

ONCOPLASTIC TRAINING IN THE UK AND PERSPECTIVES FOR THE FUTURE

Treinamento em oncoplastia no Reino Unido e perspectivas para o futuro

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INTRODUCTION

The delivery of breast services in the UK has undergone fundamental changes over the last 30 years, driving up standards of practice and improving outcomes across the board. At the same time, the quality and variety of surgical techniques available has changed beyond all recognition, with the emergence of a wide range of new oncoplastic (OP) techniques that are now freely available to all National Health Service (NHS) patients. The development and implementation of an innovative model of cross-speciality training in the UK was one of the most important factors underlying this remarkable achievement. Quite by chance, a number of unanticipated events converged almost simultaneously, each one playing a vital role in guiding and accelerating changes in training and service delivery. A closer look at these events will help to provide some insight into the UK experience.

INCREASING SPECIALISATION

The introduction of the UK NHS Breast Screening Programme in 1988 was the catalyst that triggered off a range of inter-related developments. These included the formation of a new Breast Group within the British Association of Surgical Oncology. This nascent professional body represented the increasing number of specialist breast surgeons, and was responsible for the development of a raft of clinical practice guidelines, backed up by a framework of quality assurance and accreditation to underpin the emergence of a new generation of specialist breast units. Inevitably, this development led to much greater specialisation in breast surgery, with the gradual loss of the traditional skills of the general surgeon. These were slowly replaced by new skills in OP and reconstructive surgery, reflecting and driving the growing popularity of these techniques. OP guidelines were published for the first time, describing the options available in OP surgery and expected outcomes, establishing a new set of standards¹.

CHANGING EXPECTATIONS

The following decade saw a big rise in demand for access to OP services, as a result of much greater patient, public and professional interest in these techniques. For the first time, national guidelines relating to the management of early breast cancer stated that patients facing mastectomy had the right to be offered immediate breast reconstruction and OP repair of resection defects². This was a real turning point in the evolution of OP surgery in the UK, but the number of skilled breast and plastic surgeons was insufficient to meet a rising demand. Only a handful of breast surgeons had acquired these skills, and of the 300 consultant plastic surgeons with responsibility for a population of almost 60,000,000 people, nearly all were expected to cover a wide range of other more general plastic procedures.

A LOOMING CRISIS FOR BREAST SURGERY

By the late 1990's, breast surgery was facing a real crisis. Few trainees in general surgery were choosing to sub-specialise as breast surgeons, and a national survey confirmed that the lack of technical challenges, low levels of operative satisfaction and high levels of clinical stress were the root causes for its low popularity³. General surgical trainees no longer had the opportunity to acquire the much wider range of skills enjoyed by their predecessors, as a result of foreshortened training programmes and the European Working Time Directive, both of which limited opportunities to gain experience. Those trainees selecting breast surgery highlighted the need to develop more advanced breast-specific skills, including breast reconstruction, a skill prioritised by 80% of respondents.

The National Breast Group addressed this looming crisis by coordinating three key developments, signalling the birth of OP surgery in the UK:

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- A new national portfolio of comprehensive cadaver-based courses for teaching key steps in OP and reconstructive surgery in a laboratory setting. This was an outstandingly successful development, which remains very popular nowadays;
- A new sub-speciality Breast Curriculum was developed by the Breast Group and endorsed by two statutory bodies in the UK: the Joint Committee for Specialist Training in General Surgery and the General Medical Council. For the first time, breast surgeons in training were expected to acquire a wide range of competencies in OP and reconstructive techniques. This was the first curriculum in Europe to include OP skills as an integral part of a breast surgeon's training;
- Informal cross-speciality training arrangements that existed between breast and plastic surgeons were formalised when an Oncoplastic Training Interface Group (TIG) was established in 2000. The group included representatives of both parent Associations and this seminal event marked the birth of the Oncoplastic Breast Surgeon, trained in all aspects of diagnosis, resection, reconstruction and oncological management. The agreed aims of the TIG were to
 - Improve service to patients by facilitating interface training;
 - Develop cross-speciality training for registrars and consultants;
 - Provide training for more junior surgeons.

