduction, with a drop of 40.05%. It was found that between 2019 and 2020, all northeastern states had a drop in the number of examinations performed, with the largest drop being in Sergipe (52.54%). Despite this, in 2021, some states showed an increase in the number of examinations performed when compared to 2019, with Piauí standing out (50.54%). **Conclusion:** In the COVID-19 pandemic, there was a decrease in breast cancer screening between the years 2019 and 2020 in northeastern Brazil, with a discrete rise in the number of examinations performed in some states in 2021. The youngest age group of the target audience was the most negatively impacted. Thus, the need to use these data to formulate public policies to encourage screening and reduce morbidity and mortality from breast cancer is evident.

**Keywords:** Medical oncology. Mass screening. Breast neoplasms. Mammography. Brazil.

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# EVALUATION OF AN E-HEALTH PROGRAM: RESULTS IN THE EMOTIONAL WELL-BEING OF BRAZILIAN PATIENTS WITH BREAST CANCER

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**Objective:** The use of e-Health-based technologies has been boosted with COVID-19. This study evaluated the effectiveness of a program developed specifically for women with advanced breast cancer, users of the Unified Health System, in the course of outpatient chemotherapy. **Methods:** An e-Health program, called Conforto, was developed by a Brazilian group. Patients were followed up on a virtual platform and received psychosocial support via telehealth. In this longitudinal study, female patients diagnosed with locally advanced and metastatic breast cancers (IIIb, IIIc, and IV) undergoing outpatient chemotherapy were recruited. Symptom burden was assessed weekly and the EQ-5D-3L monthly in conjunction with the Perceived General Health (PSG) scale over 6 months with a 2-month follow-up. **Results:** A total of 71 patients were recruited; 71.8% (n=51) participated for at least 3 months and 39.4% (n=28) participated for 6 months. At baseline, patients had a higher burden of anxiety, distress, and insomnia. The results showed improvement in anxiety (p<0.001), distress (p<0.001), insomnia (p=0.03), sadness (p<0.001), and inappetence (p=0.01). PSG was significantly altered while remaining at follow-up (p=0.006). Most patients (70%), despite not having shown a history of symptoms to the attending physician, spoke with them about the symptoms. **Conclusion:** To date, this is the first study with e-Health technology developed for Brazilian cancer patients. Routine screening in the virtual modality and telephone service aimed at promoting self-management promotes emotional well-being even in an economically vulnerable population. Although being exploratory data, the findings suggest the effectiveness and feasibility of a sustainable intervention for women with locally advanced and metastatic breast cancers. The results facilitate access to supportive care and thus equity. For better results, it is necessary to include other professionals in the remote monitoring.

**Keywords:** Access to technological innovation. Telemedicine. e-Health. Comfort care. Psycho-oncology.

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# SOMATIC MUTATIONAL LANDSCAPE CHARACTERIZATION OF METASTATIC BREAST CANCER IN BRAZIL

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**Objective:** Breast cancer (BC) is the most common malignancy among Brazilian women after non-melanoma skin cancer. The mutational landscape of BC in Brazil is unknown. This study describes the mutational profile of a cohort of patients with metastatic breast cancer (MBC) who had undergone next-generation sequencing (NGS) using a comprehensive somatic tumor panel. **Methods:** We retrospectively reviewed medical records from MBC patients. The mutational profile, clinical, and demographic characteristics were abstracted. Furthermore, the patterns of ordering the panel and its usefulness for a clinical decision were evaluated. **Results:** We found 54 female patients who fulfilled the above criteria. The median age was 58 years (32–86). Most tumors tested were hormone receptor-positive (74%), followed by triple-negative (20.3%), hormone receptor-positive/HER2-positive (3.7%), and HER-2 positive (1.85%). The median time between the diagnosis of metastatic disease and the NGS execution was 40 months (0–112), and only three patients (5.5%) had not received systemic treatment prior to the test recommendation. Somatic mutations were identified in 94.4% (n=51) of the patients, mainly in PIK3CA (48.1%), TP53 (42.5%), and ESR1 (18.5%) genes. Tumor burden mutation (TMB) was informed in 61.1% (n=33) somatic panels, and 15.1% (n=5) had tumors with TMB  $\geq$ 10 mutations/megabase. Approved genome-driven cancer therapy was found in 54.9% (n=28), and eight patients (28.5%) received it. **Conclusion:** This study showed a high proportion of actionable somatic genomic alterations, and it reinforces the growing usefulness of a comprehensive NGS tumor somatic panel in managing patients with MBC.

**Keywords:** Breast cancer. Next-generation sequencing.

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# HEREDITARY BREAST CANCER IN THE PUBLIC HEALTH SYSTEM OF FEDERAL DISTRICT (DF) – BRAZIL

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**Objective:** The lack of financial resources challenges the inclusion of genetic testing in the Brazilian Public Health System. This study aims to describe the detection rate of germline pathogenic variants (GPVs) in patients at risk of hereditary breast cancer (BC) in the public hospitals of Brasilia, DF, as well as the clinical and demographic profile of patients (pts). **Methods:** Hereditary cancer risk assessment based on the National Comprehensive Cancer Network Criteria, version 1.2020 was performed on patients with a personal history of BC who were being followed in a public hospital (DF) between January 2021 and January 2022. **Results:** Among 217 female pts eligible for this study, 78 pts performed germline multigene panel testing out of pocket. Panels included 26–84 cancer susceptibility genes. Patients in this cohort were mainly from the center-west (46%) and northeast (31%) of Brazil. The median age of BC diagnosis was 42 years. Invasive ductal carcinoma represented 88% of the tumors. From a total of 78 BC, 52% were hormone receptor-positive, 23% HER2 positive, and 24% triple-negative. Most patients presented with locally advanced disease: 50% (n=39) IIB-IIIC and 8% (n=6) had metastatic disease. The detection rate of GPVs was 20% (n=16). Among these 16 patients, the most frequently mutated genes were BRCA1/2 (n=11, 68.5%) and TP53 (n=2, 12.5%). **Conclusion:** The overall detection rate of GPVs was similar to other worldwide studies. In comparison with other Brazilian studies, GPVs in TP53 were at lower rates, possibly because this cohort was enriched by patients from Brazilian center-west and northeast. Higher rates of advanced disease at BC diagnosis may impact treatment outcomes. The lack of access to genetic testing in the public health system takes away the opportunity for cancer prevention, more effective treatments, and proper family risk assessment.

**Keywords:** Hereditary breast cancer syndrome. Public health. Germline mutation.

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# FAT LOSS SOLUTIONS FOR OVERWEIGHT BREAST CANCER PATIENTS WITH SLEEP DISTURBANCES

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**Objective:** Obese breast cancer patients obtain lower pathological complete response rates and experience more neuropathy, anemia, fatigue, and depression during chemotherapy; have more surgical complications such as infection, seroma, implant loss, and lymphedema; more radiation dermatitis and esophagitis; lower disease-free survival and overall survival plus more grade 3 and 4 side effects under anti-HER2 treatments; lower Fulvestrant and Anastrozole efficacy; and more AET-related and Alpelisib side effects; the main impact coming from the fact that these are the main causes of treatment non-adherence and discontinuation. Due to the detrimental metabolic and behavioral impact, the quality of sleep is one of the important patient-related factors that needs to address when addressing obesity-related causes to improve oncologic outcomes. **Methods:** Seeking fat loss solutions for overweight ER+ breast cancer patients with sleep disturbances, we randomized 50 patients — of which 16 were depressive — to follow a high protein diet (D) or the diet and sleep journal interventions (D+SJ) for 8 weeks. Patients ate only when they were hungry, ate foods that were high in protein, calcium, omega-3, pre-, and probiotics, and wrote a daily food journal. Half of the patients were asked to write a 7-day SJ: the time it took them to fall asleep, the number of awakenings during the night, how much they slept, how much they stayed in bed, and self-perceived sleep quality. They were asked to set their sleeping and wake-up hours based on their SJ answers and to not sleep during the day. Eight patients from the D+SJ group left the study, five being depressive. We measured body composition with a bioelectrical impedance analysis scale. **Results:** The D group lost  $2.31 \pm 2.86\%$  of body fat ( $p=0.000$ ) and  $0.76 \pm 1.16\%$  of visceral fat ( $p=0.000$ ) with no differences between patients with or without depression. The D+SJ group improved sleep quality and lost  $2.16 \pm 2.35\%$  of body fat ( $p=0.002$ ) and  $0.86 \pm 1.24\%$  of visceral fat ( $p=0.005$ ); but depressive patients did not obtain statistically significant results, which may be because of the overtiring effect of the SJ intervention. So, both D and D+SJ interventions improve breast cancer patients' body composition despite sleep disturbances. **Conclusion:** SJ interventions improve sleep quality in patients without depression, thereby decreasing weight regain risk.

**Keywords:** Breast cancer. Obesity. Sleep wake disorders. Weight loss. Depression.

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# OPPORTUNISTIC MAMMOGRAPHIC SCREENING INDICATORS IN A DECADE IN THE STATE OF GOIÁS: TECHNICAL, SOCIAL, AND ECONOMIC CHARACTERISTICS

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**Objective:** The aim of this study was to evaluate indicators of opportunistic mammographic screening performed in the state of Goiás, according to technical, social, and economic aspects. **Methods:** Ecological study, where the Diagnostic Centers that performed mammography, were observed. Data were collected on the characteristics of the equipment, production, value, and sources of payment for the examinations. For the 2019 data, the following variables were analyzed: imaging technology, availability of mammography devices and estimated production, mammography expenditures, and mammographic coverage in the female population aged 40–69 years. The ratio of non-Unified Health System (SUS) and SUS examinations and the Composite Annual Growth Rate (CAGR) were also calculated to compare the indicators of opportunistic screening between 2008 and 2019. **Results:** In 2019, 164 mammography machines were identified, and of these, 66 met the SUS. This year, 400,896 examinations were produced at a cost of R\$41,931,120.00. The ratio of expenses between non-SUS and SUS care was 10.3, and the number of tests performed for non-SUS and SUS was 3.87. Opportunistic screening coverage was 69.8%, with the share of non-SUS services being 56.3% and SUS only 13.5%. When compared with the results of the 2008 study, a reduction in CAGR was observed: 16.3% for conventional mammography and 17% for digital mammography. The CAGR of the female population was 1.9%, and those aged 40–69 years showed an annual increase of 3.5%. There was an increase in the number of equipment used with a CAGR of 4.3% per year and an increase in the number of examinations of 2.5% per year; the CAGR of mammography coverage was -0.9% per year. **Conclusion:** The indicators show improvement in the technology park. The annual growth of the female population demonstrates an aging population, and the increase in the number of examinations was just enough to maintain mammography coverage.

**Keywords:** Breast cancer. Early detection. Mass screening. Mammography. Health services.

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# DIAGNOSIS OF BREAST CANCER IN BRAZIL: REFLECTION ON THE IMPACT OF THE COVID-19

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**Objective:** The objective of this study was to verify if the COVID-19 pandemic impacted the screening of breast cancer in women in Brazil. **Methods:** This is an observational, cross-sectional study with a descriptive and quantitative approach, carried out with secondary data provided by the Cancer Information System (SISCAN/DATASUS), considering two temporal clippings — before the pandemic (2015–2019) and during the pandemic (2020 and 2021). Women diagnosed with breast cancer who underwent mammography between 2015 and 2021 were included in the study. Review by the Research Ethics Committee was waived because public, aggregated, and unidentified data were used. **Results:** Between 2015 and 2021, 17,229,218 mammograms were performed in Brazil. The temporal analysis showed a gradual upward trend in all years, reaching 49.6% growth in the period before the pandemic (from 2,047,504 mammograms in 2015 to 3,063,618 mammograms in 2019). During the COVID-19 pandemic, there was a change in the Brazilian epidemiological behavior, as evidenced by a significant decrease in the number of examinations performed. In 2020, 1,864,891 mammograms were recorded, representing a 39.1% drop, while in 2021, 2,606,074 mammograms were recorded, representing a 39.7% increase over the previous year, but if compared to the last pre-pandemic year, there is an important decrease in the number of mammograms performed (14.9%). Besides this, another consequence was the underdiagnosis of some diseases, such as breast cancer. The estimate stipulated by the National Cancer Institute (INCA) for each year of the triennium between 2020 and 2022 was 66,280 new cases of breast cancer in Brazil. As with mammograms, in 2020, there was a 10.3% drop in diagnoses (n=46,509), which represent only 70.2% of the estimate made by INCA for 2020. In 2021, this drop was even more significant (n=24,446), representing only 36.9% of the expected for the period. **Conclusion:** Due to the emergence of COVID-19 and the magnitude of the pandemic, there was an epidemiological change in public health in Brazil, significantly impacting the screening, monitoring, and treatment of diseases with high incidence in the country. It is believed that this panorama will reflect in the increase of cases and their severity, besides impacting the costs of public health worldwide.

**Keywords:** Breast cancer. COVID-19. Overdiagnosis.



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# STANDARDIZATION OF THE FICOLL GRADIENT TECHNIQUE FOR THE ISOLATION OF MONONUCLEAR CELLS FROM PERIPHERAL BLOOD

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**Objective:** The objective of this study was to standardize the Ficoll gradient technique for the circulating hematopoietic stem cell (HSC) isolation for the assembly of the peripheral blood mononuclear cell (PBMC) biorepository of breast cancer (BC) patients attended in the Clinical Oncology Service of Instituto Mário Penna. **Methods:** The study protocol was approved by the Ethics Committee of Instituto Mário Penna (CAEE 82703418.8.0000.5121). In recommended protocols, 15 mL of blood was used. At first, we adapted this volume due to the limited amounts of samples for research available. Blood was collected in a 9-mL sodium heparin tube. The experiments were performed in 50-mL conical tubes, but with reduced blood volume, and no PBMC ring was formed. It was necessary to change to 15 mL conical tubes. Finally, the remaining red blood cells were lysed with ammonium chloride. However, with the reduced volume, this solution lysed the PBMC too. Then, we decided to remove this step from the protocol. **Results:** We obtained  $8.06 \times 10^6$  cells/mm<sup>3</sup> with 80% viability. Data were confirmed by a Neubauer camera and an automatic cell counter. The HSCs were labeled with antibodies against CD34 and CD133 by flow cytometry. **Conclusion:** The characterization of HSCs is important to link tumor-associated HSCs with malignant and immunosuppressive phenotypes. Studies are in progress with this standardization, and they will permit us to perform the HSC characterization of BC patients with a better knowledge of tumor microenvironment.

**Keywords:** Mononuclear cells. Hematopoietic stem cells. Ficoll.

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# EVALUATION OF CYP2D6 POLYMORPHISM IN PATIENTS WITH BREAST CANCER AND TAMOXIFEN USERS OF TWO BREAST SERVICES OF BELO HORIZONTE

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**Objective:** This study aimed to assess the CYP2D6\*4 polymorphism and the association of this polymorphism with the evolution of breast cancer since the reduction of the CYP2D6 activity due to polymorphisms of the gene that encodes the enzyme or the use of inhibitory drugs has been linked to reduced levels of endoxifen (EDF) and worse prognosis in women treated with tamoxifen (TAM). The treatment is multidisciplinary; TAM is an established and important therapeutic modality. This drug is metabolized by the CYP2D6 enzyme into its active metabolites, 4-hydroxytamoxifen (HTF), and EDF. **Methods:** The study was approved by the local ethical committee (CEP) and registered as CEP number 065/2009. This is a prospective study in which interviews were conducted by graduated mastologists with 138 patients with breast cancer treated with TAM in two public outpatient clinics. The inclusion criteria were invasive breast cancer diagnosis and use of the TAM as part of the treatment. Clinical data and blood samples were collected for CYP2D6 genotyping with the Restriction Fragment Length Polymorphism technique. The statistical analysis was conducted through the STATA 10.3 program. **Results:** We observed that 14.5% of patients had a recurrence and 30% of premenopausal patients had menstrual cycles. The average disease-free survival was  $43.6 \pm 45.7$  months, and the average overall survival was  $44.5 \pm 46.1$  months. Regarding the polymorphism, 81.15% were extensive metabolizers (\*1/\*1), 16.66% were intermediate metabolizers (\*1/\*4), and 2.17% were poor metabolizers (\*4/\*4). The data corroborate with the literature in relation to CYP2D6 polymorphism. **Conclusion:** Considering the high incidence of BC and the wide use of TAM in the treatment of this tumor, conducting research addressing the pharmacogenetics of TAM is of great importance to assess the impact of CYP2D6 polymorphisms in the adjuvant treatment of BC.

**Keywords:** Breast cancer. Polymorphism. CYP2D6. Tamoxifen.

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# TAMOXIFEN ADJUVANT INTERFERERS STUDY (TAIS STUDY): AN EXPLORATIVE ANALYSIS OF (Z)-ENDOXIFEN AND EARLY RECURRENCE OF BREAST CANCER IN A PROSPECTIVE BRAZILIAN STUDY

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**Objective:** Adherence to treatment and use of co-medication, molecular factors such as CYP2D6 genotype affect tamoxifen metabolism with consequences for early breast cancer (BC) prognosis. CYP2D6 polymorphisms have been promoted as potential biomarkers, yet they only partially explain the variability of plasma (Z)-endoxifen concentrations. The objective of this study was to evaluate whether plasma (Z)-endoxifen levels predicted early BC events (recurrence or death) within 5 years in patients receiving adjuvant tamoxifen treatment. The secondary aim was to evaluate whether (Z)-endoxifen levels were associated with clinical, pathological, and phenotypic CYP2D6 metabolism variables. **Methods:** In a prospective study on 149 tamoxifen-treated early-stage BC patients from Brazil followed up for 5 years, we investigated the association between the active tamoxifen metabolite (Z)-endoxifen at 3 months and event-free survival (EFS) adjusted for clinicopathological factors. We apply this approach to patients from a Brazilian prospective cohort (Tamoxifen Adjuvant Interferers Study) **Results:** In all, 25 (16.8%) patients had recurred or died at a median follow-up of 52.3 months. When we applied a putative 15 nM threshold used in previous independent studies, (Z)-endoxifen levels below the threshold showed an association with shorter EFS in an univariate analysis ( $p=0.045$ ) and after adjustment for stage (HR 2.52; 95%CI 1.13–5.65;  $p=0.024$ ). However, modeling of plasma concentrations with splines instead of dichotomization did not verify a significant association with EFS (univariate analysis:  $p=0.158$ ; adjusted for stage:  $p=0.117$ ). Hence, in this small exploratory study, the link between impaired tamoxifen metabolism and early BC recurrence could not be unanimously demonstrated. This inconsistency justifies larger modeling studies backed up by mechanistic pharmacodynamic analyses to shed new light on this suspected association and the stipulation of an appropriate predictive (Z)-endoxifen threshold. **Conclusion:** As expected, significant associations with CYP2D6 metabolism phenotypes were detected. In individual and grouped (PM+IM vs. NM+UM) comparisons, PM and IM phenotypes had lower median (Z)-endoxifen levels (7.7 and 16.3 nM, respectively) than patients with NM or UM phenotypes (27.6 and 38.0 nM, respectively;  $p<0.001$ ). Using a putative clinical threshold concentration of 15 nM, low plasma (Z)-endoxifen levels were associated with a higher rate of early recurrence or death events during follow-up.

