Skin-sparing mastectomy

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Oncoplastic breast surgery has been defined as provision of appropriate cancer resection, skin-sparing techniques, reconstruction with a full range of techniques – both immediate and delayed – for wide local excision and mastectomy, and correction for any resultant breast asymmetry using implants/expanders, reduction or mastopexy for the contralateral breast [1].

Conceived just over a decade ago, skin-sparing mastectomy (SSMx) with immediate breast reconstruction has truly been an advance for the benefit of women with breast cancer. The traditional legacy of ablative breast resection with modifications of the historical mastectomy incisions used transverse or oblique skin resections, aiming to minimise breast local recurrence as well as removing 'excess' skin and tighten the soft anterior chest wall tissue. The acceptance that breast reconstruction could be achieved at the same time as mastectomy has allowed innovation in mastectomy incision planning, deleting the traditional scar and facilitating individualised incision placement. Carlson described four main types of SSMx incision [2]. As the majority of breast cancers are now diagnosed preoperatively on core biopsy, most frequently used are circumareolar skin incision and the technique based on the reduction mammaplasty, the Wise pattern.

Fundamental to SSMx is patient selection and the anticipation of adjuvant treatment, particularly chemotherapy and radiotherapy. The main issue for the surgeon is the essential requirement not to leave behind any residual malignancy, which would lead to unacceptably high local recurrence rates. There is a body of publications based on cohort studies, usually with small patient numbers, and followed up for a limited time. There are no randomised controlled trials, few prospective data and few multi-centre reports. The largest series of 539 patients reported at 65 months' median follow-up reported local recurrence of 5.5%. 30.6% of the cancers were non-invasive, in-situ disease [3]. In this study local recurrence with SSMx was related to tumour grade, size, the presence of lymphovascular space invasion and node positivity, all conventional prognostic factors. Other studies have found similarly acceptably low rates – but in all the patients were highly selected for SSMx, and rates of adjuvant radiotherapy and chemotherapy were inconsistent. What seems appropriate is that SSMx be offered to those women with the smaller and good prognostic tumours, multifocal in-situ disease being the closest application demonstrating this. The role of SSMx in more advanced disease, such as T3, is less clear. Certainly inflammatory breast cancer is more appropriately managed by conventional skin-removing mastectomy without immediate breast reconstruction. We do not know the place of SSMx after neoadjuvant chemotherapy to diminish tumour size.

Increasingly women are being offered radiotherapy after mastectomy, usually for grade, size and nodal involvement. There are few data on the effect of radiotherapy on the SSMx and the aesthetic and functional outcome of immediate breast reconstruction. A randomised trial, the QUEST study, has been launched in the United Kingdom that will look at the outcomes comparing implant-assisted LD flap immediate reconstruction and autologous LD flaps. Radiotherapy effects and quality of life will be studied.

What is clear is that the factors that promote local recurrence should be well regarded and considered in the planning of SSMx or conventional mastectomy. The use of sentinel node biopsy increasingly allows a majority of women to avoid full axillary node clearance. In some units the sentinel node procedure is undertaken electively at a time before the SSMx, as node positivity and its extent does have an impact on postoperative radiotherapy use.

The whole range of breast reconstruction techniques is used in conjunction with SSMx. These are tissue expanders, and implant-based techniques and myocutaneous tissue flaps. These may be pedicled, such as the latissimus dorsi (LD) flaps and the now less frequently used transverse rectus abdominis myocutaneous (TRAM) flaps, and increasingly the microvascular free flaps, particularly the deep inferior epigastric (DIEP) abdominal tissue flaps. In some units other flaps such as those from the buttocks (SGAP,

IGAP flaps) or inner thigh (TUG flaps) are some of the surgical options available.

The aim of SSMx is both to treat the cancers effectively and to optimise aesthetic, cosmetic and functional outcome. As women are increasingly surviving longer after breast cancer diagnosis, and in many cases may be considered 'cured', so the visible and functional long-term issues become even more important. The possible future need for further surgery, scar or implant revision for example, need to be part of the consent process at the outset. The surgeon and team need to have the tools to plan and deliver surgery in meticulous manner with close attention to detail, and with care to optimise aesthetic as well as oncological long-term results. Precision of technical surgery is mandatory for SSMx to be delivered with minimised complications and low revision surgery rates. Breast skin flap necrosis is a risk that has been reported at an incidence of 11% [3]. Breast skin necrosis is difficult to manage and has an impact in a major way, not only in the delay of necessary adjuvant therapy but also in cosmetic outcome, and should be avoided at all costs. In many cases surgeons trained in oncology surgery as well as breast plastics and reconstruction can provide the whole surgical remit, in other departments teams of those with the appropriate surgical skills and experience can focus on delivering care to the individual woman. What is important is that the care delivered should be within the concept of a full multidisciplinary team, including the whole adjuvant therapy oncology team, breast specialist nurses and pathologists.

Skin-sparing mastectomy occupies the common ground between surgical oncology and plastic and reconstructive breast surgery. Guiding principles of cancer surgery are layered with understanding of aesthetics – breast volume, shape, skin surface area, ptosis, base diameters and unique nipple areola morphology and colouring.

For women with diagnosed breast cancer traditional surgical thought dictates removal of the nipple areola complex (NAC). This has a huge impact on the cosmetic result. Techniques of NAC reconstruction are sophisticated and commonly involve local flaps and tattooing as a final procedure. But some units have advocated preservation of the natural NAC, with low NAC involvement on pathology in women diagnosed with non-invasive in-situ disease [4]. Whether or not the NAC can be safely conserved in women with invasive breast cancer is not clear: a number of studies are underway, but based again on cohorts, not randomised trials.

The importance of surgery in preventing recurrence and contributing positively to survival is recognised, and becomes more relevant with earlier diagnosis and smaller cancers. But additionally, SSMx is now an accepted intervention for risk reduction surgery for women at high risk of breast cancer, but who have not as yet been affected. The dramatic reduction in breast cancer incidence of over 90% in high-risk women by virtue of gene mutations and family history, affirms the continuing role of SSMx in this disease [5].

The increasing reality of long-term breast cancer survival drives the need to develop better cosmetic outcomes with associated improvement in quality of life. SSMx fulfills this need, but we rely on cohort studies from mostly single institutions – randomised controlled trials against conventional surgery will be difficult to achieve.

Conflict of interest statement

The author has no conflict of interest to disclose.

References

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