SUSTAINING AND SUPPORTING OP TRAINING

The falling popularity of breast surgery coincided with a rising demand for specialist breast surgeons at a time when women were increasingly becoming more aware of their right to be offered breast reconstruction. As a result, breast surgery was designated a 'shortage speciality' by the Department of Health, which was looking for innovative solutions to improve recruitment. The TIG grasped this opportunity, submitting a proposal for national funding of nine new Oncoplastic Fellowships at a cost of *circa* £ 500,000 per annum. Large Regional OP centres were chosen to host the Fellowships following a competitive national selection process. Key criteria for selection included staffing by a full complement of breast and plastic surgeons working together, enabling comprehensive training in a full range of OP procedures, backed up by an active programme of audit and research. The Department of Health continues to fund this scheme today, which has trained more than 100 Fellows from a background of breast and plastic surgery over the last 15 years. These post-holders have personally performed an average of 100 major OP procedures during their Fellowship year. More than 80 have been appointed as consultant OP surgeons, and most are now involved in training the next generation.

Collaboration between breast and plastic surgeons through their Associations continues to strengthen and sustain the

OP project. The successful implementation of a centrally funded National Mastectomy and Breast Reconstruction audit (NMBRA) of >5,000 reconstructions in 2008⁴ was followed by the development of new OP guidelines in 2012⁵. Both were major projects that would have failed without robust cross-speciality collaboration and support. The NMBRA reported unexpectedly high rates of infection, implant loss and readmission, and generated more than 60 new indicators of good practice. This large-scale audit also disclosed significant variations in access to reconstruction across the UK, with rates varying between 10–43%⁶. These inequalities are being addressed as increasing numbers of trained OP surgeons are securing consultant appointments. The key quality standards that underpin the new OP guidelines⁵ are aimed at improving access, reducing post-operative pain and avoiding the high complication rates disclosed by the NMBRA.

THE BREAST-PLASTIC PROFESSIONAL INTERFACE

The relationship between breast and plastic surgeons has been 'sinusoidal' over the last two decades, but with more peaks than troughs. Both specialities have grown to appreciate the 'win-win' outcome of cross-speciality training and working. For breast surgeons, this has resulted in the acquisition of OP skills for breast conservation and immediate reconstruction at the time of mastectomy. For plastic surgeons, the gains have included more cross-speciality referrals for free flap reconstruction and revisional surgery, as well as closer multi-disciplinary working.

Both groups have benefitted from more sophisticated training initiatives, such as the Master's Degree in OP Surgery. Developed by the University of East Anglia, this is a modular programme backed up by tutor-moderated on-line discussion and hands-on courses⁷. Above all, patients are benefitting from much more information and choice, and from more frequent cross-specialty referral when indicated or requested.

EUROPEAN DEVELOPMENTS

The provision of OP services and the training and type of surgeon providing these services varies enormously from country to country in mainland Europe. Surgeons come from widely different backgrounds including general surgery, surgical oncology, gynaecology and plastic surgery, and work both independently or in a team. The European Society of Mastology (EUSOMA) has been instrumental in establishing standards by developing a common framework of quality assurance and accreditation for organisations providing breast services. This framework has been endorsed by the European Breast Specialist Societies, and is being adopted by increasing numbers of multi-disciplinary teams.

The process began in 2000 with the publication of European guidelines that established the requirements for specialist breast units⁸. This was followed in 2007 by a second EUSOMA publication defining new standards for the training of specialised health professionals. For the first time, this established a requirement that breast surgeons should be trained in reconstruction⁹. Finally, EUSOMA produced a more detailed document in 2013 updating the requirements for specialist breast services. This document underpins a new Europe-wide process for the quality assurance and accreditation of breast centres¹⁰. As part of the process of accreditation, centres must provide evidence that both breast reconstruction and OP breast conservation are provided 'in-house'. Twenty-six European breast centres have been able to meet this standard to date and have received official accreditation, and this number continues to rise.

These developments have recently been recognised and supported by the European Union of Medical Specialists, which has laid down the requirements for a Specialist Certificate in Breast Surgery¹¹. Regular examinations are held to assess training, knowledge, skills and experience, including OP experience. This certificate is fast becoming a 'must have' qualification, raising standards of training and OP surgery right across Europe.