**Keywords:** Tamoxifen. Breast cancer. CYP2D6. (Z)-endoxifen.

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# DOES THE BODY MASS INDEX (BMI) IMPACT THE OVERALL SURVIVAL (OS) OF BRAZILIAN WOMEN WITH BREAST CANCER (BC) WHO HAVE ACHIEVED PATHOLOGICAL COMPLETE RESPONSE (PCR) AFTER NEOADJUVANT CHEMOTHERAPY (NCT)?

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**Objective:** This study aimed to evaluate the impact of obesity on the survival of patients with breast cancer (BC) treated with neoadjuvant chemotherapy (NCT) in two public hospitals in Brazil. **Methods:** This is a retrospective, multicenter study that evaluates women with BC at Pérola Byington (HPB) and State Public Servant (HSPE) hospitals between January 2011 and May 2020. Stages I–III, age  $\geq 18$  years, and who underwent NCT were included. Patients were categorized by the World Health Organization definition as follows: body mass index (BMI)  $< 18.5$  kg/m<sup>2</sup>: malnutrition; 18.5 to  $< 25$  kg/m<sup>2</sup>: normal; 25 to  $< 30$  kg/m<sup>2</sup>: overweight;  $\geq 30$  kg/m<sup>2</sup>: obesity. Pathological complete response (pCR) was defined as the absence of invasive breast and axillary tumors. T-test or chi-square test was used to individually analyze the association of each variable between groups with and without pCR. Univariate and multivariate analyses were performed to calculate odds ratios, 95% confidence intervals of the independent variables BMI, age, and clinical stage, correlated with pCR with p-value  $< 0.05$  as statistically significant. **Results:** We enrolled 1779 patients, mean age of 50 years, and mean BMI of 28.08 kg/m<sup>2</sup>. Most of them were in stage III (68%) with ductal histological type (95.11%). After NCT, 1435 patients had residual disease and 344 patients had pCR. The BMI ratio was 1.57% malnutrition, 30.58% normal, 35.13% overweight, and 32.72% obese. When the pCR was associated with BMI, there was no significance on overall survival (OS) when evaluating separate centers (HPB: p=0.46, HSPE: p=0.49) or together (p=0.83). Disease-free survival was only possible in HPB without significance (p=0.83) for BMI. **Conclusion:** This Brazilian study showed no interference of BMI on OS in patients submitted to NCT with pCR. There were few patients achieving pCR (19.34%) probably because of the initial stage. Despite not having an impact on survival, most of our women were overweight or obese (72.85%), showing how obesity is common in Brazilian women and should be understood as a public health problem.

**Keywords:** Breast cancer. Neoadjuvant chemotherapy. Overweight. BMI.

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# NEOADJUVANT CHEMOTHERAPY OF BREAST CANCER WITHOUT FURTHER SURGICAL INTERVENTION

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**Objective:** Neoadjuvant chemotherapy (NCT) is an accepted treatment approach for locally advanced and some early-stage breast cancers. The development in systemic NCT in last few years has progressively increased pathological complete response (pCR). As a result, breast surgeons sometimes perform surgery on breasts that contain no tumor cells. This study sought to evaluate the survival outcomes for patients with clinical complete response (cCR) to NCT who did not undergo surgery. **Methods:** This retrospective study has been carried out at the Oncology Clinic of Azerbaijan Medical University. The study identified 108 women with a diagnosis of invasive breast cancer cT1-4, N0-3, and M0 tumors who received NCT between 2013 and 2018 and who did not have surgery. Overall survival (OS) was compared between the cCR group and no-cCR group of patients after NCT. **Results:** In patients who did not undergo surgery, 44 (40.7%) had cCR, 51 (47.2%) had a partial response, and 13 (12.0%) had no response/progression. The median age was 45.6, median tumor size was 51.2 mm, and immunohistochemistry were as follows: luminal 53 (49.1%), HER2+ 31 (28.7%), and triple-negative 24 (22.2%), with a follow-up of 48–108 months. The 5-year OS was better in the cCR group than in the no-cCR group (90.9% vs 61.5%;  $p=0.011$ ). **Conclusion:** To avoid surgery, it is critical to have the tools to accurately detect residual tumor disease and predict pCR after NCT. This study demonstrated that active surveillance or de-escalation therapy may be an option for patients who achieve cCR. Prospective studies are underway to determine whether a subgroup of patients may forgo surgery in the setting of cCR after NCT.

**Keywords:** Breast surgery. Neoadjuvant chemotherapy. Therapy.

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# ADHERENCE TO ADJUVANT ENDOCRINE THERAPY AND ITS DETERMINING FACTORS IN PATIENTS WITH BREAST CANCER

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**Objective:** This study aims to investigate the adherence rates to adjuvant hormone therapy in patients with early-stage breast cancer. **Methods:** Breast cancer patients with early invasive disease who are being treated with adjuvant hormone therapy for at least 6 months in a private oncology service were evaluated for adherence rates. Data collection was done using the RedCap software. The MMAS-8 scale was used to assess adherence to treatment, dividing patients into three groups as follows: low (<6 points), medium (6–8 points), or high adherence (8 points). Demographic and clinical characteristics were assessed for the three adherence groups. **Results:** From June to December 2021, a total of 60 patients were recruited. The median age was 60.3 years, and 23.3% were premenopause. About demographic statistics, 80% have a college degree, 35% live alone, and 30% have comorbidities. About breast cancer, 50% were in stage I, 50% received chemotherapy, 10% received HER2 blockade, and 26 patients (43.3%) used letrozole. Analyzing adherence, 45% had low/medium adhesion and 55% had high adhesion. There was no association between adherence rates and demographics, clinical and pathological characteristics, except for ECOG Performance Status (PS). All patients with PS ECOG 1 had low/medium adherence ( $p=0.036$ ). More patients who live alone had low or medium adherence, whereas more patients who live together had high adherence. There was no difference in the type of hormonal treatment and adherence. **Conclusion:** Preliminary results show high adherence in only 55% of patients, lower than reported in previous studies. This result draws attention because it can compromise survival. We will continue the recruitment of patients in the private service and start in the public service to assess the rate of adherence in a larger population and the relationship with demographic characteristics.

**Keywords:** Hormone therapy. Breast cancer. Medication adherence.

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# INFLUENCE OF COVID-19 ON BREAST CANCER DIAGNOSIS AND FOLLOW-UP IN BRAZIL

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**Objective:** The aim of this study was to verify the impact of the COVID-19 pandemic on the expected number of breast cancer diagnoses in Brazil. **Methods:** This is an observational, cross-sectional, analytical study conducted using secondary data collected from the Cancer Information System (SISCAN/DATASUS), analyzing two time slices (2020–2021 and 2021–2022). Women diagnosed with breast cancer who underwent mammography between 2020 and 2022 were included in the study. Research Ethics Committee review was waived because aggregated public data were used without identifying participants. **Results:** In the data collection conducted in 2021, it was possible to see underdiagnoses of breast cancer in the year 2020, when only 22,167 new cases were reported, when about 66,280 cases were expected. However, in 2022, with the update of the data in SISCAN/DATASUS, it was observed that in addition to underdiagnoses, there was a scenario of underreporting, since in 2022, the number of diagnoses was about 47,557 new cases of breast cancer in 2020 in Brazil. This scenario reflects the epidemiological health overload resulting from the pandemic, resulting in neglected attention to other diseases of high incidences, such as breast cancer. **Conclusion:** During the COVID-19 pandemic, a significant underreporting of breast cancer diagnoses was observed in Brazil, affecting epidemiological monitoring. It is believed that this scenario will reflect not only on the increase in severe cases of breast cancer but also on public health expenses.

**Keywords:** Breast cancer. COVID-19. Underregistration.

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# COMPARATIVE ANALYSIS BETWEEN SCREENING MAMMOGRAPHY PERFORMED IN PATIENTS AT USUAL RISK AND PATIENTS AT HIGH RISK FOR BREAST CANCER

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**Objective:** The aim of this study was to analyze the incidence of reports highly suggestive of malignancy in patients undergoing mammography in Brazil between 2013 and 2021. **Methods:** This is a retrospective and analytical cross-sectional study. A retrospective analysis of the reports available in the cancer information system (SISCAN) was performed, comparing the incidence of BI-RADS 4 (B4) and BI-RADS 5 (B5) reports between high-risk women (HRW) and women at risk (WAR) for breast cancer. Those women who registered in the system as high-risk with a positive family history or personal history of breast cancer were considered HRW. The B6 reports were excluded from the analysis since they are not a screening test but a follow-up test. **Results:** Of the total, 31,045 HRW had B4 on mammography, 76,329 WAR had B4 on mammography, 6,484 HRW had B5, and 12,757 WAR had B5. Using the SPSS Statistics software, the difference in proportion between them was calculated, and it was observed that being a WAR is a protective factor when compared to HRW for the diagnosis of B4, with the relative risk (RR) being 0.5412 (95%CI 0.5341–0.5483) for B4 and RR 0.433 (95%CI 0.4203–0.4462) for B5. The number needed to cause harm was also evaluated and showed that 203 (95%CI 198–209) mammograms with B4 in HRW are needed to diagnose a B4 in WAR and that 788 mammograms with B5 in HRW (95%CI 754–825) are needed to diagnose a B5 in WAR. **Conclusion:** This study showed an increased prevalence of reports suggestive of malignancy in high-risk patients when compared to usual-risk patients. Such findings may mean that high-risk patients have a higher prevalence of malignancy, but also that physicians analyze high-risk patient examinations more carefully, potentially increasing the rate of reports suggestive of malignancy in these patients.

**Keywords:** Mammography. Screening. Breast cancer.



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# VACUUM-ASSISTED EXCISION (VAE): A POTENTIALLY APPROACH FOR PERCUTANEOUS TREATMENT OF SMALL BREAST TUMORS

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**Objective:** The aim of this study was to evaluate vacuum-assisted excision (VAE) for percutaneous treatment of breast cancers. **Methods:** This is a retrospective analysis of 1061 vacuum-assisted biopsies (VAB) and VAE for the diagnostic purpose of suspicious breast lesions in a breast unit between April 13, 2017 and November 28, 2020. In total, 116 cases with complete data from VAB/VAE and surgical excision were evaluated. Excision following VAB/VAE was defined as complete resection (CR) if there was no residual tumor, minimal residual disease (MRD) if residual tumor was  $\leq 3$  mm, gross residual disease (GRD) if residual tumor was  $\geq 3$  mm, and upgrade from DCIS on VAB/VAE to invasive cancer. CR and MRD were combined as potentially resected and treated percutaneously (PRTP). The GRD and those with an upgrade to invasion were determined not suitable for percutaneous treatment. **Results:** The median age was 55.6 years (20–91; SD 12.27), and the median tumor size on imaging was 11.6 mm (4–88; SD 10.59). Of the 116 tumors, 29 (25%) were CR, 18 (15.5%) were MRD, 64 (55.2%) were GRD, and 5 (4.3%) were upgraded from DCIS to invasion. There were 47 (40.5%) tumors that were PRTP, of which 10 (21.3%) were DCIS and 37 (78.7%) were invasive diseases (12 pure invasive carcinoma [IC], 24 IC + DCIS, and 1 DCIS with microinvasion). In multivariate analysis, a VAE procedure ( $p=0.008$ , odds ratio [OR]: 4.4, 95%CI) with low/intermediate nuclear grade ( $p=0.000$ , OR: 12.5, 95%CI) and final  $T \leq 10$  mm ( $p=0.000$ , OR: 50.1, 95%CI) were associated with PRTP. In this retrospective analysis, the probability of PRTP of low/intermediate grade tumors smaller than 10 mm undergoing VAE was 84.58%. **Conclusion:** These data suggest that low/intermediate grade pT1a/b breast tumors can be completely excised with percutaneous VAE. Based on this, small ( $\leq 10$  mm) IC of low/intermediate grade could be considered for entry to prospective randomized trials of VAE for local treatment, with a long-term follow-up to assess recurrence rates. Standardization of the procedure should be recommended.

**Keywords:** Breast cancer. Percutaneous.

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# OBSTACLES FACED BY BREAST CANCER PATIENTS: FROM EARLY DIAGNOSIS TO TREATMENT DIAGNOSIS TO TREATMENT

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**Objective:** The objective of this study was to evaluate the factors that influence the early detection and initiation of treatment of patients with breast cancer. **Methods:** This is a cross-sectional, descriptive study, conducted between January and December 2020. A structured study was carried out with 102 patients from a tertiary service in the central region of Brazil. **Results:** There was a prevalence of women aged 41–60 years (66%), of brown ethnicity (56.9%), and who had completed elementary school (52.9%). In total, 58.8% of women sought the health service annually and 50.0% had never realized mammography (MMG) before the initial symptom, being “nodule” the most cited finding (80.4%). Among the difficulties faced in making the first appointment, fear of the diagnosis was the most cited (83.3%). MMG and biopsy were performed in 56.9% and less than 4 weeks in 56.9% of cases, respectively. In contrast, returns with the result of mammography and biopsy were 67.6% and 71.6%, respectively. In 77.5% of the cases, the specialist consultation after the biopsy occurred within less than 4 weeks and the beginning of treatment in 53.9% of the samples. As for the tumor characteristics, 61.8% of the patients had a positive axilla, 48.0% had tumor stage (G2), and 21.6% with IIIB staging. We observed a predominance of Luminal HER tumors (33.3%) and a mean Ki-67 of 33.46% ( $\pm 21.22$ ), with 8.8% of metastatic patients at diagnosis. **Conclusion:** In this sample of women users of the public health service, low awareness and low MMG coverage were observed, culminating in a higher prevalence of advanced stages at diagnosis. Confronting the obstacles related to the diagnosis and treatment of breast cancer can attenuate the socioeconomic differences and improve the oncological outcomes in this population.

**Keywords:** Breast neoplasms. Unified health system. Early cancer detection. Women’s health.

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# THE COVID-19 PANDEMIC AND LOSS OF BREAST RECONSTRUCTION SERVICES: HAS IT AFFECTED PATIENT QUALITY OF LIFE AND WELL-BEING?

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**Objective:** Breast reconstruction has better postoperative quality of life (QoL) outcomes compared to mastectomy. The COVID-19 pandemic led to restrictions across the National Health Service, including breast reconstruction services. Breast reconstruction was unavailable in the Aberdeen Royal Infirmary from March to September 2020. This study aims to determine how many patients were affected and how this restriction has impacted patients' physical, psychosocial, and sexual well-being. **Methods:** Patients who underwent mastectomy or breast reconstruction surgery in the Aberdeen Royal Infirmary from September 18, 2019 to September 18, 2020 were identified from admission lists. Breast-Q questionnaires were administered via post to all eligible individuals. Participants were asked if they would have preferred reconstruction had it been offered. QoL scores were compared between two groups: 1) patients who underwent breast reconstruction prior to the restriction of services and 2) patients who were not offered but would have preferred reconstruction. Data analysis was carried out using the SPSS statistical software. **Results:** In all, 164 patients underwent procedures during the period, of which 147 were eligible to participate. Of the 147 patients, 105 (71.4%) completed questionnaires were returned. Of those who had a procedure post-COVID-19 restrictions, 15 (27.8%) stated they would have preferred reconstruction had it been offered. Lower QoL scores were observed in group 2 compared to group 1 in both psychosocial well-being (medians 49 and 63, respectively,  $p=0.022$ ) and sexual well-being (medians 37.5 and 51.5, respectively,  $p=0.026$ ). **Conclusion:** The loss of breast reconstruction services affected 27.8% of patients. We demonstrate the negative impact this had on psychosocial and sexual well-being, which should inform decisions regarding service provision in the future.

**Keywords:** Breast reconstruction. Breast cancer. Quality of life.

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# A RETROSPECTIVE ANALYSIS OF 4,466 LUMINAL BREAST CANCER TREATED IN A REFERENCE CENTER

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**Objective:** The aim of this study was to evaluate HER2-negative estrogen receptor and or progesterone receptor positive and describe treatments and overall survival (OS) of patients treated in a reference center. **Methods:** We enrolled retrospectively 5,510 patients in Perola Byington's database from 2010 to 2021. After excluding patients without minimal complete records, a total of 4,855 were analyzed and clinical and pathological data were collected (date of diagnosis, first treatment, type of treatment, stage, type of surgery, disease-free survival, and OS). This study was approved by our ethics committee. **Results:** Most of our patients were diagnosed in stages I (26.9%) and II (38.2%). There was 23.4% in stage III, only 3.1% in stage IV, and 5.7% in stage 0, and in 2.6% the information was incomplete. The mean age at diagnosis was 57.6 years. We identified 4,761 (86.4% of 5,510) patients who underwent 4,848 surgical procedures. Of the total, 47.2% were mastectomies, 50.9% were sectorectomy, and 1.9% were adenectomy or adenomastectomy. Immediate reconstruction was done in 470 patients (69.8% underwent reconstruction with an expander, 22.3% with flap rotation and 7.9% with implants). The mean and median time between diagnosis and the beginning of treatment were analyzed; in the sample, it was observed that patients who were diagnosed in stages I, II, and IV had the same mean of 2.6 months, but stage IV had the lowest median 1.9 months. OS for patients diagnosed in stages I and II did not reach the median in the available period; for patients in stages III and IV, a median of 80.4 and 41.2 months of OS were identified, respectively. **Conclusion:** These are the first results of this large cohort of luminal patients treated in the public service of a referral center. Most patients are diagnosed in stage I or II and more than half undergo conservative surgery. Immediate reconstruction is not routinely performed. Stage III survival is 80.4 months and stage IV survival is 41.2 months in this analysis.

