Breast Cancer Online
www.bco.org

Breast Cancer Online, **10**(3), Page 1 of 3, ***e5***
doi:10.1017/S1470903107003501

ISSN 1470-9031

Focus On

For the use of ultrasound by surgeons

J. Michael Dixon, E. Jane Macaskill

Edinburgh Breast Unit, Western General Hospital, Crewe Road South, Edinburgh, UK.

Abstract There is an increasing demand upon radiology departments for use of ultrasound as part of triple assessment of symptomatic breast disease. It has been shown that in the context of proper training both surgeons and radiologists achieve comparably high diagnostic sensitivity and specificity with ultrasound. This article outlines the arguments in favour of the use of ultrasound by surgeons in the breast clinic for diagnostic and therapeutic purposes.

Keywords: Breast; diagnosis; roles; triple assessment; ultrasound

Introduction

The combination of an increase in mammographically detected, non-palpable lesions of the breast and advances in ultrasound technology have resulted in increased use of ultrasound scanning (USS) as part of assessment of the normal and abnormal breast. This has resulted in a sharp increase in demand upon radiology departments. Historically and politically ultrasound has been in the domain of radiology, but the use of ultrasound by radiologists or radiographers alone may not be that which best serves the patient, or the professionals involved. Many one-stop breast clinics struggle with increasing demand for USS, and the rise in mammographically detected lesions from the Breast Screening Programme has added to this increasing workload [1]. There has been no comparable rise in staffing in most radiology departments, and this has caused difficulties in providing an efficient service in many centres. While lack of personnel in one area, in this case radiology, should not result in distribution of this workload onto other members of the multi-disciplinary team, it has allowed reflection on the service provided by the whole team, and focused attention on how to provide the most proficient service for patients.

The use of USS by surgeons for diagnostic and therapeutic purposes has an established role in a number of surgical disciplines, with studies confirming safe and effective use of USS by surgeons for diagnostic and therapeutic purposes [2]. In the acute setting, focused assessment for the sonographic examination of the trauma patient (FAST) has been performed by surgeons for at least 10 years, with studies showing comparable sensitivity and specificity for surgeons trained in ultrasonography with ultrasound in the hands of radiologists [3]. With the increasing specialisation of surgeons in breast surgery, it is natural that the skill of ultrasonography, traditionally the province of the radiologist, be acquired by those who wish a more holistic approach to the treatment of their patients. The accuracy of ultrasound performed by breast surgeons has been confirmed in a prospective study from the Royal Marsden [4]. In this study surgeons performed ultrasound on patients who were also assessed by a radiologist, and on patients who were to undergo excision of a breast lump for diagnostic purposes. The results of surgeon-controlled ultrasound compared with radiologist-controlled examination and with the pathological diagnosis after excision were favourable, with complete concordance between radiologist and surgeon in 96% of cases. Ultrasound scans performed by the surgeon compared to histology

Correspondence to: J. Michael Dixon, Consultant Surgeon and Senior Lecturer, Edinburgh Breast Unit, Western General Hospital, Crewe Road South, Edinburgh, EH4 2XU, UK. E-mail: jmd@ed.ac.uk; Tel: +0131 537 2907; Fax: +0131 537 2653

Received 06/01/2006
Accepted 02/05/2007
BCO/350/2005/FO

had a sensitivity of 98.3% and specificity of 91.7%. In studies that have been published demonstrating comparable results of ultrasound performed by surgeons or radiologists, training and experience have been important aspects contributing to the accuracy of diagnosis. Formal training sessions in breast ultrasound are of value to both surgical and radiological trainees considering specialisation in breast disease, and a combined approach at this level would serve to improve interprofessional relationships.

On a practical level, it is worth considering the situations in which the authors have found ultrasound to be helpful in the surgical clinic, and to outline examples of how coordination of surgical and radiological skills can serve patients better. Assessment of breast abscesses and infection is often carried out following emergency referral and frequently occurs out with normal hours, at which time there is usually no specifically trained radiologist available to perform breast USS. Patients with a clinically inflamed breast with no obvious superficial collection should have an ultrasound scan performed to assess whether an abscess is present and, following identification of any localised abscess, appropriate therapeutic intervention such as needle aspiration following local anaesthetic infiltration can be performed resulting in swift relief of symptoms. This has now become the standard of care for the management of breast infection and we have shown that surgical trainees can perform the ultrasound with a high degree of accuracy [5].