CURRENT TRENDS

Changing the curriculum to include reconstruction 20 years ago continues to have a profound effect on the availability and variety of OP techniques currently used in the UK. Today's curriculum for general surgeons¹² still requires trainees with an interest in breast surgery to be 'emergency safe'. This limits the time available for them to acquire more complex skills in reconstruction, including pedicle and free-flap autologous techniques. As a result, the skill base of a new consultant today is mainly limited to implant-based techniques and increasingly the use of OP breast-conserving surgery, including volume replacement and volume displacement.

For patients, implant reconstruction is an attractive option, with a short hospital stay, less risk, less disability and a quicker recovery, when compared with more complex flap-based techniques. For surgeons, implant reconstruction is less technically demanding, the procedures are quicker, and the avoidance of major flap-based complications greatly simplifies post-operative care. For hospitals, performing implant reconstruction brings financial and logistic benefits, with faster theatre procedures, a higher throughput of cases and a shorter post-operative stay, compared with more complex techniques. The recent introduction of the acellular dermal matrix (ADM) for lower pole implant cover remains a key factor accelerating the use of implant-based reconstruction. The use of implants accounted for 55% of all reconstructions in the UK in 2014¹³ and 80% of all reconstructions in

the US by 2016¹⁴. The higher rates recorded in the US may reflect the more generous reimbursement allowed for implant compared with flap-based techniques¹⁵.

These trends give cause for concern. Although the longer-term outcomes of ADM/implant techniques are largely unknown, the superior clinical and patient-reported outcomes following autologous compared with implant reconstruction have been clearly demonstrated up to 20 years following the original procedure¹⁶⁻¹⁸. In the long run, the 'quick fix' offered by implant reconstruction and favoured by many patients, surgeons and healthcare providers may prove to be a 'ticking time bomb'. Year-on-year, unplanned revisions for implant loss, reconstruction failure or poor cosmetic outcome have been shown to escalate almost exponentially¹⁹.

FUTURE CHALLENGES

The substantial rise in the popularity of OP surgery is creating new challenges for clinicians, service providers, and patients alike.

A need for better outcome data

The increase in the number and variety of techniques reported in the literature is taking place without good quality outcome data to inform treatment decisions. Much of the data quoted is based on Level 2/3 evidence from cohort studies or systematic reviews, or Level 4/5 evidence from small retrospective case series or expert opinion. One of the largest systematic reviews of OP surgery published to date included more than 42,000 cases of reconstruction, and concluded that 'at present the breast reconstruction outcome literature is inconsistent, and lacks methodological rigor... a core outcome dataset is strongly recommended'²⁰.

Recently, a number of new initiatives have been launched in the UK to address this problem. Progress was first made with the prospective NMBRA of more than 5,000 patients, which disclosed significantly better patient-reported outcomes following autologous reconstruction compared with implant techniques, 18 months following surgery⁴. Another national database (the Hospital Episode Statistics Database) more recently reported significantly lower revision rates following autologous *versus* implant reconstruction in nearly 14,000 patients²¹. These results have been further validated by a prospective multicentre cohort study of more than 2,000 patients undergoing immediate implant or implant/ADM reconstruction in more than 80 centres: the UK iBRA study²². This study has recently disclosed an unexpectedly high complication rate, with 18% of patients requiring an unplanned return to theatre by three months, and the longer-term outcomes of implant-based procedures are awaited.

These and other initiatives are beginning to inform evidence-based practice, but many more are needed to drive up standards and to help patients make informed choices. In future, full discussion and frank disclosure about risks and benefits of different

techniques should be mandatory and is likely to influence the prevailing trend towards implant-based reconstruction.

More objective decision-making tools

New tools are becoming available which have the potential to transform the identification of those patients most likely to benefit from OP breast conservation. The recent description of 'core datasets' to identify these patients (e.g. BCCT.core²³) is leading to the development of much more sophisticated tools to predict the aesthetic outcomes of breast conservation.

An example of this is the PICTURE™ project²⁴ which uses software to 'fuse' individual patient's data, generated from multiple sources (patient and tumour-specific data, 3D photography, prone MRI and MR elastography) to create an 'avatar' of post-operative appearance. The patient is then able to see images of her predicted appearance following straightforward breast-conserving surgery. These will help her decide whether she wishes to undergo a more complex OP procedure to prevent the likely deformity. This novel approach will help to bring much greater objectivity to pre-operative decision-making.