**Keywords:** Treatment. Survival.

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# OVERVIEW OF MAMMOGRAPHY IN GOIÁS BETWEEN 2016 AND 2021

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**Objective:** This study described the clinical-epidemiological characteristics of women undergoing mammography in the State of Goiás from 2016 to 2021. **Methods:** This is a cross-sectional, ecological study of women who underwent mammography between 2016 and 2021 in the state of Goiás. The DATASUS database of the Cancer Information System (SISCAN) was used, where age group, municipality of residence, and clinical indication were applied for analysis. **Results:** Between 2016 and 2021, in Goiás, 451,589 mammograms were performed on women aged 9 to over 79 years, with an average of 75,265 mammograms per year. In 2019, 89,868 procedures were performed, which was the highest number recorded in the analyzed period. In contrast, 2020 had lower demand, totaling 50,263 mammograms. As for the clinical indication, of the 365,152 requested mammograms, 354,370 aimed at screening, mainly for the high-risk population that includes women with a family history of breast cancer, representing 8,617 examinations. In addition, 13,853 mammograms had a diagnostic objective based on suspicious clinical findings, and 5,432 patients underwent mammography for previous treatment of breast cancer. The age group that most underwent mammograms was 50–54 years, totaling 17.3% of the total. In Goiânia, the rate of mammography performed, from 10 to 79 years old, was 4.8% and São João da Paraúna registered the highest rate with 20.5%. Goiânia, Aparecida de Goiás, and Anápolis lead the ranking of mammograms performed, representing 53% of the procedures performed in the state. **Conclusion:** Through the analysis, it is possible to infer that there is a disproportionate distribution of health resources in the territory of Goiás. In addition, the reduction in the number of mammograms in 2020 is correlated with the COVID-19 pandemic, allowing the loss of early diagnoses in many women, thus contributing to an unfavorable prognosis in the future.

**Keywords:** Mammographic. Breast. Woman.

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## BREAST CANCER TREATMENT DELAY-ASSOCIATED FACTORS IN NORTHERN MINAS GERAIS

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**Objective:** Delay in breast cancer treatment can lead to advanced stages of the disease and higher associated mortality. The north of Minas Gerais is a transition area between the southeast and northeast of the country, has a vast territorial extension, and has a great social need, where there have been no previous studies on breast cancer diagnosis and treatment delay. Thus, the objective of this study was to analyze the time elapsed between detection, diagnosis, and treatment in patients with breast cancer treated at a High Complexity Care Unit in Oncology (UNACON) in the north of Minas Gerais, identifying breast cancer treatment delay-associated factors. **Methods:** This is a retrospective cohort study that evaluated secondary data, analyzing the total interval (defined as the time elapsed from the first symptom or mammographic abnormality to treatment initiation) and associated factors for treatment delay in breast cancer patients at an oncology referral center in the north of Minas Gerais. A logistic regression model was used to define the associated factors, assuming a significance of up to 5% in the final model. In all, 300 medical records were analyzed between 2016 and 2018. All ethical precepts for conducting the research were respected. Data collection was authorized by the health institution. The research project was approved by the Research Ethics Committee of the State University of Montes Claros (n° 3.840.184/2020) as recommended by the guidelines of Resolution No. 466/2012 of the National Health Council of the Ministry of Health. **Results:** The median time of the total interval was 179.5 days, with 76.0% of patients presenting a delay in treatment initiation. The chances of delay in the total interval were greater in patients with lower education (odds ratio [OR]=2.01), with access to public cancer centers (OR=4.47), patients diagnosed by clinical examination (OR=2.24), and with brown and black skin color (OR=2.00). **Conclusion:** An important delay in treatment initiation for breast cancer patients was observed, and the associated variables highlight social inequalities. Therefore, it is recommended that more equitable strategies for women's health care be adopted in northern Minas Gerais.

**Keywords:** Breast neoplasms. Delayed diagnosis. Time-to-treatment. Mass screening. Health services accessibility.

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# FEATURES AND PROGNOSIS OF STAGES I–IV BREAST CANCER SUBTYPES AT THE CLINICAL HOSPITAL OF BOTUCATU MEDICAL SCHOOL – UNESP

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**Objective:** This study is proposed to assess the survival of patients with breast cancer according to the molecular classifications estimated by immunohistochemistry (IHC) and to evaluate the importance of Ki-67 proliferation index in the distinction of luminal subgroups and as a prognostic factor for Brazilian women with breast cancer in clinical stages I–IV. **Methods:** This is a retrospective, observational cohort study that included 842 patients with invasive breast cancer diagnosed between 2009 and 2016 who were treated at the Clinical Hospital of Botucatu Medical School – UNESP. Data collection was performed from June 2020 to May 2021 with the observation of a minimum survival time of 5 years and a maximum of 12 years. The study was approved by the institution’s ethics committee. Inclusion criteria were women with at least 18 years of age who were diagnosed with invasive breast carcinoma registered as new cases in stages I–IV between 2009 and 2016 and whose treatment was initiated at the Clinical Hospital of Botucatu Medical School – UNESP. Data were collected from electronic medical records and inserted into an Excel spreadsheet. After this evaluation, breast cancer was categorized into five molecular subtypes based on immunohistochemical profiles according to the following classification:

## 1- Luminal Ki-67 >10% Classification

“Luminal A”: ER positive, PR positive, HER2 negative and Ki-67  $\leq$ 10%

“Luminal B”: ER positive, PR positive or negative, HER2 negative and Ki-67 >10%

“Luminal B-HER2 positive (hybrid): ER positive, PR positive or negative, HER2 positive, any Ki-67 index

“HER2-enriched”: ER negative, PR negative and HER2 positive with any Ki-67 index

“Triple negative”: ER negative, PR negative, HER2 negative with any Ki-67 index

## 2- Luminal Ki-67 >20% Classification

“Luminal A”: ER positive, PR positive, HER2 negative and Ki-67  $\leq$ 20%

“Luminal B”: ER positive, PR positive or negative, HER2 negative and Ki-67 >20%

“Luminal B-HER2 positive (hybrid): ER positive, PR positive or negative, HER2 positive, any Ki-67 index

“HER2-enriched”: ER negative, PR negative and HER2 positive with any Ki-67 index

“Triple negative”: ER negative, PR negative, HER2 negative with any Ki-67 index

Another stratification using only Ki-67 index as reference was performed:

## 3- Ki-67 >10% Classification

Group 1: Ki-67  $\leq$ 10%

Group 2: Ki-67 >10%

After this evaluation, breast cancer was categorized into five molecular subtypes based on immunohistochemical profiles according to the following classification:

1- Luminal Ki-67 >10% Classification

“Luminal A”: ER positive, PR positive, HER2 negative and Ki-67  $\leq$ 10%

“Luminal B”: ER positive, PR positive or negative, HER2 negative and Ki-67 >10%

“Luminal B-HER2 positive (hybrid): ER positive, PR positive or negative, HER2 positive, any Ki-67 index

“HER2-enriched”: ER negative, PR negative and HER2 positive with any Ki-67 index

“Triple negative”: ER negative, PR negative, HER2 negative with any Ki-67 index

2- Luminal Ki-67 >20% Classification

“Luminal A”: ER positive, PR positive, HER2 negative and Ki-67  $\leq$ 20%

“Luminal B”: ER positive, PR positive or negative, HER2 negative and Ki-67 >20%

“Luminal B-HER2 positive (hybrid): ER positive, PR positive or negative, HER2 positive, any Ki-67 index

“HER2-enriched”: ER negative, PR negative and HER2 positive with any Ki-67 index

“Triple negative”: ER negative, PR negative, HER2 negative with any Ki-67 index

Another stratification using only Ki-67 index as reference was performed:

3- Ki-67 >10% Classification

Group 1: Ki-67  $\leq$ 10%

Group 2: Ki-67 >10%

After this evaluation, breast cancer was categorized into five molecular subtypes based on immunohistochemical profiles according to the following classification:

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“Luminal A”: ER positive, PR positive, HER2 negative and Ki-67  $\leq$ 10%

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“Luminal B-HER2 positive (hybrid): ER positive, PR positive or negative, HER2 positive, any Ki-67 index

“HER2-enriched”: ER negative, PR negative and HER2 positive with any Ki-67 index

“Triple negative”: ER negative, PR negative, HER2 negative with any Ki-67 index

2- Luminal Ki-67 >20% Classification

“Luminal A”: ER positive, PR positive, HER2 negative and Ki-67  $\leq$ 20%

“Luminal B”: ER positive, PR positive or negative, HER2 negative and Ki-67 >20%

“Luminal B-HER2 positive (hybrid): ER positive, PR positive or negative, HER2 positive, any Ki-67 index

“HER2-enriched”: ER negative, PR negative and HER2 positive with any Ki-67 index

“Triple negative”: ER negative, PR negative, HER2 negative with any Ki-67 index

Another stratification using only Ki-67 index as reference was performed:

3- Ki-67 >10% Classification



Group 1: Ki-67  $\leq$ 10%

Group 2: Ki-67 >10%

4- Ki-67 >20% Classification

Group 1: Ki-67  $\leq$ 20%

Group 2: Ki-67 >20%

Statistical analysis

Initially, a descriptive analysis was performed with the calculation of mean and standard deviation for continuous variables and frequencies and percentages for categorized variables. The primary outcome was overall survival (OS) and the secondary outcome was cancer-specific survival (CSS). OS was defined as the time interval between the date of diagnosis and the date of death (related to breast cancer or death from any cause). CSS was defined as the time interval between the date of diagnosis and the date of death related to breast cancer. Follow-up data were collected between October 2020 and May 2021. To calculate survival outcomes, the Kaplan-Meier estimator was used, followed by the log-rank test and the Sidak test for comparison between groups. A Cox proportional hazard model was used to analyze the association between different subgroups and survival. The chi-square test was used to study the association of variables and to compare proportions. A level of significance of 5% or the corresponding p-value was adopted in all tests. The analyses were performed using the Statistical Analysis System 9.4 program. **Results:** A total of 842 patients with breast cancer were included in the study. Clinical features are shown in Table 1. The mean age was 56.4 years, 35.9% of patients were 50 years or younger, and 64.3% were postmenopausal. Most patients (60.9%) had only elementary education and 14.3% had a higher education level. Nulliparous women accounted for 9.5% of cases and 26.1% of patients had a first- or second-degree family history of breast or ovarian cancer.

Considering the anatomical staging, most cases (63%) were in stage I or II and 6.9% in stage IV. Histological grade 3 was observed in 39.4% of the cancers and 73.4% of the patients had ER positive tumors, 62.4% PR-positive tumors, and 21.2% HER2-positive tumors. Luminal (HER2-negative) subtypes accounted for 47.2% of cases, followed by TN (15.2%), Luminal B-HER2 positive (14.1%), and HER2-enriched (7.3%). As for the Ki-67 proliferation index, in 24.5% of cases it was  $\leq$ 10%, and in 42.8% of cases it was >20%. Conservative surgical treatment was performed in 47% of cases and mastectomy with immediate reconstruction in 13.4% of patients. Most patients underwent systemic chemotherapy (76.9%) and radiation therapy (82.7%). It was observed that, regardless of the subgroup, most patients were in stage II. With regard to Ki-67 index, 84.9% of patients with Ki-67  $\leq$ 10% were in stages I and II and 38.1% of patients with Ki-67 >20% were in stages III and IV. TN tumors accounted for 47.7% of cases in patients younger than 40 years, 23.4% of tumors between 40 and 50 years, and 15.2% of tumors in patients older than 50 years of age. Luminal subtypes accounted for 30.1% of tumors in patients younger than 40 years, 45.6% of tumors between 40 and 50 years, and 59.7% of tumors in patient older than 50 years of age. Considering Ki-67, 75.8% of patients younger than 40 years had the index greater than 20% and only 13.4% had a Ki-67  $\leq$ 10%. Between 40 and 50 years, 62.6% of patients had a Ki-67 >20% and 23.1% had a level  $\leq$ 10%. In patients older than 50 years, Ki-67 was higher than 20% in 46.4% and  $\leq$ 10% in 37.8% of cases. Luminal A tumors (regardless of the Ki-67 cutoff value) had the lowest rates of chemotherapy, in which one-third of patients with this subtype did not undergo chemotherapy. Patients with triple-negative and luminal B (Ki-67 >20%) tumors were the groups that mostly underwent systemic cytotoxic treatment (89% of the patients). Patients with a Ki-67  $\leq$ 10% did not undergo chemotherapy in one-third of cases, whereas 91.8% of patients with Ki-67 >20% underwent systemic treatment. When assessing the type of surgery according to tumor subtype, mastectomy was more performed in the HER2-enriched group, corresponding to 41.9% of the surgeries performed in this tumor subtype. As for conservative surgery, it was more frequently performed in the Luminal A (Ki-67  $\leq$ 20%) group, corresponding to 58.2% of the cases of surgery in this subtype. The group with the highest percentage of reconstruction was the Luminal B-HER2 positive, in which the mastectomy followed by reconstruction corresponded to 20.3% of cases. The survival rate was 94.4% in stage I, 85.2% in stage II, 64.7% in stage III, and 19.6% in stage IV. OS was 78.2%. A better survival was observed in the Luminal A subgroup (88.9%), regardless of the Ki-67

cutoff value (10% or 20%), and a worse survival was observed in the triple-negative subgroup (60.5%). In Figures 3 and 4, survival curves of the patients according to the Ki-67 index are shown. Worse survival rates were observed in the groups with a higher Ki-67 index, both in those groups with a Ki-67 >10% and >20%. **Conclusion:** Our study is in accordance with some findings of the AMAZONA study. A higher percentage of breast cancer diagnoses in the population under 50 years of age and a lower percentage of initial breast cancer were observed in our study when compared to data from high-income countries. We also observed that survival was related to staging as shown in previous studies from developed countries. Another finding was that classification of breast tumors by IHQ reflects different survival curves between Luminal A, hybrid, HER2-enriched, and TN groups regardless of the Ki-67 level. Although we were unable to establish a cutoff value that would separate survival rates between luminal groups, Ki-67 had an independent prognostic value, and high values of this marker were associated with a greater use of chemotherapy.

**Keywords:** Breast cancer. Ki-67. Survival. Molecular.

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# FREE NIPPLE GRAFT: CURRENT INDICATIONS AND APPLICATIONS OF A CENTENARY BREAST SURGERY TECHNIQUE – A LITERATURE REVIEW

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**Objective:** This literature review seeks to provide an updated synthesis of knowledge about the free nipple graft (FNG) technique and its outcomes relating to aesthetic satisfaction, functionality, and safety profile, as well as to analyze its incorporation and applicability in several intervention areas involved in mastology such as mammaplasty, transgender, and oncoplastic surgery. **Methods:** A structured electronic literature search was conducted, using the PubMed and LILACS databases. The search strategy consisted of the keywords, MeSH terms, and free text words for the FNG and its application in mammaplasty, transgender, and oncoplastic surgery. **Results:** A total of 397 articles were found and after inclusion and exclusion criteria, 15 were selected. Their outcomes have shown, despite the lack of standardized scores to postulate better scientific evidence on its use and indications, that the technique, analyzed in over 1290 patients, achieved high-safety rates and reproducibility. Aesthetic and patient satisfaction were positives and recommended by the authors in different studies discussed in this study. Despite these considerations regarding methodological and article limitations, it is important to emphasize a broad applicability of the FNG technique and its limited dissemination and use in breast surgery. Notwithstanding inconveniences related to the FNG technique, such as total loss of nipple sensibility, areolar depigmentation, and flattening of the papilla over time, it is also necessary to reinforce the low rate of loss of graft. Moreover, in cases of oncological surgeries, in which maintaining NAC would not be possible after mastectomy in ptotic or bulky breasts, FNG may be used for the maintenance of the nipple-areolar complex or correction of malposition of it after conservative or radical mastectomies. **Conclusion:** The literature data analysis provides a broad view of possibilities in breast surgery using the FNG technique and its safety profile. This study represents a potential impact on both experienced and learner surgeons when providing the most complete and updated information about a technique with a large spectrum of intervention in either mammaplasty, oncological, or transgender surgery. Still, we reinforce the need for adequate interventional trials and standardized aesthetic functional scores in order to define with a better level of evidence the usefulness of FNG.

**Keywords:** Mammaplasty. Transgender. Breast neoplasms.

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# INFLUENCE OF THE TYPE OF CRITERIA USED FOR CLASSIFICATION OF THE BEST STUDIES IN MEDICAL EVENTS

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**Objective:** The aim of this study was to evaluate the impact of the study methodology and the type of evaluation in the selection of studies for presentation of Scientific Events. **Methods:** This is a prospective, observational, transversal study, applied in a cohort of studies submitted for presentation at BBCS 2021. This study does not require CEP evaluation by resolution 466/2012. All BBCS 2021 Evaluating Committee members were invited to participate in the study. The studies were presented blindly to the evaluators, with three forms of evaluation being presented. The first criterion was based on six criteria (method, ethics, design, originality, promotion, and social contributions), representing the pattern of the event. In the second criterion, the evaluator considered a grade from 0 to 10 for the study. The third criterion was based on five criteria (presentation, method, originality, scientific, and social contributions). The results were grouped and the studies classified. For evaluation of the correlation of the criteria of the items, the Cronbach's alpha was performed. A factorial analysis was performed. For evaluation of the median differences between the tests, we used Kruskal-Wallis and post hoc Dunn's tests. To evaluate the difference in the study classifications, we used the Friedman test and Nemenyi's All-Pairs Comparisons. The "R" and IBM SPSS Statistics were used for the analysis. **Results:** In all, 122 studies were evaluated, of which 94 were original studies and 28 were case reports. Five professors performed all the evaluations. Original studies had better scores. There was a good correlation with the items of criteria 1 ( $\alpha=0.730$ ) and 3 ( $\alpha=0.937$ ). The methodology and study design showed the main criteria needed for study evaluation. The Kruskal-Wallis showed differences in the results ( $p<0.001$ ) of all criteria used [1–2 ( $p<0.001$ ); 1–3 ( $p<0.001$ ); 2–3 ( $p=0.004$ )]. The Friedman test showed a difference in the ranking of the studies ( $p<0.001$ ), for all studies ( $p<0.01$ ). **Conclusion:** Methodologies that use many criteria showed good correlation. Methodology and study design represent the main criteria. The methodology used in the evaluation of studies influences the ranking of the best studies.

