CASE REPORT
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The challenging diagnosis of granular cell tumor of the breast: a case report

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ABSTRACT

Conventional granular cell tumors, derived from Schwann cells, occur in soft tissues and are mostly benign. It is also recognized as Abrikossoff's tumor or granular cell myoblastoma, and the most common locations are found in the head, neck, arms, esophagus, and respiratory tract. The incidence in the breast is rare, representing only 8% of granular cell tumors. However, it is important to consider it as a differential diagnosis when investigating breast nodules due to its misleading presentation. This is a challenging diagnosis considering that the clinical examination and imaging workup may suggest signs of malignancy. Therefore, the lack of histopathological analysis may lead to erroneous conclusions and therapies. Due to non-specific imaging and physical examination findings, a biopsy of the lesion is mandatory for diagnosis. The tumor's microscopic criteria consist of the presence of large polygonal cells, with eosinophilic, granular, and abundant cytoplasm. The cell borders are indistinct and the growth pattern is infiltrative, with perineural and possible perivascular involvement; however, mitotic figures are rare. The present case report demonstrates the importance of anatomopathological analysis for this diagnosis. It refers to a female patient, 28 years old, complaining of a breast node. She was followed up in the Mastology Department for further investigation, with a mammography report identifying a speculated nodule, with undefined margins, classified as Bi-Rads 5 in the right breast, and an ultrasound reporting a Bi-Rads 4C solid nodule. The clarification was made through biopsy, which determined microscopy compatible with the rare tumor of granular cells in the breast, in addition to the immunohistochemical profile, which differentiated the tumor variant of non-neural origin, composed of ovoid cells with eosinophilic granules, presenting nuclear pleomorphism, atypia, and mitotic figures.

KEYWORDS: granular cell tumor; breast tumor; breast neoplasms; Schwann cells.

INTRODUCTION

Conventional granular cell tumors occur in soft tissues and are mostly benign[1]. It is also recognized as Abrikossoff's tumor or granular cell myoblastoma, whose most common locations are the head, neck, arms, esophagus, and respiratory tract[2,3]. The incidence in the breast is rare, representing only 8% of granular cell tumors[3]. However, it is important to consider it a differential diagnosis when investigating breast nodules due to its misleading presentation. After all, conventional granular cell tumors of the breast may mimic malignant tumors, both in clinical manifestation and in imaging examinations, leading to diagnostic errors and inadequate radical treatments[2].

On mammography, a granular cell tumor may reveal a solid nodule with spiculated or irregular margins, and on ultrasound, it may define a heterogeneous, vascularized nodule, with anisotropy and acoustic shadow, determining non-specific findings more associated with malignancy[1]. Therefore, as imaging tests do not exclude a malignant neoplasm, the differential diagnosis can be challenging and induce major psychosocial disorders in the patient. As a rule, definitive identification depends on the anatomopathological analysis of the lesion[4]. In macroscopy, it appears as an irregular and firm mass, with or without skin retraction and nipple inversion[3]. Microscopically, it is characterized by the composition of epithelioid cells with granular eosinophilic cytoplasm with abundant lysosomes[5].

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CASE REPORT

A 28-year-old female patient was admitted to the Mastology service at a regional hospital in Sete Lagoas, Minas Gerais, complaining of a nodule in her right breast, which she initially noticed six months ago. She claimed to be previously healthy, without comorbidities or allergies. Furthermore, she reported a history of two previous pregnancies, the last one in 2020 with breastfeeding for a year. Her menarche was at age 12, and she currently has regular cycles, using a copper intrauterine device (IUD) implant since 2021. Regarding her family history, she reported an aunt with ovarian cancer and two uncles with bowel cancer.

In a subsequent ultrasound examination, a breast imaging reporting & data system (Bi-Rads) 4C nodule was diagnosed, identifying a solid, hypoechoic, spiculated, non-circumscribed nodular image, with a posterior acoustic shadow, located in the retroareolar region of the right breast, measuring 1.8 x 1.9 x 1.3 cm. The mammogram, performed some months later, presented a poorly defined spiculated nodule in the right breast, with Bi-Rads 5 classification, and another nodule in the left breast with Bi-Rads 2 characteristics. Following the propaedeutic investigation, a guided core biopsy was performed using ultrasound. The result indicated a granular cell tumor.

