E4. Diagnosis and treatment of screen detected breast cancer

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New vacuum assisted mammotomy techniques and their role in the management of screen detected borderline lesions (Luc Steyaert)

The primary goals of image guided breast biopsy techniques are to minimise uncertainty and consequently patient anxiety, to establish a correct and early diagnosis and so avoid unnecessary surgery for benign lesions and facilitate single procedure treatment for malignancy.[1] Different minimally invasive techniques are available (fine needle aspiration cytology, core needle biopsy), and image guided procedures are mandatory nowadays since they provide evidence that the tissue sampling is adequately performed at the level of the visualised lesion; biopsy techniques guided by palpation should therefore be avoided. The introduction of Vacuum Assisted Biopsy Techniques (VAB) means that surgical open biopsies for diagnosis should now be considered exceptional.[1,2] Since the introduction of Mammotome® in 1994, several other vacuum assisted devices have been introduced. These include single insertion multiple sample devices and those that require multiple insertions.[2]

For borderline lesions like microcalcifications, and for very small suspicious lesions (<1 cm), the accuracy of the biopsy is improved by achieving larger sample size (ranging from 7 to 14 G), the aspiration of the tissue into the needle and 360º rotational directional sampling. Single insertion multiple sample devices are preferred because they provide better vacuum, greater precision because the needle does not have to be repositioned after each sample, and more rapid speed of operation. The reported complication rates for all vacuum devices are very low and the procedure is cost-effective because it is done under local anaesthesia on an outpatient basis.

Since the introduction of screening with mammography the main indications for VAB are foci of microcalcifications and irregular densities that are not visible on ultrasound. Most procedures are x-ray stereotactically guided, preferably on a dedicated prone biopsy table. Birads 4 and 5 lesions are the main indication but increasingly Birads 3 lesions are biopsied with VAM as the frequency of malignancy has been shown to be higher than expected using the VAB devices. VAM may also be used under ultrasound guidance where the abnormality is clearly visible using this imaging method.[3] Microcalcifications and abnormal densities can frequently be found by consequent ultrasound exams with modern high end equipment, enabling ultrasound guided VAB to be performed, which is more comfortable for the patient and provides better real-time control of the procedure. MRI guided VAB can also be performed for enhancing lesions not found on ultrasound of mammography. VAB is also increasingly being used for therapeutic excision of benign lesions, such as fibroadenomas and pipillomoas like fibroadenomas.[3,4]

VAB is a reliable and effective tool for the diagnostic workup of breast lesions and the newer devices have significantly increased the utility of this method of breast diagnosis by providing pathologists with sufficient material to provide accurate diagnosis.

Assessing prognosis of screen detected breast cancer and predicting who needs aggressive treatment (Sarah Pinder)

It is well recognised that screen-detected invasive breast cancers are more often of low histological grade (grade 1) and smaller size than symptomatic counterparts. Consequently, the former are more frequently lymph node negative. However, ductal carcinoma *in situ* (DCIS) is also much more frequently identified in breast screen programmes (20% of screen-detected breast cancers) and small grade 3 cancers are also identified as a result of mammographic microcalcification within associated high grade DCIS.[5] Whilst some groups believe that screen-detected invasive carcinomas are inherently biologically different from symptomatic cancers, others maintain that it is their earlier detection that results in improved prognosis of these lesions. Nevertheless, there is agreement that the prognosis of screen-detected breast cancers is, in general, good and can be predicted by systems such as the Nottingham Prognostic Index[6] and Adjuvant online.

However, new systems for classifying invasive breast cancer can be applied to screen-detected, as well as symptomatic, disease. Breast cancers may be classified

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into sub-types by the patterns of expression of combinations of oestrogen receptor (ER)-regulated genes, growth factor receptors and basal cytokeratins.[7] As well as gene-profiling, such sub-types can be identified with immunohistochemical panels. A basal-like group, negative for ER, progesterone receptor and HER2, but either EGFR or basal cytokeratin positive (e.g. CK5 or CK14), has a high frequency of early systemic relapse and a poor prognosis, even if such lesions are small and screen-detected.[8]

Oncoplastic considerations for screen-detected breast cancer (Douglas Macmillan)

10 year survival of screen detected disease is estimated at 87%. Therefore, women do live a long time with the effects of breast cancer surgery on body image, quality of life and self-esteem. The degree to which these outcomes are affected is strongly related to the cosmetic outcome of surgery.

Breast conserving surgery is used to treat 74% of women with screen-detected invasive disease (68% for those with DCIS) in the UK. Studies show that 20–30% of women will be dissatisfied with the cosmetic results. Overall, however, satisfaction after breast conserving surgery is much higher than after mastectomy.

Many factors influence the cosmetic results of breast surgery. Patient selection and surgical technique are two important factors for which there is great scope for improvement. Enter oncoplastic surgery.

Oncoplastic surgery is a blend of breast oncological surgery with what traditionally is regarded as plastic surgery or cosmetic surgery and places as much emphasis on quality of life as it does on effectiveness of treatment. A guiding principle is that the latter must not be compromised, and if anything, should be enhanced.

Oncoplastic surgery does not necessarily mean complex surgery. A simple mastectomy performed to achieve a low scar with a flat surface to wear an external prosthesis perhaps with a contralateral breast reduction can be simple surgery that can offer much to an elderly woman who requires or chooses a mastectomy.

There is a wide spectrum of oncoplastic procedures. For screen-detected disease, certain areas in which oncoplastic surgery has a role can be summarised.

- Maximise the percentage of women who can be treated by breast-conserving surgery. Oncoplastic surgery can reduce the rate of margin involvement (by taking a wider margin) and allow breast conservation for lesions larger than traditional criteria would consider suitable.
- Minimise the percentage of women who are dissatisfied with the cosmetic results of breast conserving surgery. A variety of techniques can minimise deformity.
- Optimise availability and outcome of total breast reconstruction.
- Optimise breast form in those who have existing dissatisfaction with this. Procedures such as breast reduction or breast lift performed with cancer excision can confer positive quality of life outcomes in selected cases and avoid the radiotherapy effects on the larger breast.

Much research is underway and more is required to elucidate the potential that oncoplastic surgery can offer to the management of screen-detected breast disease. There is no routine assessment of cosmetic outcome or quality of life in screening programmes. Such measures are likely to identify the true potential of oncoplastic techniques and are required to monitor their application.

Conflict of interest statement

None declared.

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