**Keywords:** Breast. Scientific society. Methods. Evaluation indexes.

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# CHARACTERIZATION OF CHRONIC PAIN IN WOMEN SUBMITTED TO BREAST CANCER TREATMENT

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**Objective:** The aim of this study was to characterize chronic pain in women undergoing surgical treatment for breast cancer. **Methods:** This is a cross-sectional, retrospective, hospital-based study. All breast cancer patients undergoing clinical follow-up at a referral hospital in central Brazil were screened. Women with chronic pain after surgical treatment of breast cancer, defined by the presence of pain after 3 months of surgery, were included in the study. The questionnaires were applied by the responsible researcher in the form of an interview, which took place in a dedicated office. The McGill Pain Questionnaire (MPQ) and the visual analog scale (VAS) were used. **Results:** In all, 99 patients were interviewed, of which 46 were included in the study. Most patients were between 50 and 59 years old (39.1%), were married (45.7%), were housewives (58.7%), and had completed high school (45.7%). Arterial hypertension was the most prevalent clinical comorbidity (41.3%), followed by diabetes mellitus (13.0%). A total of 45 (97.8%) patients underwent sentinel lymph node biopsy, but 22 (47.8%) required axillary lymphadenectomy for some oncological reason; 35 (76.0%) patients underwent chemotherapy (neoadjuvant or adjuvant), and 40 underwent radiotherapy (87.0%). According to the VAS, the mean pain intensity was 5.5 ( $\pm 2.6$ ). Most patients reported worsening pain with movement, with 26 (52.2%) “sometimes”, and another 14 (30.4%) “always”. In the MPQ, there was a predominance of the sensory domain among the characteristics of chronic pain. Relaxation techniques (52.2%), stretching (50.0%) and deep breathing (47.8%) were the most mentioned therapeutic measures. Drug treatment was reported by 21 (45.7%) women and acupuncture by only one. **Conclusion:** In the analyzed population, chronic pain was observed with moderate intensity and with a predominance of sensitive characteristics according to the MPQ. The development of strategies for prevention, early diagnosis, and multidisciplinary treatment can help reduce chronic pain in breast cancer survivors.

**Keywords:** Breast cancer. Breast-conserving surgery. Mastectomy. Adjuvant radiotherapy. Chronic pain.

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# SCREENING MAMMOGRAPHY BEFORE AND DURING THE COVID-19 PANDEMICS IN BRAZIL: AN ANALYSIS FROM PUBLIC REGISTRIES

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**Objective:** The goal of this study was to evaluate the impact of the COVID-19 pandemic on breast cancer screening in the public health system in Brazil. The Brazilian Ministry of Health recommends mammography screening every 2 years from 50 to 69 years of age. **Methods:** This is a cross-sectional study based on data from the Brazilian Institute of Geography and Statistics and the System of Health Information of the public health system (DATASUS). We evaluated the absolute number of screening mammograms performed per age group every year from 2017 to 2021. The year 2017 was considered the reference. **Results:** In 2017, a total of 2,616,022 screening mammograms were performed through the Brazilian public health system in women 50–69 years of age, in comparison to 1,456,001 (44.34% fewer) in 2020 and 1,998,097 (23.62% fewer) in 2021. The expected number of examinations, considering the target population in 2021, would be 8.5 million. In addition, in 2018, there were 3.8% and in 2019, 5.4% fewer examinations than in 2017. Of note, the target population increased by 10% from 2017 to 2021. Regarding other age groups, the proportion of mammograms performed remained similar over the period: 65% of the examinations were performed in the recommended range, 29.5% between 35 and 49 years, and 5.5% in patients older than 70 years. **Conclusion:** There was a large (44.34%) decrease in the number of screening mammograms in 2020 in comparison to that in 2017. However, in the years before the pandemic (2018 and 2019), the proportion of women who underwent screening was also smaller than in 2017. More studies are needed to evaluate social and political factors associated with the low proportion of screening mammograms and yearly fluctuations in breast cancer screening through the public health system in Brazil.

**Keywords:** Breast cancer. Screening. Mammography. COVID-19. Brazil. Indicators. Health care.

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# EVALUATION OF MALIGNANCY UNDERESTIMATION IN BREAST PAPILLARY LESIONS DIAGNOSED AT PERCUTANEOUS BIOPSY IN A SOUTH BRAZILIAN ANATOMOPATHOLOGICAL LABORATORY CENTER

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**Objective:** The aim of this study was to discover the percentage of patients who underwent surgery due to a biopsy with a diagnosis of papillary lesion and who had their diagnosis underestimated for cancer, analyzing the biopsy data and comparing it with the post-surgical results in the past 10 years. **Methods:** Anatomopathological examinations of percutaneous core-type or vacuum breast biopsy between 2010 and 2020 with a result of the papillary lesion were analyzed and compared with the anatomopathological result obtained surgically. Cases in which the biopsy already demonstrated malignancy were excluded. The data were from the CEDAP (Centro de Diagnósticos Anátomo-Patológicos) pathological anatomy laboratory database in Joinville, Santa Catarina. **Results:** In the reported period, 126 biopsies were recorded with a diagnosis of breast papillary lesion. Of these, 21 were excluded because they did not meet the established criteria. In the follow-up examinations of the papillary lesions after surgery, 76 (72.4%) corresponded to benign lesions, including 30 cases demonstrating atypia, and 29 (27.6%) to carcinomas, of which 14 corresponded to invasive lesions and 15 *in situ* carcinomas. **Conclusion:** Papillary breast lesions are a diagnostic challenge in a biopsy, requiring sequential surgical excision, even though this practice is being questioned nowadays, due to the high risk of underestimation.

**Keywords:** Breast. Papillary. Malignant. Needle biopsy.

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# ACCESS TO BREAST CANCER TREATMENT ASSOCIATED WITH SOCIODEMOGRAPHIC AND LIFESTYLE CHARACTERISTICS

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**Objective:** There is evidence in the literature that patients from the Public System who enter the hospital seeking treatment for breast cancer differ from those from the Supplementary Health System. An investigation of the association of access to treatment — public or supplementary — of invasive breast cancer with sociodemographic characteristics and lifestyle becomes important in view of the scarcity of research in mixed populations such as the Brazilian one. **Methods:** This cross-sectional study performed the association of the form of access to treatment for invasive breast cancer with sociodemographic characteristics and lifestyle in 583 patients seen in a cancer center in southeastern Brazil. The Pearson's chi-square test or Fisher's exact test was used for statistical analysis. **Results:** The average age of this research was 52.3 years. We found an association of access to treatment with a higher proportion of women 50 years or older in the Public System ( $p=0.008$ ); the Public System showed a higher frequency of women with marital cohabitation ( $p<0.001$ ); supplementary health had higher education ( $p<0.001$ ); there was a higher frequency of white women in Supplementary Health ( $p<0.001$ ); higher frequency of smokers and former smokers in the Public System ( $p=0.003$ ); higher frequency of alcohol consumption currently and in the past in Supplementary Health ( $p=0.008$ ); first mammogram performed before 40 years in the Public System ( $p<0.001$ ); greater agility in performing the last mammogram in the Supplementary System ( $p<0.001$ ); higher frequency of family history of breast cancer in the Public System ( $p<0.001$ ); and higher proportion of women with three children or more in the Public System ( $p<0.001$ ). **Conclusion:** This research identified that patients treated by the Public System present greater social vulnerability when compared to women in the Supplementary System.

**Keywords:** Breast cancer. Access to treatment.



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## PALLIATIVE CARE: A MULTIPROFESSIONAL APPROACH IN PATIENTS WITH BREAST CANCER

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**Objective:** The aim of this study was to describe the importance of the multidisciplinary team in the management of pain in patients with breast cancer under palliative care. **Methods:** This is a qualitative literature review based on the analysis of studies available in the databases “SciELO”, “PubMed”, and Google Scholar platform. Aspects such as the particular needs of different patients, the views, and participation of the various health professionals involved in the treatment as well as the patients’ family network and affinities and their perceptions of the benefits of such an approach were considered. The descriptors used were the terms “Palliative Care”, “Breast Cancer”, and “Multidisciplinary Team”. Studies published between 2018 and 2022 and available in Portuguese or English were selected. **Results:** Among the materials analyzed, it is evident that palliative care for breast cancer should include a multiprofessional team, which aims to meet most of the individual’s needs. In addition, it can be observed that the insertion of this approach into the treatment of the patient improves adherence and awareness about the disease, thus interfering in the improvement of physical and psychosocial symptoms, resulting in an improvement in the quality of life of the patient. However, the lack of knowledge of patients and families about palliative care causes late and unplanned referrals. **Conclusion:** It is found that breast cancer is a multifaceted disease that covers several dimensions that make up the biopsychosocial being. Consequently, care must be prepared by a multidisciplinary team in order to improve adherence to treatment and education about the disease and, finally, care for the patient in its entirety, reducing their suffering.

**Keywords:** Breast cancer. Palliative care. Patient care team.

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# IS THERE ANY DIFFERENCE IN LOCOREGIONAL RECURRENCES AFTER CONSERVING BREAST SURGERY IN PATIENTS OVER 70 YEARS OLD COMPARED WITH PATIENT BELOW?

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**Objective:** The aim of the study was to assess whether the type of surgical treatment has an impact on local recurrence and overall survival (OS) of patients aged 70 years or older when compared to patients below 70 years of age. **Methods:** This is a retrospective case-control study. Data were collected from the medical records of all female patients undergoing surgical treatment for breast cancer at the Hospital do Servidor Público Estadual de São Paulo (HSPE) between March 2014 and October 2020. Female patients with a diagnosis of malignant neoplasm of the breast confirmed by the pathological anatomy exam and submitted to surgical treatment at some stage of the follow-up (1,120 patients) were included in the study. Patients whose medical records did not present complete data (37) and the presence of metastasis at diagnosis (6) were excluded. The final sample contained 1,077 patients. For continuous variables, the mean and standard deviation were calculated; for categorical variables, frequency and percentage were calculated. To compare the variables of interest by age group, the chi-square test was used. When necessary, the Fisher's exact test or the likelihood ratio test was used. To compare OS, relapse-free survival, and metastasis-free survival by age group, the log rank (Mantel-Cox) test was used, and when necessary, the Breslow test was used. The curves were fitted by Kaplan-Meier. A significance level of 5% was used ( $p$ -value $<0.05$ ). **Results:** Local recurrences occurred in 61 patients (5.7%) with a mean time of 24 months after diagnosis, and 120 (11.2%) patients had distant metastasis at a mean time of 23 months. There were 96 deaths (8.9%), of which 73 were from neoplastic causes (78.5%) on average 30 months after diagnosis. The mean follow-up time was 47 months, the overall survival was 45 months, and the disease-free survival was 43 months. Patients were divided into groups aged up to 69 years (G1) and 70 years or older (G2). G1 was composed of 808 (75%) patients and G2 of 269 (25%) patients. The comparative analysis of the groups showed a statistically significant difference in specific clinical stages: G1 had more clinical stage IIIA and G2 had IIA and IIIB. There was no statistically significant difference in estrogen receptor, progesterone receptor, and HER2 positivity; however, G1 had a higher Ki-67 mean ( $p<0.05$ ). There was a statistically significant difference in the indication of breast-conserving surgery with patients from G1 being more frequently submitted to this type of treatment. There was no significant difference in the variables of recurrent local (RL), metastasis, and their respective times. Among the patients who underwent breast-conserving surgery, there was no statistically significant difference in RL and metastasis; however, the patients in G1 who underwent breast-conserving surgery relapsed in a shorter time than those in G2: 28×39 months –  $p<0.05$ . There was no difference between the groups regarding disease-free survival; however, the OS was higher among patients in G1 ( $p<0.05$ ). **Conclusion:** This study presented data that showed no statistically significant difference in locoregional recurrence rates between patients under 70 years of age and patients aged 70 years and above. Those, however, had higher OS.

**Keywords:** Breast cancer. Local recurrences. Elderly.

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## ANALYSIS OF THE R337H VARIANT IN THE TP53 GENE IN A GROUP OF PREMENOPAUSAL WOMEN WITH BREAST CANCER FROM THE CENTRAL-WESTERN REGION OF BRAZIL: A PILOT STUDY

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**Objective:** The aim of this study was to investigate the frequency of the R337H variant in the TP53 gene in a group of premenopausal women with breast cancer from the central-western region of Brazil and its possible associations with clinical, pathological, and prognostic aspects. **Methods:** The research comprised a pilot study of 36 patients with breast carcinomas diagnosed before the age of 50, selected from the records of the Laboratory of Immunohistochemistry, Department of Pathology, Hospital Araújo Jorge, in Goiânia (GO). DNA extraction was performed with QIAamp DNA FFPE Advanced (Qiagen, Germany) and the R337H variant was investigated in 36 patients using the polymerase chain reaction-restriction fragment length polymorphism method. **Results:** Among 36 samples of breast cancer diagnosed in premenopausal women, 3 were positive for the R337H variant in the TP53 gene (8.3%). Furthermore, all three patients presented a very diverse phenotypic heterogeneity. **Conclusion:** Carriers of the R337H variant are no longer limited to the south and southwestern regions of Brazil and might be further investigated in a larger population of premenopausal breast cancer patients from the central-western region of Brazil.

**Keywords:** Breast cancer. Prognosis. Premenopausal. Germline mutation. TP53 gene.

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# ANALYSIS OF TUMOR RESPONSE IN THE BREAST AND AXILLA ACCORDING TO MOLECULAR SUBTYPE IN BREAST CANCER PATIENTS SUBMITTED TO NEOADJUVANT CHEMOTHERAPY

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**Objective:** Pathological complete response rate (pCR), ypT0/is ypN0, after neoadjuvant chemotherapy (NAC) varies in each molecular subtype of breast cancer, being lower in hormone receptor-positive (HR+) tumors. The objective of this study is to analyze the pathological response rate (PR) only in the breast, only in the axilla or the pCR, correlating with the molecular subtypes. **Methods:** This is a retrospective observational study of stage II and III patients undergoing NAC between 2013 and 2020 at the Oncology and Mastology Service of Santa Casa de Misericórdia de Belo Horizonte – MG (SCMBH). This study was approved by the Research Ethics Committee of SCMBH with the number 3,787,212 complying with Resolution 196/96 of the National Council for Ethics in Research. **Results:** In all, 209 patients were selected with a mean age of 50.6 years; 22.0% were T2, 35.9% were T3, and 42.1% were T4; 17.2% were pre-NAC cN0 and 82.7% were cN+. Patients were divided into group A, RH+, with 147 patients (70.3%), and group B, HER2+ and TN, with 62 patients (29.7%). When comparing PR only in the breast, RH+ patients had a better result (4.8% versus 1.6%); as well as PR only in the axilla, 37.4% against 29.0%. When subdividing group A into RH+/HER2- and RH+/HER2+, the former presented better results in the breast (4.3% X 0%) and in the axilla (60.9% X 55.6%). **Conclusion:** Achieving pCR is not the only goal of NAC. Other benefits include the possibility of breast and axilla-conserving surgery. The study demonstrated good PR results in both the breast and the axilla in group A and in the RH+/HER2- subgroup. These responses allow for a less morbid surgical treatment, both aesthetically and because of the risk of lymphedema. The data presented provide a compelling rationale for the use of NAC in a molecular subtype considered to be relatively resistant to chemotherapy.

**Keywords:** Breast cancer. Neoadjuvant chemotherapy.

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## MAMMOGRAPHIC SCREENING COVERAGE IN ELDERLY WOMEN IN BRAZIL

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**Objective:** The aim of this study was to assess trends in breast cancer screening in the Unified Health System (SUS) in women over 70 years of age, during 2010–2021, and to assess the frequency of malignant lesions in this group, from 2014 to 2021. **Methods:** This is an ecological study on breast cancer screening in elderly women in the SUS in Brazil from 2010 to 2021. Data were extracted from the Outpatient Information System of the SUS Informatics Department and the Cancer Information System. Coverage was calculated from the ratio between the number of mammograms performed and the number expected for the population at risk. **Results:** We observed that in Brazil there was an average mammographic coverage of 6.7% in this age group. The south region had the highest coverage with an average of 8.9% for the period, while the north region had the lowest rate of 3.1%. Among the states, São Paulo and Paraná, with 9.9% and 9.6% respectively, had the highest rates. There was a reduction in the coverage rate in the analyzed period, more pronounced in 2020–2021 due to the COVID-19 pandemic, caused by the reduction in the active demand of women for health treatment in this context. The number of examinations with a diagnosis of the malignant lesion followed a pattern and increased until 2019, followed by a decrease in 2020, due to COVID-19 and an increasing trend in 2021. The total number of examinations in the analyzed period was 13,090, an increase of 1,604% compared to 2014. The states that showed most participation in these results were São Paulo (16%), Minas Gerais (16%), Paraná (14%), and Pernambuco (13%). **Conclusion:** The number of breast cancer cases in elderly women has increased, but screening has not followed this trend. It is necessary to rethink the assistance to this age group, discussing public health measures that address this reality.