A sectorectomy of the right breast was performed on the patient, with total resection of the tumor. The macroscopic examination revealed a firm, brown nodule measuring 2.5 x 2.4 cm, located 0.3 cm from the deep margin (Figure 1). The microscopy confirmed the diagnosis of neural granular cell tumor, with proliferation of polygonal cells, without atypia, with large and granular cytoplasm supported by dense, fibrous connective tissue, and no signs of malignancy (Figures 2 and 3).

An immunohistochemical study was requested, which demonstrated the panel: AE1AE3 antigen and AE1/AE3/PCK26 antibody negative; CD68 antigen and KP-1 antibody positive; negative GATA3 antigen and L50-823 antibody; negative P63 antigen and 4A4 antibody; and S100 antigen and positive polyclonal antibody.

The patient evolved in good general condition, without lymphadenopathy or phlogistic signs on post-operative examination. She was advised about the rarity of the condition and the need for follow-up with a new ultrasound in six months.

DISCUSSION

The conventional granular cell tumor, derived from Schwann cells, is most common in soft tissues, mainly found in the head, neck, arms, or chest wall. Its occurrence in the breast is rare, representing

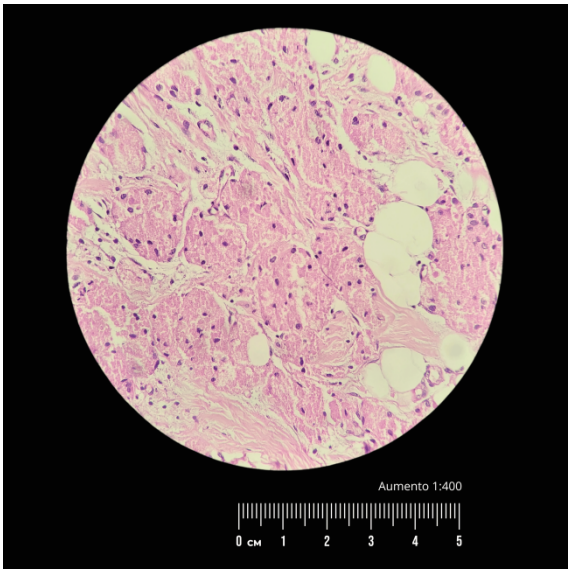

Figure 2. Microscopy of the lesion.

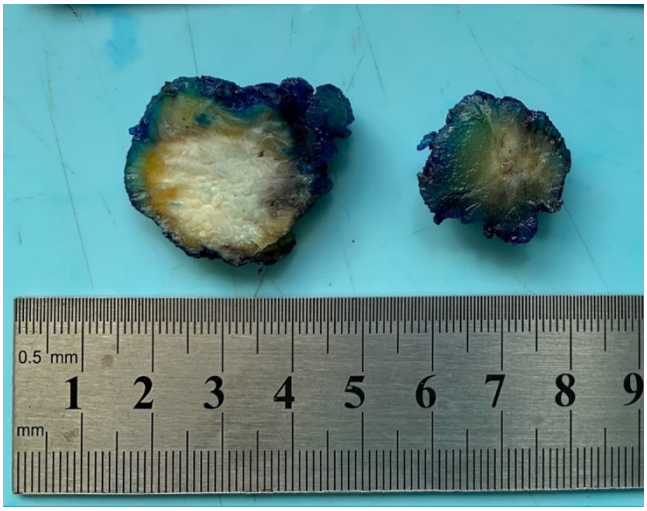

Figure 1. Macroscopy of the lesion.