Extending the OP skill-base to reduce mastectomy rates

Many of the longer-term problems associated with total mastectomy and implant reconstruction (progressive asymmetry, capsule formation, implant failure, extrusion, multiple surgical revisions, etc.) may be minimised or avoided altogether by greater use of OP conservation techniques. These are already extending the role of breast conservation in the UK, and their use has increased from 1 to 6% of all breast-conserving procedures between 2000–2014²⁵. Their popularity is likely to escalate further still as the indications for breast conservation are extended to include larger, multi-centric tumours, traditionally treated by mastectomy²⁶.

A recent decision by the UK Specialist Advisory Committee for General Surgery will allow future general surgical trainees with a sub-speciality interest in breast surgery to spend the final two years of their training programme focusing exclusively on breast disease, including the acquisition of advanced oncological and OP skills. This seminal decision will extend the portfolio of breast surgeons, and will equip them with the skill-base necessary to perform many of these new mastectomy-avoiding procedures.

Cost-containment and new ways of working

Greater use of OP and reconstructive procedures is increasing the financial challenges of delivering increasingly sophisticated specialist care today. Costs are destined to escalate, with up to two-thirds of breast cancer patients in the US undergoing contralateral risk reducing surgery, often combined with immediate reconstruction¹⁴. In the US²⁷, Northern Europe²⁸ and elsewhere²⁹, the use of risk-reducing bilateral mastectomy and immediate

reconstruction for high genetic or familial risk is also increasing. In the UK, the overall cost for this procedure is around £15,000³⁰. This is considerably more than the costs of other forms of risk-reduction, including endocrine manipulation and bilateral salpingo-oophorectomy. In future, decisions about funding for these major OP procedures may depend on health economics — such as the cost per Quality Adjusted Life Year (QALY), compared to other risk-reducing options.

Limitations to the maximum number of OP procedures that the UK NHS will be able to afford are currently under consideration. Funding is already restricted to a maximum of two procedures in some parts of the country. Providing high quality evidence that demonstrates the cost-effectiveness of OP surgery — based on clinical and patient reported outcomes — is an urgent challenge for current and future generations.

Finally, for closer working relationships between breast and plastic surgeons to be successful, traditional territorial boundaries need to be broken down further still. Much has been achieved, with interface fellowships³¹, a joint OP Masters degree⁷, joint national audits^{4,22}, and joint oncoplastic guidelines⁵, resulting in more integrated, streamlined care. In spite of these efforts to promote integration, much remains to be done. Recent evidence suggests that breast surgeons in the UK extended their OP skill-base between 2010 and 2015, with 75% requesting further training. But the skill-base of plastic surgeons remained static during this period, with only 27% requesting further training³¹. If this trend continues, OP conservation and breast reconstruction will be carried out more and more by breast surgeons as they become increasingly skilled at the full range of procedures, with the exception of free-flap techniques requiring the microvascular skills of plastic surgeons.

CONCLUSIONS

OP surgery is now widely available in the UK as a result of a range of cross-specialty developments that have created an integrated model of care. This initiative would have failed without the early commitment of a small group of breast and plastic surgeons who were willing to work together to develop a new sub-specialty, with a patient focus. The model is now evolving asymmetrically, with breast surgeons beginning to perform most of the OP surgery, in spite of repeated attempts to create a 'generic' OP service with equal input by breast and plastic surgeons.

This situation has emerged because most breast surgeons have given up their general surgical practice and became totally committed to the concept of OP surgery and the acquisition of new skills. In contrast, plastic surgeons remain relatively scarce in the UK, and are expected to retain a range of general plastic skills to enable them to provide both elective and emergency services. This is limiting their opportunities for cross-specialty practice, even for those with OP training and skills. Their more

traditional role performing autologous breast reconstruction is however expanding, with a much greater awareness of the indications for these more complex techniques, and increasing requests to salvage failed implant reconstructions.

The UK is fortunate to enjoy a world-class OP service as a result of two decades of cross-speciality cooperation, central

financial support and national training initiatives. It is hoped that our experience will provide a useful template for other countries and healthcare systems seeking to develop an integrated OP service. Continued professional commitment and bilateral support are the most important ingredients for a service to thrive and respond to future challenges.

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