**Keywords:** Breast cancer. Elderly. Screening programs. Mammography. National health service.

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# ASSESSMENT OF WEIGHT AND ITS RELATIONSHIP WITH BREAST CANCER IN A CLINICAL ONCOLOGY SERVICE IN THE FEDERAL DISTRICT

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**Objective:** The purpose of this study was to analyze the relationship between obesity and clinical outcomes in breast cancer patients by evaluating the mean body mass index (BMI) and overall survival. **Methods:** This is a retrospective observational and descriptive study without intervention, carried out in a public oncology service in the Federal District. We selected breast cancer patients with hormonal expression positivity in follow-up from January 2016 to December 2020. **Results:** In all, 305 female patients were evaluated, aged between 33 and 92 years with a median age of 59 years. Most patients were over 55 years of age (63.3%). The mean weight of the patients was 71.70±9.10 kg. Regarding BMI, 38.7% of patients were classified as obese. As for the immunohistochemical (IHC) classification, 72.9% of the patients were Luminal B. Among the patients in whom the initial treatment was registered, 56.1% received hormone therapy, while 43.9% received chemotherapy. The intention to treat in most patients was curative. Most patients had disease staging between II and III. As for the outcome, most patients were still undergoing treatment (83.0%) at the time of data collection. Correlating the IHC classification with patient survival, there was no significant difference between patients classified as luminal A and those classified as luminal B (p=0.342). There was also no significant difference between non-obese and obese patients in the assessment of overall survival and weight (p=0.917). **Conclusion:** Despite the high prevalence of obesity in the studied population, the overall survival of this group did not differ from the non-obese group, even in the analysis by IHC profile.

**Keywords:** Breast cancer. Body mass index. Survival.

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# IMMUNOPHENOTYPING OF BREAST CANCER ASSOCIATED WITH MALIGNANT TUMOR CLASSIFICATION AND HISTOPATHOLOGICAL FEATURES

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**Objective:** The immunohistochemical profile of breast cancer is based on the evaluation of estrogen and progesterone receptors, HER2 expression, and cell proliferation index. An investigation of the association of immunophenotyping with the classification of tumors and the description of their anatomical extent becomes important in view of the scarcity of research in mixed populations such as the Brazilian. Thus, this research performed the association of immunophenotyping — luminal A, luminal B HER2-negative, luminal B HER2-positive, HER2-positive, and triple-negative — with the classification of malignant tumors and histopathological characteristics in patients with breast cancer seen in a cancer center in southeastern Brazil. **Methods:** This is a cross-sectional study with 583 female patients with invasive breast cancer in whom Pearson's chi-square test or Fisher's exact test was used for statistical analysis. **Results:** There was a higher frequency of women with the luminal B HER2-negative subtype (33.9%). Analysis of immunophenotyping with clinical characteristics found a higher frequency of clinical stage I in luminal A, 40% ( $p < 0.001$ ); pathological stage I in luminal A, 45% ( $p < 0.001$ ); invasive ductal carcinoma morphology in HER2-positive, 97.4% ( $p < 0.001$ ); histological grade G3 in triple-negative, 66.3% ( $p < 0.001$ ); nuclear grade 3 in HER2-positive, 87.2% ( $p < 0.001$ ); and e-cadherin positive in HER2-positive luminal B, 81.8% ( $p < 0.001$ ). **Conclusion:** There was a significant rate of pathological primary tumor T0 in the triple-negative (21.7%), which highlighted the advance of therapy in this subtype hitherto known to be of worse prognosis. Contrary to expectations, the molecular subtype that showed the most metastasis was luminal B-positive (10.8%). We observed that in the population analyzed, immunophenotyping showed an association with clinical and histopathological characteristics. The more severe molecular subtypes presented a more advanced stage.

**Keywords:** Breast cancer. Tumor biomarkers. Molecular biology.

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# THE INFLUENCE OF PHYSICAL EXERCISE AS INTEGRATIVE, COMPLEMENTARY PRACTICE ON PATIENTS WITH BREAST CANCER DIAGNOSTIC: A LITERATURE REVIEW

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**Objective:** The aim of this study was to evaluate the influence of physical exercise as an alternative to integrative and complementary practices and its importance in patients diagnosed with breast cancer. **Methods:** This is a literature review that was carried out in the PubMed and SciELO databases, in which the articles were searched using the following terms: breast cancer, physical exercise, quality of life, and nonpharmacological treatment, selected between the period of 2017 and 2022. The types of study selected for research were experimental and observational. **Results:** A study carried out with 28 patients was divided into an experimental group (combined and hospital treatment) and a control group (hospital treatment), where it was concluded that the combined treatment (aerobic, resistance, and flexibility exercise) led to an increase in the frequency of physical activity. Physical exercise in patients with breast cancer provides better cardiorespiratory and joint control. In another study that was carried out with 10 women who survived breast cancer, for 4 months, with the practice of combined physical exercises, it was evidenced that remotely supervised non-face-to-face aerobic and resistance exercises can help maintain the level of fatigue positively. These results corroborate the perception of professionals from the Family Health Strategy, who observed the positive effects of complementary integrative practices (PICS) through the suffering and fragility in the treatment of women with breast cancer, acting on an emotional and spiritual improvement for them, which makes these practices relevant adjunct to conventional treatment in primary care. **Conclusion:** Physical exercise as an integrative practice can improve asthenia, assist in cardiorespiratory and joint control, and aid in the management of fatigue. Therefore, PICS provides emotional, physical, and spiritual benefits for patients diagnosed with breast cancer.

**Keywords:** Breast cancer. Physical exercise. Quality of life. PICS.



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# MACROSCOPIC EVALUATION OF THE PATHOLOGICAL MARGIN IN PATIENTS WITH BREAST CANCER DURING BREAST-CONSERVING SURGERY

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**Objective:** Nearly 1/5 of women with breast cancer (BC) treated by breast-conserving surgery (BCS) require reoperation due to positive margins on final pathology. In our hospital practice, intraoperative macroscopic pathological margin evaluation (IMPME) of all lumpectomy specimens is routine. The objectives of the study were to assess the accuracy of the IMPME in a large study population of BC patients treated by BCS. **Methods:** Patients treated by BCS from 2015 to 2017 for invasive BC were included in a retrospective analysis. The diagnostic accuracy of IMPME in predicting margin involvement was calculated by determining its sensitivity (Se), specificity (Sp), negative predictive value (NPV), and false-negative rate (FNR). **Results:** In all, 543 women with 562 BCS were analyzed. There were 30 (5.5%) patients with multiple BC tumors and 17 (3.1%) patients with bilateral BC. Among them, 460 (81.7%) were invasive ductal carcinomas and 79 (14%) invasive lobular carcinomas. According to intrinsic subtype classification, 504 (89.7%) were luminal tumors, 44 (7.8%) were triple-negative tumors, and 14 (2.7%) were HER2-enriched breast tumors. The mean pathological tumor size was 12.2 mm (range: 1.5–40 mm). With a cutoff value of  $\leq 1$  mm for positive margin status with IMPME, the Se, Sp, NPV, and FNR were 65.9% (29/44), 66% (342/518), 95.8% (342/357), and 4% (15/357), respectively. There were 34.2% (192/562) BCS with intraoperative re-excision after IMPME examination. The secondary re-excision rate for final positive margins after BCS was 6.6% (37/562). **Conclusion:** In this study population, IMPME is not sensitive and specific enough to discriminate between negative and positive margins during BCS. Nevertheless, its NPV seems sufficiently accurate to exclude the presence of residual breast tumor tissue on the surgical specimen of patients treated with BCS, which represents an effective technique for evaluating the intraoperative margin in BC patients.

**Keywords:** Breast-conserving surgery.

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# SYSTEMIC TREATMENT FOR EARLY-STAGE TRIPLE-NEGATIVE BREAST CANCER: A RECOMMENDATION FROM AN EXPERT PANEL OF THE BRAZILIAN SOCIETY OF MASTOLOGY

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**Objective:** The aim of this study was to assess the knowledge and attitudes of members of the Brazilian Society of Mastology (SBM) about the systemic treatment of triple-negative breast cancer (TNBC). **Methods:** All 1,400 SBM members were invited to answer a survey with 44 objective questions. An expert meeting was held in December 2021, with the participation of 27 experts and 3 ad hoc consultants. Panelists responded to the survey before and after the meeting (brainstorm). Responses that reached 70% agreement were considered consensual. **Results:** There was consensus regarding the indications of neoadjuvant chemotherapy and the addition of platinum in this context, unlike immunotherapy, which was only recommended among experts after brainstorming. The presence of germline BRCA mutations does not interfere with the recommendation of neoadjuvant treatment with immunotherapy (double consensus). In contrast, 70.6% of mastologists consider the status of PD-L1 for the indication of neoadjuvant immunotherapy. Faced with the combination of chemotherapy and neoadjuvant immunotherapy, about 75% of respondents recommend that anthracyclines be used in a dose-dense regimen (double consensus). After the brainstorm, this agreement was reversed. In adjuvant therapy, controversies remain regarding the maintenance of immunotherapy and the combination of immunotherapy and capecitabine/olaparib in relevant cases. **Conclusion:** Consensus among experts was reached on more than 70% of the questions, and agreement between panelists and associates was moderate. As verified in the brainstorm, the educational intervention about the systemic treatment of breast cancer influenced the mastologist's decision-making in 60% of the questions. This theme should be explored, intensively and systematically, in continuing education actions aimed at mastologist professionals.

**Keywords:** Breast neoplasms. Triple-negative breast neoplasms. Consensus development conferences as topic.

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# EVALUATION OF THE CLINICAL PARAMETERS OF A GROUP OF PATIENTS WITH TRIPLE-NEGATIVE BREAST TUMORS

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**Objective:** This study aims to evaluate the prevalence of triple-negative breast cancer (TNBC) in breast cancer patients treated at the Mastology Service of the Hospital das Clínicas – Federal University of Minas Gerais (HC-UFMG/EBSERH) and to analyze other clinical parameters in this population, such as age, clinical stage at the first consultation, and family history (FH) for cancer. To describe the systemic treatment, the surgical approach and the pattern of response after neoadjuvant chemotherapy were used. **Methods:** A retrospective cohort study was carried out with the analysis of 337 patients treated at the Mastology Service of HC-UFMG with TNBC. The study was approved by the National and Institutional Research Ethics Committee. **Results:** Of the 337 patients analyzed, 45 (13.35%) had TNBC. The median age of the patients was 51 years, the minimum age was 24 years, and the maximum age was 77 years. Clinical staging at the first consultation corresponded mostly to stage IIIA (46%), followed by 15% in stage IA and 12% in stage IIB. The positive FH for cancer in a first-degree relative was 52%. In addition to mastectomy, performed in 50% of patients, axillary lymphadenectomy was added in 70% of cases and sentinel lymph node biopsy in the remaining 30%. Of the patients who underwent conservative treatment, 50% underwent axillary lymphadenectomy and 50% underwent sentinel lymph node biopsy. Only 5% did not undergo chemotherapy (early stages). Fifty-nine percent underwent neoadjuvant chemotherapy, fulfilling the indication criteria authorized by the Unified Health System. Pathological complete response was achieved in 32% of patients. **Conclusion:** The incidences found in the population with TNBC assisted by the mastology service of the HC-UFMG are similar to those found in the world population. The 45 (13.35%) patients in the study with TNBC are mostly (58%) in advanced clinical stage with positive FH (52%).

**Keywords:** Breast cancer. Triple-negative. Epidemiology. Treatment.

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## CLINICOPATHOLOGICAL FEATURES ASSOCIATED WITH THE PROGNOSIS OF YOUNG WOMEN WITH BREAST CANCER IN BRAZIL

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**Objective:** The aim of this study was to investigate the clinical-pathological features and the prognosis of premenopausal breast cancer patients, stratified by three age groups (below 33 years, 34–36 years, and 37–49 years). **Methods:** This is a retrospective study including 206 patients with breast carcinomas diagnosed before the age of 50 years, selected from the records of the Laboratory of Immunohistochemistry, Department of Pathology, Hospital Araújo Jorge, in Goiânia (GO). **Results:** Patients' age at diagnosis ranged from 21 to 49 years, and the mean age was 34 years ( $\pm 4.3$ ). The 5-year overall survival for the group was 61.8%. Younger patients, diagnosed before 32 years, presented a worse prognosis (52.3%), compared to other age groups ( $p=0.049$ ). Younger patients also presented a higher percentage of T4 tumors (33.3%) ( $p=0.045$ ) and advanced stages of the disease (III–IV) (79.1%) ( $p=0.007$ ). **Conclusion:** The clinicopathological and immunohistochemical characteristics of patients diagnosed with breast cancer before the age of 50 years were associated with low overall survival. In addition, patients diagnosed before 32 years of age presented with more aggressive tumor characteristics and worse prognosis when compared to other age groups.

**Keywords:** Breast cancer. Prognosis. Premenopausal. Young. Brazil.

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## CONDUCTING BREAST CANCER RESEARCH DURING A PANDEMIC ISOLATION TIME

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**Objective:** Aiming at the assistance of women with breast cancer, quality of life indicators can help in clinical practice, guide therapeutic intervention strategies, and evaluate the success of intervention after surgery and cancer treatment, in addition to defining parameters for actions. This perspective study is about the quality of life of patients treated for breast cancer at the Institution. However, as soon as the pandemic started, the need to readapt the way of filling out the questionnaires to an online model emerged. Our objective is to share the facilities and difficulties of online model research.

**Methods:** Through the selection of patients for research that aimed to analyze the quality of life of patients with breast cancer, they were contacted by their registered e-mails in the institution system. Each patient received an explanation of the project through e-mail and the Free and Informed Consent Term (TCLE). After agreement, the survey link of the REDCap system directing the selected instrument to be filled in was sent. The analysis included a general questionnaire composed of demographic and clinical aspects (collected by electronic medical record data) and specific questionnaires. **Results:** In all, 477 e-mails were sent, 52 patients signed the TCLE (but 2 did not answer the research), 36 answered the questionnaires completely, and 14 incompletely. A total of 12 e-mails were returned (wrong e-mail address). **Conclusion:** During the pandemic period, new tools were incorporated in order to obtain data and maintain research. Moving to an online way brought the chance to keep studies, giving new possibilities to answer research remotely, but difficulties were added to this new kind of research. E-mail data, lack of explanation face-to-face, and the number of complete responses mainly in long questionnaires were some of the most tricky parts of this new way of study. Online strategy is a real option, but the success of the process depends on many variables.

**Keywords:** Quality of life. Questionnaire. E-mail.

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# ACCESS TO BREAST CANCER TREATMENT ASSOCIATED WITH MALIGNANT TUMOR CLASSIFICATION AND HISTOPATHOLOGICAL CHARACTERISTICS

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**Objective:** There are differences between patients from the public system and those from Supplementary Health Care seeking treatment for breast cancer. An investigation of the association of the form of access to treatment for invasive breast cancer with the classification of malignant tumors and histopathological characteristics becomes important in view of the scarcity of research in mixed populations such as the Brazilian. **Methods:** This cross-sectional study examined the association of the form of access to treatment for invasive breast cancer with the classification of malignant tumors and histopathological characteristics in 583 patients seen in a cancer center in southeastern Brazil. The Pearson's chi-square test or Fisher's exact test was used for statistical analysis. **Results:** This analysis found an association between the form of access to treatment and morphology, in which invasive ductal carcinoma was more frequent in the public system ( $p=0.024$ ). We found no association with the variables clinical stage ( $p=0.880$ ), pathological stage ( $p=0.585$ ), histological grade ( $p=0.948$ ), nuclear grade ( $p=0.395$ ), estrogen ( $p=0.749$ ), progesterone ( $p=0.943$ ), HER2 ( $p=0.266$ ), Ki-67 ( $p=0.550$ ), and molecular subtype ( $p=0.686$ ). **Conclusion:** In this research, access to treatment showed no association when crossed with clinical and histopathological characteristics of breast cancer.

**Keywords:** Breast Cancer. Tumor biomarkers. Molecular biology.

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# LOCOREGIONAL TREATMENT FOR EARLY-STAGE TRIPLE-NEGATIVE BREAST CANCER: A RECOMMENDATION FROM AN EXPERT PANEL OF THE BRAZILIAN SOCIETY OF MASTOLOGY

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**Objective:** The aim of this study was to evaluate the knowledge and attitudes of the members of the Brazilian Society of Mastology (SBM) about the locoregional treatment of triple-negative breast cancer (TNBC). **Methods:** All 1,400 SBM members were invited to answer a survey of 44 objective questions. An expert meeting was held in December 2021, with the participation of 27 experts and 3 ad hoc consultants. Panelists responded to the survey before and after the meeting (brainstorm). Responses that reached 70% agreement were considered consensual. **Results:** In a patient undergoing conservative surgery after neoadjuvant therapy, with a compromised sentinel lymph node (SLNB), there was a double consensus on the indication of lymphadenectomy (ALND). In patients undergoing upfront surgery, with compromised SLNB, there was a double consensus on the indication of radiotherapy for locoregional control. However, 22% of breast specialists still indicate ALND in patients eligible for the ACOSOG Z0011 study. In women with TNBC who tested negative for pathogenic mutations, 100% of the panelists disagreed with the unrestricted indication of bilateral mastectomy. In women with a positive test, almost 100% of the respondents stated that the possibility of bilateral mastectomy should be considered. The panel reaffirmed the concept of “no ink on tumor” as adequate margins, regardless of initial treatment. **Conclusion:** Consensus among experts was reached on more than 70% of the questions, and agreement between panelists and associates was moderate. In view of the differences observed in some points already consolidated in the literature, it is suggested that the locoregional treatment of TNBC be explored, in an intense and systematic way, in continuing education actions aimed at the mastologist.

**Keywords:** Breast neoplasms. Triple-negative breast neoplasms. Consensus development conferences as topic.

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## SELF-PERCEPTION OF HAPPINESS IN WOMEN WITH BREAST CANCER

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**Objective:** The aim of this study was to establish correlations between well-being and breast cancer (BC)-related aspects.

**Methods:** Women with BC diagnosis (n=42) were interviewed and National Gross Happiness was assessed through an adaptation of the Second Gross National Happiness Survey Questionnaire. Cancer-related data were also assessed, such as staging, anatomopathological results, hormonal status, and surgical modality. **Results:** The mean age during BC diagnosis was 43.8 years. The overall happiness self-perception (HSP) score found was 8.8 out of 10. Unhappy feelings or deprived humor were reported by 61.8% of the interviewed women. Good doctor-patient relationship (DPR) during treatment was reported by 92.3% of the study population, and those who reported it had higher overall HSP scores in comparison with those who reported problems regarding their DPR. Besides, 97.6% of the interviewed women had surgical treatment, and our data showed no significant changes in the overall HSP scores among patients undergoing mastectomy and lumpectomy. **Conclusion:** Women with BC are prone to experience unhappiness and have deprived humor, despite having high overall HSP scores. Besides, in contrast to our original thoughts, the modality of surgical treatment did not have a significant impact on HSP scores.