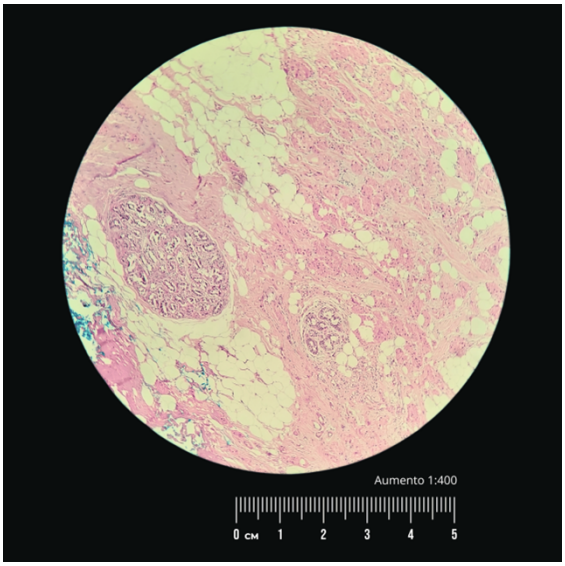

Figure 3. Microscopy of the lesion.

less than 10% of all granular cell tumors[5,6]. Considering tumors that affect the breast in general, granular cell tumors represent less than 0.1%[5,6]. Regarding the incidence in malignant form, it represents 1% to 2% of the category[1,3,5]. Epidemiologically, the tumor affects more women, across a wide age range from 19 to 77 years, and when it eventually affects men, it's more common in young adults of African descent[3].

Thus, granular cell tumors, which represent 1 in every 1,000 breast tumors, should be considered as a differential diagnosis for the investigation of breast nodules[3]. Mainly, because it is a challenging diagnosis considering that the clinical examination and imaging exams can suggest signs of malignancy, and the lack of histopathological analysis may lead to erroneous conclusions and therapies[2,5,7]. Therefore, due to non-specific imaging and physical examination findings, the lesion biopsy is mandatory for diagnosis[1,2].

The microscopic criteria of this tumor consist of the presence of polygonal large cells, with eosinophilic, granular, and abundant cytoplasm[3,5]. The cell borders are indistinct and the growth pattern is infiltrative, with perineural and perivascular possible involvement; however, mitotic figures are rare[3]. The present case obtained decisive histological confirmation with core biopsy analysis and the biopsy after the right breast sectorectomy. After all, the imaging tests were suggestive of malignancy, with a Bi-Rads 5 report mammography, and an ultrasound, with a Bi-Rads 4C result.

The variant of granular cell tumor of non-neural origin, unlike the conventional presentation, is composed of ovoid cells with eosinophilic granules, presenting nuclear pleomorphism, atypia, and mitotic figures, conferring a greater potential for lymphatic dissemination[8]. Immunohistochemistry is essential to determine a differential diagnosis, as the non-neural tumor is negative for S100 protein and other neural or melanocytic markers[9].

The immunohistochemical profile of conventional granular cell tumors shows positive for S100, CD68, CD63 (NKI/C3), and NSE, which may be related to cytoplasmic lysosomes reactivity, but the Ki-67 proliferation index is usually low[3]. As 10% of malignant cases are also positive for the S-100 marker, it is essential to search for other markers, such as CD68, which demonstrates lysosomal activity associated with the perineural Schwann cell[10]. In the reported case, we have a corresponding panel result, showing positivity for S100 and CD68.

The recommended treatment for the case is local surgical excision with free margins, without total mastectomy or sentinel lymph node biopsy, due to its mostly benign nature[2,3,10]. The prognosis for granular cell tumors of neural origin is good, and the recurrence rate is less than 10% after resection with appropriate margins[2,3,10]. The statistics regarding non-neural granular cell tumors are also positive, characterized by an indolent evolution, despite some worrying histopathological signs[9]. However, the malignant form can metastasize, including distant dissemination, which requires attention to worse prognostic characteristics of conventional granular cell tumors, such as a size greater than 5 cm, pleomorphism, prominent nucleoli, mitotic figures and necrosis[5].

CONCLUSIONS

The correct diagnosis of a conventional granular cell tumor of the breast is decisive for its psychosocial impact and for defining appropriate therapeutic management. It is a rare pathology, mostly benign, but challenging to diagnose. Due to non-specific imaging and physical examination findings, histopathological study is mandatory to rule out malignancy, along with immunohistochemical analysis of the lesion, which is important to differentiate from non-neural granular cell tumor.

AUTHORS' CONTRIBUTIONS

JFAR: Conceptualization, Data curation, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing. GJS: Conceptualization, Data curation, Investigation, Supervision, Visualization. AT: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Supervision, Visualization, Writing – review & editing. AALL: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Supervision, Visualization, Writing – review & editing. CASR: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – review & editing.

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