**Keywords:** Breast cancer. Happiness. Mastectomy. Lumpectomy.



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## BREAST RECONSTRUCTION WITH AND WITHOUT ADJUVANT RADIOTHERAPY: A CRITICAL REVIEW

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**Objective:** Breast cancer is the most common malignancy in women worldwide. After mastectomy, many women wish to reconstruct the affected breast, and immediate breast reconstruction has proven to be oncologically safe in relation to just mastectomy. In addition, indications for post-mastectomy radiotherapy (PMRT) sessions are becoming more frequent, due to their relationship with reduced mortality and locoregional recurrence. For this reason, many women who opted for immediate reconstruction underwent radiotherapy with implants or expanders. This study aims to compare the outcomes of patients with breast cancer undergoing adjuvant radiotherapy after breast reconstruction surgery with an implant or expander with patients who did not need irradiation. **Methods:** A literature review was carried out on the CAPES Journal Portal. **Results:** The studies are unanimous when it comes to the increased risk of complications between the control groups and patients who have undergone PMRT. The reconstructive failure rates are lower, and the aesthetic results are better in surgeries with implants when compared with tissue expanders. Autologous surgeries are apparently safe and should be considered in the context of the PMRT. **Conclusion:** This review did not find sufficient scientific evidence to determine the best technique and the best period for radiotherapy in PMRT indications. It is concluded that the choice of the operative technique and the time of radiotherapy must be at the discretion of the surgeon and the multidisciplinary team of each service, always in a shared decision with the patient.

**Keywords:** Breast cancer. Mammoplasty. Breast implants. Radiotherapy, adjuvant. Autologous. Flaps.

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## PREVALENCE STUDY OF CLINICAL INDICATIONS FOR BREAST MRI

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**Objective:** This is a cross-sectional study of the clinical indications and prevalence of breast magnetic resonance scan.

**Methods:** Data were collected retrospectively from women who had breast MRI performed at the Clínica São Marcelo and who agreed to participate in the study during the period 2020–2021. The data were extracted from the anamneses and respective medical reports of 308 women who had breast MRI scans and analyzed using the SPSS statistical software version 26.0. **Results:** The predominant age group was 40–49 years with a relative frequency of 34.9%, followed by 50–59 years representing 26.7%, women over 60 years with a frequency of 19.9% and 18–39 years with a relative frequency of 18.6%. Regarding clinical indications for breast MRI, breast lump presented 28.2% of indications, breast prosthesis control accounted for 11.7%, family history of cancer 11.7%, breast cancer control 9.4%, post-treatment control 8.4%, screening 6.5%, breast cancer follow-up 5.5%, dense breast 5.5%, family history of cancer and nodule 4.9%, preoperative 3.2%, asymmetry 2.3%, microcalcifications 1.3%, and breast cancer mutation 1.0%. In the Bi-Rads classification, higher percentage for Bi-Rads 2 represented 49.8% and Bi-Rads 3 with a frequency of 27%; Bi-Rads 4 represented 13.4%, Bi-Rads 6 with 5.5%, Bi-Rads 1 with 3.3%, and Bi-Rads 5 represented 1.0% of the classifications of the medical reports. **Conclusion:** This study showed the predominant age group of the women who attended was 40–49 years, and the most prevalent clinical indication for breast MRI was breast lump.

**Keywords:** Prevalence. Breast. MRI. Screening.

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# IMMUNOPHENOTYPING OF BREAST CANCER ASSOCIATED WITH SOCIODEMOGRAPHIC AND LIFESTYLE CHARACTERISTICS

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**Objective:** The immunohistochemical profile of breast cancer is based on the evaluation of estrogen and progesterone receptors, HER2 expression, and cell proliferation index. An investigation of the association of immunophenotyping of invasive breast cancer with sociodemographic characteristics and lifestyle becomes important in view of the scarcity of research in mixed populations such as the Brazilian. **Methods:** This cross-sectional study investigated the association of immunophenotyping of invasive breast cancer with sociodemographic characteristics and lifestyle in 583 patients seen in a cancer center in southeastern Brazil. The Pearson's chi-square test or Fisher's exact test was used for statistical analysis. **Results:** There was a higher frequency of women with the luminal B HER2-negative subtype (33.9%). The analysis of immunophenotyping with sociodemographic characteristics found a higher frequency of women aged 50 years or older in luminal A, 65.5% ( $p \leq 0.040$ ) and medical suspicion of breast cancer at a clinical examination in HER2-positive subtype, 89.7% ( $p = 0.015$ ). In this research, we found no association of immunophenotyping with marital cohabitation ( $p = 0.856$ ), education ( $p = 0.723$ ), ethnicity ( $p = 0.129$ ), access to hospital ( $p = 0.686$ ), tobacco ( $p = 0.099$ ) and alcohol consumption ( $p = 0.270$ ), body mass index ( $p = 0.584$ ), performance of the first mammogram ( $p = 0.477$ ), family cancer history ( $p = 0.254$ ), and parity ( $p = 0.676$ ). **Conclusion:** Younger women had tumors with a worse prognosis when compared to those aged 50 years or older. Ethnicity showed no association, contrary to the wide discussion in the literature about the high frequency of the triple-negative subtype. There was no association with alcohol consumption, a factor recognized in the literature as a risk factor for the development of breast cancer.

**Keywords:** Breast cancer. Lifestyle. Sociodemographic. Characteristics.

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# CLINICAL CHARACTERIZATION OF PATIENTS WITH BREAST CANCER DOING FOLLOW-UP ON A REFERENCE HOSPITAL IN THE WEST OF SANTA CATARINA STATE, BRAZIL

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**Objective:** This study aims to describe the clinical and laboratory parameters of patients with breast cancer doing follow-up in the city of Chapecó, from 2015 to 2020. **Methods:** This is a quantitative, retrospective, documental, and descriptive research, which evaluated the medical charts of 64 female patients diagnosed with breast cancer from 2015 to 2020, doing follow-up in the Hospital Regional do Oeste in the city of Chapecó, Santa Catarina state, Brazil. The data were evaluated through mean ( $\pm$ standard deviation), total frequency, and relative frequency. This research was approved by the Unochapecó's involving human beings' ethics committee under the n. 52495721.8.0000.0116. **Results:** The average age of the analyzed patients was 52.7 years (SD $\pm$ 11.3 years). Regarding the carcinoma subtype, 89.06% of the patients had the ductal subtype and 10.94% had other types of carcinoma (lobular, tubular, mucinous, and papillary). Four variations of molecular subtypes were found: luminal A (n=28), luminal B (n=28), triple-negative (n=5), and HER2-enriched (n=3). Besides that, when evaluating the pathological state, it was noticed that 26.56% had compromised lymph nodes and 9.38% had metastasis. **Conclusion:** Although the scientific literature indicates that the most common molecular subtype is luminal A (about 60% of all breast cancers), in this study it could be verified that there is a similarity in prevalence percentages between the molecular subtypes luminal A and B. The molecular subtype luminal B has the worst prognosis, higher risk of reappearance, and lower survival rate when compared to the luminal A molecular subtype.

**Keywords:** Breast carcinoma. Molecular. Subtypes.

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# ANALYSIS OF WOMEN WITH BREAST CANCER SUBMITTED TO IMMEDIATE OR DELAYED BREAST RECONSTRUCTION

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**Objective:** Breast reconstruction is a right guaranteed by the public health system to patients undergoing mastectomy. However, there are factors that delay the performance of this procedure, mainly in the single health system. This study aims to analyze the characteristics of immediate or delayed reconstructions in women with breast cancer in a referral hospital in the state of Pernambuco (Barao Lucena Hospital). **Methods:** This is an observational, retrospective, analytical research with a descriptive approach of 400 cases of breast reconstruction from 2010 to 2020. Data were collected through a clinical-surgical questionnaire from patients with breast carcinoma who underwent reconstruction mammary, being later analyzed by the SPSS software version 18 with the percentages of the categories evaluated by the chi-square test, considering the level of significance of 5%. The comparison of analyses was significant ( $p < 0.005$ ), demonstrating that the profile described is the most frequent in the group of patients evaluated. CAAE: 42457420.1.0000.5193. **Results:** Most patients were with a mean age between 46 and 59 years (45.3%), mixed race (61.1%), married (79.1%), with schooling up to high school (60.7%), housewives (45%), non-smokers (84.9%), and do not consume alcohol (94.9%). Using the TNM system, 84% of the patients were in the initial stages, underwent immediate reconstruction after mastectomy or sectorectomy (70.3%), and the reconstruction surgeries with regional flaps such as inferior, superior, or mediolateral and implants were performed in 70% of the patients. According to the molecular subtype, luminal A represented 60% of the patients, followed by luminal B with 16%, triple-negative with 15%, and HER2 with 9%. **Conclusion:** The findings support the fact that patients with high educational levels are able to immediately undergo breast reconstruction. We conclude that the number of immediate breast reconstructions in patients with breast cancer has a significant increase.

**Keywords:** Breast cancer treatment. Epidemiology. Mastectomy. Breast cancer. Breast reconstruction.

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# AXILLARY LYMPH NODE CLIP PLACEMENT AND RESECTION AT SURGERY: A SINGLE-CENTER STUDY

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**Objective:** This study aims to identify the characteristics of patients who underwent axillary lymph node clipping (ALC) and determine the detection rate with sentinel node biopsy (SNB). **Methods:** This is a retrospective study with a review of medical records, including patients who were submitted to ALC from 2018 to 2021 and who underwent neoadjuvant chemotherapy (CH) or upfront surgery. In patients with SNB, the clipped node was marked with Technetium-99m before surgery. **Results:** We identified 13 patients who underwent ALC at diagnosis: 8 were submitted to SNB and 5 to axillary dissection without SNB (4 due to poor response to CH, 1 due to lobular histology with upfront surgery). The mean age was 54 years (38% <50 years). The clinical staging was: 12 with cT2cN1 – IIB and 1 with cT3cN2 – IIIA. Concerning tumor characteristics, 12 (92%) patients had ductal histology and 1 lobular; 3 patients had triple-negative disease (23%), 8 patients had luminal disease (61%), and 2 patients had triple-positive disease (15%). In 4 of the 8 patients who underwent SNB, the clip was identified in the image after surgery (2) or in the frozen section (2), and in 4 patients, no information regarding the localization of the clip was obtained in the records regarding the surgery. However, in the follow-up images, the axillary clip was not identified, presuming that it was removed. Considering the patients who did SNB, the detection rate was 50%. **Conclusion:** According to previous studies, ALC at the time of diagnosis is a useful tool to guide targeted axillary dissection, reducing the false-negative rate (FNR) of SNB after CH. It is important that the clip removal check is performed. Our results reflect that this verification is not always performed, which may have reduced identification rates. However, this study encourages further prospective studies to be carried out, with standardization of techniques for clip identification, improving detection rates, and reducing FNR of SNB in these patients.

**Keywords:** sentinel node biopsy

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# EPIDEMIOLOGICAL ANALYSIS OF WOMEN WITH BREAST CANCER SUBMITTED TO BREAST RECONSTRUCTION IN A TERTIARY HOSPITAL IN PERNAMBUCO

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**Objective:** Breast reconstruction is a right assured by the public health system to patients submitted to mastectomy. However, there are factors that delay the performance of this procedure. This study aims to understand the epidemiological profile of women with breast cancer who underwent breast reconstruction in a reference hospital in the state of Pernambuco. **Methods:** This is an observational, retrospective research with an analytical character and descriptive approach. The data were collected through a questionnaire sociodemographic and clinical-surgical history of patients with breast carcinoma and then analyzed by the SPSS software version 18 with the percentages of the categories evaluated by the chi-square test, considering the significance level of 5%. The comparison of analyses was significant ( $p < 0.005$ ), showing that the profile described is the most frequent in the group of patients evaluated. CAAE: 42457420.1.0000.5193. **Results:** A non-probabilistic sample of 400 records was obtained in 10 years at a tertiary hospital in Recife (PE), most of them with a mean age between 46 and 59 years (45.3%), brown (61.1%), married (79.1%), with education until high school (60.7%), household professionals (45%), non-smokers (84.9%), who did not consume alcohol (94.9%), and had immediate reconstruction after mastectomy (70.3%). **Conclusion:** The findings support that patients with high educational levels are likely to undergo immediate breast reconstruction, pointing out that the socioeconomic level significantly influences the rates of breast reconstruction after mastectomy.

**Keywords:** Breast cancer treatment. Epidemiology. Mastectomy. Breast cancer. Breast reconstruction.

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## DELETERIOUS VARIANTS IN RAD51C GENE AND BREAST CANCER – REPORT OF THREE PATIENTS WITH TRIPLE-NEGATIVE BREAST CANCER

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RAD51C is a gene associated with hereditary predisposition to ovarian cancer, and its association with hereditary breast cancer was controversial for a while. Current evidence demonstrates that RAD51C deleterious variants increase the risk of estrogen receptor-negative breast cancer. This study presents three unrelated patients with triple-negative breast tumors with heterozygous deleterious RAD51C variants. The first patient was diagnosed with post-menopausal breast cancer at 55 years of age and treated with conservative surgery and adjuvant chemotherapy. Her sister had breast cancer at 49 years of age. Multigene panel showed a heterozygous pathogenic variant in RAD51C:c.93del; p.(Phe32Serfs\*8). The second patient was diagnosed at 48 years of age and treated with neoadjuvant chemotherapy, followed by a conservative surgery with lymph node dissection and radiotherapy. Her sister had triple-negative breast cancer at 64 years of age; her maternal cousin had breast cancer at 58 years of age. Multigene panel disclosed a heterozygous pathogenic variant in RAD51C:c.404G>A; p.(Cys135Tyr). The third patient, detected with the same mutation, was diagnosed with triple-negative breast cancer at 39 years of age and treated with neoadjuvant chemotherapy, bilateral mastectomy, and adjuvant radiotherapy. Her paternal aunt had ovarian cancer, her paternal grandfather had prostate cancer, and her sister had breast cancer at 40 years of age. Genetic counseling was provided for all patients, along with the recommendation of risk-reducing salpingo-oophorectomy, due to ovarian cancer risk. This study adds evidence for the inclusion of the RAD51C gene in multigene panels as a relevant gene to be screened in patients with triple-negative breast cancer.

\*\*All three patients signed an informed consent.

**Keywords:** Triple-negative breast cancer. Hereditary cancer predisposition.



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## ULTRASOUND-GUIDED VACUUM-ASSISTED RESECTION: REPORT OF A CASE SERIES

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**Objective:** This study aims to report a series of cases of lesions that were probably benign (ACR<sup>®</sup> BI-RADS 3) and with a low degree of suspicion (ACR<sup>®</sup> BI-RADS 4A) submitted to vacuum-assisted resection for diagnostic and therapeutic purposes. **Methods:** From August 2020 to January 2022, 16 patients underwent ultrasound-guided 10-gauge vacuum-assisted needle resection under local anesthesia. The biopsy needle was positioned according to the echographic view of the lesion, in order to obtain the fragments by suction. After the procedure, a titanium clip was positioned demarcating the site. **Results:** We performed 16 vacuum-assisted resections in lesions whose largest diameter varied between 0.4 and 2.5 cm (median=1.4 cm and standard deviation (SD)=0.66). We obtained samples whose measurements of the set of fragments varied between 2.2 and 3.6 cm (median=3.0 cm and SD=0.37). Of the 16 cases, 15 histologies were benign, predominating fibroadenomas and having 2 complex sclerosing lesions. Only 1 ductal carcinoma *in situ*. We had 1 case of hematoma with clinical repercussions and 1 case of increased bleeding at the skin incision site, both managed conservatively with good evolution. **Conclusion:** In our case series, vacuum-assisted resection allowed the investigation and, in most cases, the necessary therapy for the management of BI-RADS 3 and BI-RADS 4A lesions when the histology was benign and provided sufficient diagnostic data for the conduction of the case of carcinoma *in situ*, in which the conservative surgery performed maintained the same histological diagnosis. Vacuum-assisted resection can, in selected cases, replace a diagnostic and/or therapeutic surgical procedure, reducing morbidity and costs in the investigation and treatment of breast lesions, with minimal complications.

**Keywords:** Ultrasound.

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# NEUROENDOCRINE CARCINOMA OF THE BREAST AND ILEUM IN A PATIENT WITH BRCA2 PATHOGENIC VARIANT – ONCOLOGIC AND GENETIC CONSIDERATIONS DERIVED FROM A CASE REPORT

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**Background:** Neuroendocrine neoplasms (NENs) are a heterogeneous group of neoplasms. Most frequently, they occur in the digestive system, and breast neuroendocrine tumors constitute less than 1% of all of them. Germline mutations can increase the risk of developing tumors and predispose to hereditary cancer syndromes. Some NENs are well-established components of common hereditary syndromes. Recently, whole genomic sequencing revealed that 17% of apparently sporadic pancreatic NENs carried germline mutations, including DNA repair genes, such as BRCA2. It is well known that this gene plays a role in hereditary breast cancer, but variations in these genes were not described in patients with breast/ileum neuroendocrine tumors. We present a patient with a neuroendocrine tumor and a germline pathogenic variant in BRCA2. **Case report:** A 44-year-old female patient presented with a palpable lesion at the right breast, with 1.1×1.4 cm, and a biopsy confirmed an invasive ductal carcinoma, grade 2. Immunohistochemistry revealed a neuroendocrine breast carcinoma (ER10% PR5%, HER2 negative, Ki-67=8%). The regular staging examinations did not show any abnormalities, but a 68Ga PET/CT demonstrated an ileum wall thickening with a marked expression of somatostatin receptors compatible with primary disease, with mesenteric lymph nodes and hepatic lesions suggestive of metastasis, in addition to the right breast lesion that could be either a secondary implant or a primary synchronous tumor. A detailed family history did not reveal any important cancer cases in the family except for the father and a paternal uncle, both with prostate cancer at 72 and 85 years old, respectively. Germline genetic analysis confirmed the presence of a heterozygous pathogenic variant in BRCA2 (c.2167delA;p.Ser723Alafs\*7). The patient is currently being treated with octreotide LAR with good tolerance and stable disease. **Final comments:** This case shows the importance of molecular germline investigation in patients with NENs. This patient adds knowledge to the association of the BRCA2 gene and neuroendocrine tumors.

**Keywords:** Breast cancer. BRCA2.

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# MALE BREAST CANCER ASSOCIATED WITH A LARGE DELETION IN BLM GENE – REPORT OF A CASE

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Malignant breast neoplasm in men is rare, corresponding to less than 1% of all breast neoplasms, and 100 times less frequent than in women. It is molecularly different from female breast cancer, and germline pathogenic mutations in genes aside from BRCA1 and BRCA2 have been recently associated with an increased risk of male breast cancer. Here, we report an elderly male, 71 years old, with a malignant neoplasm in the left breast, with positive hormone receptors, HER2-negative, and Ki-67 of 25%. A modified radical mastectomy was performed, and the surgical specimen showed a micropapillary invasive mammary carcinoma, 1.9 cm, 2 of 11 lymph nodes positive, pT1cpN1acM0. He was treated with adjuvant chemotherapy and radiotherapy, followed by endocrine therapy. His mother had breast cancer at 50 years, and his smoking father died of lung cancer. During his treatment, a multigene panel was done and a heterozygous likely pathogenic large deletion involving exons 20–22 of the BLM gene was found, associated with a variant of unknown significance in the same gene; c.3427G>A; p.(Glu1143Lys). All his three daughters harbor the same mutation. The risk of breast cancer in association with a heterozygous pathogenic variant in the BLM gene is still controversial because of its ability to cause tumors when not associated with polymorphisms in other homologous recombination genes, which poses a challenge for genetic counseling, surveillance, and management. This report aims to add data and clinical evidence to the attempts to elucidate the role of BLM germline variants in breast cancer predisposition.

\*Patient signed an informed consent.

**Keywords:** Male breast cancer. Cancer predisposition.

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# BREAST PLASMACYTOMA: A CASE TREATED WITH IRRADIATION THAT EVOLVED TO FURTHER BILATERAL BREAST INVOLVEMENT AND SYSTEMIC DISEASE REFRACTORY TO CHEMOTHERAPY

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**Introduction:** Plasmacytomas are uncommon malignant lesions in the breast. Further knowledge is needed about the presentation, diagnosis, and therapy of this disease. **Case report:** A 78-year-old woman had a previous diagnosis of sacral bone plasmacytoma in March 2005 that was treated with radiotherapy. A new lesion involved in the cervical spine in 2008 was also irradiated. A mammogram and ultrasound found two well-defined nodules in January 2012 in the upper outer quadrant of the right breast, with a total diameter of 38 mm. Biopsy showed a proliferation of cells with Ki-67 staining in more than 90% and positivity for CD38, CD138, CD45, and CD79A, an exclusive expression of lambda light chains. The pathological diagnosis was anaplastic plasmacytoma. She received radiotherapy with remission of the breast lesions. After further appearance of bone lesions, she started chemotherapy with bortezomib, melphalan, and prednisone in January 2016. A PET study in July 2016 showed, among other findings, the presence of a 4-cm lesion in the upper-outer quadrant of the left breast (SUVmax: 3.9). Biopsy gave a diagnosis of plasmacytoma, with cells staining strongly positive for CD138, MUN1, and CD38, with the expression of lambda light chain. Chemotherapy was changed to lenalidomide plus dexamethasone. A further PET in January 2017 displayed, among other findings, the persistence of the lesion in the left breast (SUVmax: 5.4) with two new lesions in the right breast (SUVmax: 5.3 and 13). There was also a sacral progression, and chemotherapy was changed to pomalidomide, dexamethasone plus cyclophosphamide. The evolution of the patient was unfavorable, and she died in June 2017. Criteria for multiple myeloma were not present along the course of the disease. **Conclusion:** Evolution to bilateral involvement, relapse in the same breast, and refractoriness to chemotherapy are remarkable aspects of this case report and give further information about this presentation of the disease.

**Keywords:** Plasmocytoma. Breast cancer. Radiotherapy.

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# PREPECTORAL BREAST RECONSTRUCTION: A PRELIMINARY REPORT OF A CHILEAN EXPERIENCE IN 46 PATIENTS

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Prepectoral total breast reconstruction (PPTBR) has become a popular technique due to the many benefits observed in properly selected patients. Compared with the retropectoral implant position, PPTBR has the advantage of maintaining the pectoral major muscle in its anatomic original position, avoiding acute and chronic pain, maintaining better extremity strength and motion, and avoiding animation deformity and post-radiotherapy pectoral fibrosis. The basic principles of the technique can be used with a tissue expander or permanent implants. We present the preliminary report of 46 patients (51 breasts). In all, 20 out of the 46 patients had an association with radiotherapy; 18 of them received post-mastectomy radiotherapy and 2 received total breast irradiation on previous conservative treatment. The period of follow-up was 2–32 months, beginning in July 2019. The main surgical approach was using a lateral aspect of the inframammary fold incision. Depending on the new subdermal implant pocket width, in 20 patients, a synthetic mesh was placed. We only had two major complications: one who required reintervention due to radionecrosis and conversion to a dorsal flap plus a permanent implant, and the other who required a change into a retropectoral plane reconstruction due to wound dehiscence. No implant infection of grade 3–4 capsular contraction has been reported so far. The aesthetic result was excellent for most patients and the surgeon's opinion, according to the Harris scale.

**Keywords:** Prepectoral breast reconstruction. Breast cancer.

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# CASE REPORT: PHYSIOTHERAPY TELESERVICE IN THE IMMEDIATE POSTOPERATIVE BREAST CANCER SURGERY

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**Introduction:** Breast cancer is one of the most incidents and most common among women; surgical intervention is the main treatment, and physiotherapy plays an important role in the postoperative period, especially in the maintenance of range of motion and prevention/control of lymphedema. In the face of the contemporary scenario in which social isolation has been maintained due to the COVID-19 pandemic, the Federal Council of Physiotherapy and Occupational Therapy in Brazil released forms of remote care for patients who need clinical intervention. **Objective:** This study aims to report the experience of telecare in physiotherapy in the postoperative period of breast cancer surgery, focusing on aspects, pain, fatigue, mobility of the upper limb, and development of lymphedema. **Case report:** This is an experience report based on the telecare of a 61-year-old mastectomized patient, with 9 consultations, 8 in the remote format. The participant was evaluated regarding health habits, edema, sensation of pain, and tiredness using the Visual Scale of Pain (VAS), the Borg Rating of Perceived Exertion Scale, and a self-authored mastology questionnaire. In the initial evaluation, we found movement limitation (flexion-90°, extension-30°, and abduction-90°), the sensation of tightness in the scar, the sensation of a heavy limb, and dryness on the side of the surgery. In the final evaluation, we observed improvements when compared to the member opposed to surgery, in the gain of range of motion (flexion-180°, extension-45°, and abduction-180°), reduction of pain (VAS) and fatigue (BORG), and improvements in activities of daily living. **Conclusion:** The service in physical therapy was effective and obtained results similar to those expected in conventional face-to-face physical therapy treatments.

**Keywords:** Breast cancer. Physical therapy modalities. Telemonitoring.

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# SENTINEL NODE BIOPSY WITH MAGTRACE® IN A HER2-POSITIVE PATIENT DIAGNOSED DURING PREGNANCY WITH COMPLETE CLINICAL RESPONSE TO NEOADJUVANT TREATMENT

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During the past decades, there has been significant progress in breast cancer diagnosis and treatment, which has led to improvement in overall and breast cancer-specific survival. It has also enabled the possibility of de-escalating the extent of surgeries. There is growing evidence that supports sentinel lymph node biopsy (SLNB) after neoadjuvant treatment, even in cases with positive lymph nodes at diagnosis. One of the key goals is the achievement of low false-negative rates for SLNB detection. Technetium-99 (Tc99) is considered the gold standard tracer worldwide. Nonetheless, access to a nuclear medicine department, the timing of Tc99 injection, operating room schedules, and administrative limitations can cause increased overall costs of care and patient discomfort. There is compelling evidence that supports the use of new tracers; one of these is the superparamagnetic iron oxide (SPIO, Magtrace®). The SPIO allows the detection of the sentinel node marking hot spots and has the advantage of dyeing the nodes with a brownish color. We present a novel experience with this tracer in a Chilean public hospital. A 33-year-old patient was diagnosed with right breast cancer during pregnancy (21 weeks). The core biopsy revealed an invasive ductal carcinoma HER2-positive, cT2N0M0 (25 mm). The patient completed neoadjuvant chemotherapy, and pregnancy interruption was scheduled at 37 weeks by cesarean section. Trastuzumab (TTZ) was initiated right after delivery and breast conservation surgery with SLNB using SPIO, and blue dye was performed thereafter. Intraoperative biopsy revealed three negative nodes, concordant with the hot spots and dyeing seen in surgery. This case shows the efficacy of neoadjuvant treatment and TTZ in HER2-positive patients with a high rate of complete clinical response. In our opinion, this new tracer is an excellent and affordable alternative to Tc99 and could avoid the use of blue dye.

**Keywords:** Breast cancer. Neoadjuvant treatment. Sentinel node. Pregnancy.

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# IRON OVERLOAD IN A BREAST CANCER PATIENT WITH A HOMOZYGOUS MUTATION IN THE HFE HEMOSTATIC IRON REGULATOR GENE: CONSIDERATIONS REGARDING THE USE OF ADJUVANT HORMONE THERAPY

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**Introduction:** Homozygous mutations in the HFE gene are among the causes of iron overload worldwide. Several reports suggest an increased risk of breast cancer (BC) in these patients, although there are controversial evidences on this subject. There is some discussion on the tolerance to some BC adjuvant therapies in these patients regarding aspects like the potential cardiotoxicities. Information on adjuvant hormone therapy in this setting is very limited. **Case report:** A 65-year-old woman was treated with segmental resection in the left breast and selective biopsy of the sentinel node in April 2019. Pathology showed an infiltrating ductal carcinoma of 1.2 cm, grade 1, with two negative sentinel nodes. Estrogen receptor was 100%, progesterone receptor was 20%, Her2/neu was 1+, and Ki-67 was 15%. A previous diagnosis of hemochromatosis was done in October 2018 with a high transferrin saturation and a genetic analysis disclosing a homozygous C282Y mutation in the HFE gene. Regular phlebotomies every 3 months were scheduled for the treatment of the iron overload. Several points were considered for the selection of the adjuvant hormone therapy. Articular damage is a common complication of hemochromatosis. In fact, a hip prosthesis was implanted in 2018 for our patient with severe coxarthrosis. There was some risk of further articular impairment with aromatase inhibitors (AI). Furthermore, AI may have an androgenic effect, with some effect on the red cell mass. On the contrary, tamoxifen may increase the risk of porphyria crises in patients with hemochromatosis. We selected letrozole as adjuvant therapy, with good articular tolerance and fair hematological control after nearly 3 years of follow-up. **Conclusion:** Although homozygous HFE mutations may increase the risk of some adverse events related to BC adjuvant hormone therapy, the tolerance to letrozole in our patients has been very good, without raising further concerns.

**Keywords:** Breast cancer. Iron overload. Hormone therapy. HFE.



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# LOCALLY ADVANCED SYNCHRONOUS BILATERAL BREAST CANCER: A RARE CASE REPORT

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**Introduction:** Synchronous bilateral breast cancer (SBBC) consists of the simultaneous presence of two primary tumors at diagnosis. There is no consensus on its origin, and it may be a metastasis of a primary lesion or a second independent tumor. The incidence of SBBC has been reported to be approximately 3%. The prognosis of SBBC was considered to be reserved, which is why bilateral mastectomy is the preferred approach. **Case report:** A 44-year-old patient with no family record of gynecological neoplasm sought care reporting bilateral breast pain and palpable nodular lesions on the breasts. On examination, a hard nodule measuring 10×12 cm was palpated on the left breast (LB) associated with ulcerated areas in the superior lateral quadrant. On the right breast (RB), a mobile nodule was palpable, measuring 8×8 cm with chocolate-colored nipple discharge. Clinically positive axillary lymph nodes are bilateral. She had a mammogram, which showed a nodule with spiculated contours, measuring 2.5 cm in the SLQ of the LB, with apparent associated dermal retraction and multiple, grouped microcalcifications on RB-BIRADS 5. She underwent core biopsy, which resulted in invasive lobular carcinoma and dermal infiltration, with immunohistochemistry (IHC): positive PR and ER, positive HER2, Ki-67 positive in 40% on LB, and carcinoma invasive ductal, non-special type, with IHC: negative RP and RE, HER2 score 3+, and Ki-67 positive in 60% on RB. She underwent neoadjuvant chemotherapy, followed by bilateral mastectomy with sentinel lymph node biopsy. The anatomopathological (AP) study of the LB surgical specimens revealed residual ductal carcinoma *in situ*, free margins, and neoplasm-free lymph nodes. The RB's AP revealed high-grade (comedocarcinoma), intermediate-grade residual intraductal carcinoma, alongside an extensive fibro hyalinized area of the stroma, foci of lobular cancerization, absence of residual invasive component, free margins, and absence of lymph node metastasis. The patient underwent adjuvant radiotherapy and hormone therapy with tamoxifen.

**Keywords:** Breast neoplasms Mastectomy.

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## METASTATIC BREAST CANCER TO THE UTERINE CERVIX: A CASE REPORT

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A 49-year-old woman was diagnosed with invasive ductal carcinoma in the left breast with positive estrogen and progesterone receptors (ER, PR) and negative HER2, and Ki-67 10%. Computed tomography of the abdomen, chest, and bone scintigraphy did not show metastasis. Treatment was established with neoadjuvant chemotherapy, followed by sectorectomy, sentinel lymph node biopsy, and oncoplasty. Freezing was negative, but in the anatomopathological result, metastasis in the axillary lymph node was observed. Then, axillary lymphadenectomy was performed, and she underwent radiotherapy and hormone therapy. Around 6 months later, she remained asymptomatic and underwent oncotic colposcopy. It detected atypical squamous cells but was not able to rule out intraepithelial lesions (ASCH). The investigation was continued by means of colposcopy and conization that showed poorly differentiated carcinoma and alterations suggestive of metastatic mammary carcinoma to the uterine cervix. This diagnosis was confirmed with immunohistochemistry: HER2 negative, ER and PR 95%, and Ki 67 30%. Magnetic resonance imaging of the chest, pelvis, and abdomen, and transvaginal ultrasound showed no suspicious lesions. She is currently being diagnosed with breast nodule ultrasound with a Bi-RADS 4 and is still under anatomopathological investigation. **Discussion:** Metastasis to the female genital organ originating from a primary extragenital tumor is uncommon. The most common sites of invasive breast metastasis are the lung, liver, bone, and brain. Its occurrence in the uterine cervix is rare, probably due to a small blood supply and an afferent lymphatic system. Its prevalence is uncertain in the literature. Only strict gynecological surveillance of these asymptomatic women permits early detection of these secondary lesions. This case report shows the importance of considering rare sites of metastasis on follow-up given the different treatment protocols related to primary cancer and the clinical impact on prognosis. Besides, it is pertinent to know the exact nature of cervical cancer, mainly in women with a personal history of breast cancer.

**Keywords:** Breast cancer. Metastasis. Uterine cervix.

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# SPOROTRICHOSIS IN AXILLARY LYMPHADENOPATHY SIMULATING RECURRENCE OF BREAST NEOPLASM: A CASE REPORT

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**Introduction:** Sporotrichosis is a mycosis caused by dimorphic fungi of the *Sporothrix* complex. It is an anthroponotic disease that can be transmitted to humans by contact with plants or animals, especially infected cats. Clinical presentation may vary depending on the host's immunological condition. The diagnosis of sporotrichosis requires material obtained from lesion biopsies, which can be submitted for culture and microscopy. **Case report:** A 57-year-old female patient, being followed up for carcinoma *in situ* of the left breast, presented with ipsilateral axillary lymphadenopathy on routine examinations. She underwent ultrasound-guided core-needle biopsy of a suspicious lymph node in the left axilla, with a diagnosis of chronic granulomatous lymphadenitis containing fungal yeasts, suggestive of sporotrichosis. Treatment with systemic antifungal itraconazole was started with a good response. **Discussion:** Sporotrichosis is an important differential diagnosis for lymphadenopathy, associated or not with neoplasms being treated in our country. In the presented case, the patient had an oligosymptomatic presentation of sporotrichosis, probably a subacute form of the cutaneous-lymphatic presentation, initially evidenced only on evaluation with imaging methods, with a good response to systemic antifungal therapy with itraconazole, also remaining without signs of recurrence of breast cancer. **Conclusion:** Considering Brazil as an endemic area for sporotrichosis, the description of cases such as this one allows us to discuss and remember this differential diagnosis in clinical situations and/or in imaging examinations, even in patients undergoing follow-up for malignant neoplasms.

**Keywords:** Sporotrichosis. Breast cancer.

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# PRIMARY BREAST TUBERCULOSIS MASTITIS MANIFESTED AS NON-HEALING ABSCESS

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Primary breast tuberculosis is a rare extrapulmonary tuberculosis mainly affecting young women of childbearing age in endemic countries. Its incidence is increasing in immunocompromized and HIV-infected people and with the emergence of drug-resistant strains of *Mycobacterium tuberculosis*. There are no specific clinical signs suggestive of this disease, and it often presents as a hard mass or breast abscess. There is an overlap of features with other inflammatory, infectious, benign lesions, fat necrosis, and malignant neoplasms of the breast. The detection of *Mycobacterium tuberculosis* remains the gold standard for diagnosis. Several diagnostic modalities are used, with varying degrees of lack of sensitivity and specificity, and with a range of false negatives. A quarter of cases were treated solely on the basis of clinical, imaging, or histological suspicion, without confirmation of the diagnosis. Therefore, we report the case of a young Vietnamese woman who presented with a non-healing breast abscess and was diagnosed with breast tuberculosis based on the patient's ethnicity, histological findings, lack of clinical response to conventional antibiotic therapy, and a good clinical response to antituberculosis treatment.

**Keywords:** Abscess. *Mycobacterium tuberculosis*. Case reports.

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# INCIDENTAL FINDING OF SOLITARY FIBROUS TUMOR OF MALE BREAST

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Myofibroblastoma (MFB), also known as a solitary fibrous tumor of the breast, is a rare sporadic benign tumor composed of spindle-shaped tumor cells with myoblast differentiation. The most typical presentation is a painless unilateral mass that is not connected to any surrounding structure and seldom surpasses 3 cm in size and should be evaluated by using the triple-assessment approach. They have several subtypes, and a definite diagnosis can only be confirmed safely after surgery using immunohistochemistry. Surgical excision serves an essential diagnostic and therapeutic purpose; MFB has a favorable prognosis even when excision margins are positive, and local recurrence is extremely rare. The following is the case of a 73-year-old man who presented with a dry cough. An MFB was discovered by chance during the investigative workup and referred to our department. The patient's presentation, imaging, and histological samples all supported the diagnosis, and he had surgical resection without incident. We present the second case of an incidental finding of breast MFB and urge clinicians to consider this differential diagnosis.

**Keywords:** Solitary fibrous tumor. Myofibroblastoma. Breast. Male. Mastectomy. Case reports.

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## EXTREME ONCOPLASTIC SURGERY IN A PATIENT WITH BREAST CANCER AND MACROMASTIA

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Until the 1970s–1980s, the only treatment recommended for breast cancer was mastectomy. During those years, prospective randomized trials confirmed the survival equivalency for breast conservation (when compared to patients with tumors 5 cm or smaller). During the past decades, there has been significant progress in breast cancer diagnosis and treatment. This progress has led to improved overall and breast cancer-specific survival. Extreme oncoplasty is a breast-conserving surgery that uses oncoplastic techniques in a patient who, in most cases, would require a mastectomy. This is particularly useful in patients with breast cancer and macromastia, with an oncoplastic reduction approach in the affected breast and reduction mammoplasty in the contralateral breast. We present the case of a 32-year-old woman with a multifocal tumor located in the inner lower quadrant of the right breast. The core biopsy revealed an invasive ductal carcinoma of 2.5 cm (cT2 N1 HER2+). After neoadjuvant chemotherapy with trastuzumab, there was a complete clinical response. The surgical treatment was an extreme oncoplastic surgery in the affected breast with a reduction mammoplasty to the left breast. The surgical biopsy revealed a complete pathological response both in the breast and the axilla. After a 7-month follow-up, there is no locoregional recurrence and the aesthetic result is excellent for both the patient and the surgical team. We selected this case to prove that despite the COVID-19 pandemic, it is possible to offer the best surgical treatment according to each patient, giving the option of personalized medicine.

**Keywords:** Extreme oncoplasty. Breast reduction. Reduction mammoplasty.

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# HYPERCALCEMIA IN NEWBORN SECONDARY TO MALIGNANT HYPERCALCEMIA IN PREGNANT WOMAN WITH METASTATIC BREAST CANCER: A CASE REPORT

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A multipara pregnant woman, 38 years old, presented with an initial suspicion of antibiotic-refractory mastitis. A breast biopsy revealed luminal type B invasive carcinoma and the image showed bone and liver metastases. She developed oligosymptomatic hypercalcemia requiring hydration and underwent cesarean at 35 weeks and 6 days; 2 days later, she received an osteolysis inhibitor, and a week later started chemotherapy. A baby boy was born with Apgar 9/10; hypercalcemia was observed after 12 h; then, he developed lethargy, hypotonia, and bradypnea after 21 h, requiring continuous positive airway pressure and monitoring. He received volume expansion with an improvement in his condition. Signs of breast cancer are confused with physiological breast changes in pregnancy such as engorgement, hypertrophy, and nipple discharge, implying a delay in diagnosis. Hypercalcemia during pregnancy occurs in about 0.03% of women; maternal complications include acute kidney injury, severe hypertension, and pre-eclampsia. Fetal adverse outcomes include intrauterine growth restriction, fetal demise in utero, neonatal hypocalcemia, tetany, and permanent hypoparathyroidism. Primary hyperparathyroidism is the main cause; hypercalcemia from metastatic breast cancer can be due to osteolytic metastases and humoral hypercalcemia of malignancy caused by peptide release related to parathyroid hormone, which promotes bone resorption and renal calcium reabsorption. In cases of malignant hypercalcemia, pamidronate is effective in inhibiting osteolysis, but it reduces uterine contractions and presents a teratogenic risk. Calcitonin is well tolerated during pregnancy but has a limited effect; the use of glucocorticoids can also be considered. In case of maternal hypercalcemia, the newborn's calcium levels must be monitored. Hypercalcemia in pregnancy is a rare condition when cancer-related hypercalcemia may cause great maternal morbidity and fetal and neonatal morbidity and mortality. The manifestations presented by the neonate were compatible with the suspicion of neonatal hypercalcemia. Diagnostic confirmation was made based on the metabolic condition; the basis of emergency treatment is intravenous hydration.

**Keywords:** Breast cancer. Hypercalcemia. Pregnancy.

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## CONSERVATIVE SURGERY IN ADENOID CYSTIC CARCINOMA: A CASE REPORT

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**Objectives:** Adenoid cystic carcinoma of the breast (CACM) is uncommon, comprising less than 0.1% of breast carcinomas. In the literature, many authors argue that local control is achieved through mastectomy, especially in high-grade histological tumors. We report a case of CACM treated with conservative surgery at the Mastology Service of Hospital das Clínicas da UFMG. **Methods:** ASG, a 62-year-old, female patient presented with a 2-cm palpable nodule on the left breast, with the following mammographic representation: isodense nodule in the upper lateral quadrant, obscured contours, measuring 20 mm. She underwent a diagnostic sectorectomy and was diagnosed with basaloid solid-type CACM, grade 3, triple-negative phenotype, measuring 1.5 cm, with compromised lateral and anterior margins. She underwent a new sectorectomy and sentinel lymph node biopsy, with no invasive neoplasm in the sample and four sentinel lymph nodes, all free of metastasis. Subsequently, she underwent radiotherapy. On biopsy, CACM, grade 2, triple-negative phenotype was diagnosed. She was treated with conservative surgery and radiotherapy. **Results:** Follow-up with no signs of local recurrence or distant metastasis at one-year follow-up. **Conclusion:** Although most adenoid cystic carcinomas present with the basal-like, triple-negative phenotype, these tumors are generally of low histological grade and present an indolent biological behavior. Based on these clinical characteristics, the most recent studies have demonstrated the effectiveness of treatment with a complete excision of the tumor with wide margins and the addition of radiotherapy.

**Keywords:** Breast neoplasms. Adenoid cystic carcinoma.



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# THORACIC RECONSTRUCTION: THE IMPORTANCE OF PLASTIC SURGERY IN ONCOLOGY TREATMENTS

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**Introduction:** Breast cancer is the most common neoplasm in women, excluding non-melanoma skin neoplasm, and it represents 22% of new cases each year. Due to treatment breakthroughs, patient survival has increased, which indicates that social and functional rehabilitation through chest wall reconstruction is its paramount component. **Objective:** This study aims to report a case of a patient with recurrent breast cancer and the need for chest wall reconstruction. **Case report:** LLVA 47 years old, with cancer on her right breast treated with partial mastectomy, radiotherapy, and chemotherapy, which evolved into a chest wall undifferentiated pleomorphic sarcoma. A complex thoracotomy was performed in oncology with tumor resection on the right chest wall and resection of the 3rd, 4th, 5th, and 6th costal arches, followed by a reconstruction, accomplished with 2 acetabular plates and a 42-cm polypropylene mesh. Afterward, a rotation of myocutaneous flaps with latissimus dorsi and transversus rectus abdominis (TRAM) with a contralateral pedicle was performed. The patient evolved with fair flap perfusion. **Discussion:** Plastic surgeons' participation in oncological treatments has shown increasing importance, allowing the performance of large resections that could be considered unresectable without their repair. Thus, reconstruction is essential to increase quality of life and to provide local conditions for accessorial treatment. During chest wall reconstruction, the technical difficulty lies in the extent of resections, requiring reconstruction of the costal bone framework when there is resection of four or more ribs or when there is a lateral defect greater than 5 cm. The most commonly used flaps are the latissimus dorsi myocutaneous and the TRAM flap. **Conclusion:** Plastic surgeon is a fundamental character of a multidisciplinary team in the treatment of breast cancer, especially in large resection situations.

**Keywords:** Breast neoplasms. Myocutaneous flap. Surgery, reconstructive. Surgery, plastic.

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# PHOTOBIMODULATION AND MANUAL LYMPH DRAINAGE FOR THE TREATMENT OF NIPPLE NECROSIS IN BREAST CANCER PATIENT: TWO CASE REPORTS

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**Introduction:** Breast cancer is the most common malignant neoplasm among women in the world and in Brazil, accounting for approximately 28% new cases each year. Recently, breast reconstruction after mastectomy with preservation of the nipple has been an alternative breast cancer treatment. However, despite its efficacy and esthetic superiority, the preservation of the nipple has been associated with several complications in the postoperative period. The therapy of photobiomodulation, formerly known as low-level laser therapy, has been demonstrated to promote repair of tissues by cellular repair biostimulation, angiogenesis, and anti-inflammatory effects. These characteristics suggest a potential role for the repair of chronic wounds and may be applicable in the treatment of necrosis. **Objective:** This study aimed to observe the effects of physiotherapeutic intervention through photobiomodulation therapy in two patients with nipple necrosis after mastectomy. **Methods:** Two Brazilian females with necrosis of more than 40% of the nipple on the right breast after breast mastectomy and reconstruction were referred to physical therapy (PT). PT sessions were composed of manual lymph drainage, manual therapy, and exercises of strength and flexibility, followed by photobiomodulation. Patient 1 received laser therapy with a laser at 660 nm, 3 joules per point every 1 cm. The device used was the Laser Therapy DMC, with a power output of 100 mw. The therapy was implemented 12 times in total, and a reevaluation was performed monthly until 12 months of follow-up. Patient 2 received led therapy at 660 and 850 nm, 3 joules per point every 2 cm. The device used was the Ledtherapy Cosmedical, with a power output of 5 mW, for a total of 24 treatments, and follow-up was performed until 6 months post-therapy. **Conclusion:** Photobiomodulation was helpful for wound healing. Confirmation of the sustained effects of photobiomodulation was shown in a 6-month follow-up.

**Keywords:** Breast cancer. Low-level laser therapy. Photobiomodulation.

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## THE IMPORTANCE OF MANAGING B3 LESIONS: A CASE REPORT

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The lesions of uncertain malignant potential of the breast, classified as B3, besides increasing the relative risk for breast cancer, have very heterogeneous abnormalities and raise a big question when defining conduct. A good multidisciplinary evaluation is necessary, comparing biopsy and imaging test results. This study reports the case of a 54-year-old patient, without other risk factors for breast cancer, who was referred to MAMARJ, a mastology clinic, from a gynecology service, in November 2019 for evaluation of category 4 mammography, due to alterations in the right breast: linear and heterogeneous calcifications in the upper outer quadrant (UOQ) and punctiform and grouped calcifications in the lower inner quadrant (LIQ). Mammotomies were indicated, and histopathological reports were compatible with columnar cell hyperplasia with a focus on planar atypia — in the UOQ — and adenomyoepithelioma and columnar cell hyperplasia without atypia in the LIQ. She was taken to surgery to remove the lesion from the UOQ (histopathology without malignancy). In July 2020, she underwent mammography with a category 2 (BIRADS) report due to parenchymal distortion from previous surgery, and ultrasonography with sparse cysts and bilateral ductal ectasia (category 3). One year later, in July 2021, she presented mammography — amorphous calcifications in the upper quadrants and punctate calcifications in the LIQ, near the clip from the previous mammotomy. Mammotomy of the calcifications in the upper quadrants was performed. The diagnosis of the vacuum-guided biopsy was columnar cell changes with minimal architectural atypia in the upper quadrants. Removal of the lesion from the upper quadrants and the LIQ (target of the previous mammotomy) was indicated. The histopathological diagnosis was ductal carcinoma *in situ* (LIQ), associated with atypical ductal hyperplasia, microcalcifications, and flat epithelial atypia. Immunohistochemical panels include estrogen receptor positive, progesterone receptor positive, and human epidermal growth factor receptor-type 2 negative. The upper quadrant lesion was compatible with a focus of intraductal proliferation with discrete atypia. A simple mastectomy was performed with immediate reconstruction of the right breast. Mastectomy was indicated mainly because it was the patient's choice. As suggested, since the first diagnosis of B3 lesion and after that of ductal carcinoma *in situ*, the patient did not accept chemoprevention. It should be noted that risk-reducing mastectomy is cited only rarely for prevention in cases of recurrent and multicentric premalignant lesions, as in this case.

**Keywords:** Breast cancer. Breast carcinoma. Ductal atypical hyperplasia.

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# PRIMARY INVASIVE DUCTAL CARCINOMA OF AXILLARY ACCESSORY BREAST

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Primary accessory breast cancer is an extremely rare pathology, representing less than 1% of all breast cancers, and it is found in more than 90% of cases in the axilla. The diagnosis of accessory axillary breast cancer (AABC) is often late and at an advanced stage, with an average delay of 40.5 months. Histological sampling and immunohistochemical results confirm the diagnosis. Most patients are diagnosed with stage II disease or higher, so it is considered to have a poor prognosis. There is no proper management for AABC; it follows the guidelines for orthotopic pectoral breast cancer. We therefore report the case of a 50-year-old woman diagnosed with grade II invasive ductal carcinoma found in accessory axillary breast, treated with neoadjuvant chemotherapy followed by a wide local resection and axillary lymph node dissection.

**Keywords:** Breast carcinoma. Invasive ductal carcinoma. Breast surgery. Case reports.

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# DUCTAL IN SITU ARISING IN FIBROADENOMA OF THE BREAST

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Fibroadenomas are common benign tumors of the female breast. In the appropriate clinical treatment, they are managed without excision, rarely a carcinoma arising within a fibroadenoma. We presented the case of a ductal carcinoma *in situ* (DCIS) arising in a fibroadenoma. We present a case of a 62-year-old woman with an isolated lump, no palpable, in her right breast that underwent a core biopsy, and histological findings of the lesion revealed a DCIS within a fibroadenoma. After 4 years (in 2021) without realizing mammography, by screening, she underwent mammography and ultrasound and was characterized as ACR BI-RADS category 4. The matologist should be aware of the possibility, particularly in older women, to inform the rationale for prompt surgical evaluation and follow-up of all breast masses. Mammography revealed a 1.4 cm mass on the right upper outer without microcalcifications. An ultrasound revealed a solid mass, hypoechoic, 1.4×0.7×1.1 cm, micronucleated. A core biopsy showed a biphasic neoplasia (fibroepithelial): a diagnostic suggestive of fibroadenoma with colonization of DCIS, cribriform, high grade, measuring 2 mm. Immunohistochemistry: ER: POSITIVE: 90–100%. PR: 90–100%. CerbB-2/Her2-neu score 0: negative. Lumpectomy: all margins greater than 2.0 mm: HYALINIZED FIBROADENOMA WITH USUAL DUCTAL HYPERPLASIA (06×04 mm)

SCLEROSING ADENOSIS

ALTERATIONS AND HYPERPLASIA OF COLUMNAR CELLS.

Questions:

1. Benefit from radiation therapy.
2. Value of tamoxifen or aromatase inhibitor.
3. Surveillance and follow-up.

**Keywords:** Breast cancer. Ductal carcinoma *in situ*. Fibroadenoma.

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# PRIMARY ANGIOSARCOMA OF THE BREAST: A CASE REPORT

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A 39-year-old woman presented to our mastology session with complaints of a right breast lump in 2014, which had grown very slowly and changed in color over the past year (purple). On physical examination, the breast was found in a 12-1 o'clock position, bruise-like, and soft-to-firm in consistency. On mammography, the lump presented diffuse-dense and ultrasonography showed an ill-defined mass and poor-delimited hyperechogenic infiltration in the upper inner portion of the right breast that measured about 7 cm in size. A core biopsy was performed on the suspicious lesion. The pathological result was necrotic breast tissue. A second core biopsy was performed with the diagnosis of malignant neoplasia, poorly differentiated. The immunohistochemistry was diagnosed with moderate-differentiated angiosarcoma. A modified mastectomy was performed and the initial diagnosis was confirmed. After that, she received adjuvant chemotherapy, but the treatment was interrupted due to epístaxis, hematemesis, and body paresthesia. After this, the progression of the disease was observed with metastasis in the lungs, stomach, mouth, gum, and brain. She was subjected to palliative treatment and died in November 2015. Discussion: Primary angiosarcoma of the breast is a very rare disease and corresponds to less than 1% of breast malignancies. Mammary angiosarcoma should be differentially diagnosed from benign hemangiomas, phyllodes sarcomas, stromal sarcomas, metaplastic carcinomas, fibrosarcomas, liposarcomas, squamous cell carcinomas with sarcomatoid features, myoepitheliomas, fibromatoses, and reactive spindle cell proliferative lesions. CD31 is a sensitive marker for this class of cancers, and CD34 positively ranges from 40% to 100%. These markers could help with the accurate diagnosis of angiosarcoma. Pathologically, these tumors are divided into three groups according to the classification proposed. Well-differentiated (grade I) tumors consist of anastomosing vascular channels that invade the surrounding breast tissue. Moderately differentiated (grade II) tumors have more solid neoplastic vascular growth and an increased mitotic rate. Poorly differentiated (grade III) lesions have obvious sarcomatous areas and areas of necrosis, hemorrhage, and infarction. In conclusion, primary mammary angiosarcoma is a rare neoplasm of the breast that affects a younger female population, compared to breast carcinomas, and has aggressive clinical behavior. Difficult differential diagnoses, due to atypical characteristics, can delay management.

**Keywords:** Angiosarcoma.