In the symptomatic clinic, patients presenting with a lump that is considered to be benign on clinical examination and mammography can have the mass shown to be either cystic or solid on ultrasound scan performed by the surgeon in the consulting room, and a fine needle aspirate (FNA) performed to confirm cystic lesions. Aspiration of typical cyst fluid with disappearance of the presenting lump confirms the diagnosis, and allows the patient to be reassured and discharged without having to go for ultrasound in the radiology department. With a solid benign appearing lesion in younger women, a core biopsy can be performed with ultrasound guidance in the clinic, and confirmation of diagnosis made. For indeterminate lesions or lesions considered suspicious of malignancy we continue to advocate a diagnostic ultrasound performed by an experienced radiologist. Such an examination provides important diagnostic information not only on the nature of the lesion but any associated satellite foci, and allows nodal assessment at the same time. Until recently, most core biopsies and FNAs were performed freehand by surgeons, and this is still done in many units. However, it is clear that accuracy even in larger palpable masses is improved if the FNA or core biopsy is performed by ultrasound guidance. Surgeons are already expert in these techniques, and guiding a needle into these larger lesions with ultrasound is easy to learn and is to be encouraged.

For therapeutic purposes, lesions can also be excised under ultrasound guidance with new technology such as mammotome excision. There are published series of mammotome excision by both radiologists and surgeons. The mammotome has also been used to drain persistent localised abscess, saving the need for admission for incision and drainage [6]. Traditionally, axillary node assessment prior to any surgical procedure for staging has been based on clinical assessment with the surgeon performing a FNA or biopsy freehand on any suspicious nodes. The accuracy of assessment can be increased by the use of ultrasound imaging of the axilla or supraclavicular fossa nodes, with guided needle or core biopsy [7]. This can be performed in the new patient one stop clinic either by the radiologist or the surgeon when core biopsy of the cancer is performed, allowing earlier knowledge of nodal involvement, and more informed counselling of proposed and likely treatments.

With the advent of the new generation aromatase inhibitors, and the use of these in the neoadjuvant setting for large or locally advanced tumours, monitoring of these cancers should include not only clinical assessment but also regular ultrasound measurements. In studies in Edinburgh serial clinical, mammogram and ultrasound measurements allowed accurate monitoring of response with good intra- and inter-observer variability levels for the surgeons involved. USS performed by surgeons had a better correlation with the size of tumour at pathology than clinical or mammographic assessment, indicating USS as the most accurate modality [8]. In this setting it is also appropriate for patients who are thought to require neoadjuvant treatment, be that chemotherapy or hormone therapy, to have a tumour marker inserted at the time of diagnostic biopsy to save this having to be performed at a later date. Again our experience is that equally good results are obtained whether a surgeon or a radiologist places the marker.

While these outline some of the possible uses of USS by surgeons in the clinic setting, it should be stressed that the radiologist has an essential role in a number of situations. As outlined above where there is a probable malignancy, and accurate assessment and measurement of the lesion is important for surgical decision making then a formal diagnostic ultrasound by a specifically trained radiologist is indicated. Also in cases where clinical examination is indeterminate or shows localised nodularity, skill and experience is necessary to confidently state that, for example, an area of nodularity is in fact normal.

https://doi.org/10.1017/S1470903107003501 Published online by Cambridge University Press

Protocols for the use of USS should be developed within each unit based upon the strengths of the staff available. The boundaries between staff along traditional lines is no longer appropriate as radiologists now perform clinical examination, the new generation of breast physician provides a broad range of diagnostic skills, and breast surgeons continue to specialise and not only perform ultrasound but also breast reconstruction and oncoplastic procedures. The traditional skills of the radiologist or surgeon or physician should be less restricted to these titles and more tailored to the talents and interests of the individuals involved.

The use of ultrasound of the breast by a breast surgeon for diagnostic and therapeutic purposes is a useful and safe adjunct to current practice. It can provide a prompt diagnosis and relief of discomfort for some patients, allowing better diagnosis and more minimal intervention in the example of a breast abscess. For the radiologist, the pressure of increasing workload in a busy one stop or screening clinic can be relieved, with the removal of more mundane tasks allowing them more time for complicated or challenging scans or procedures. Guided diagnostic procedures such as FNA or core biopsy of larger lesions can be performed at a one-stop clinic by surgeons. For the surgeon, there is the joy of mastering an additional skill, and the satisfaction of being able to personally investigate and confirm a diagnosis. Now that surgical trainees in breast surgery are being trained to be competent to perform breast ultrasound, the debate lies not with whether surgeons should be performing USS, but at what stage and in which patients is it appropriate for the surgeon to utilise ultrasound, and at which stage the specialist advice of a breast radiologist should be sought.

References

1. Staren ED, Fine R. Breast ultrasound for surgeons. *Am Surg* 1996; **62**(2): 108–112.
2. Rozycki GS. Surgeon-performed ultrasound: its use in clinical practice. *Ann Surg* 1998; **228**(1): 16–28.
3. Rozycki GS, Ochsner MG, Schmidt JA, *et al*. A prospective study of surgeon-performed ultrasound as the primary modality for injured patient assessment. *J Trauma* 1995; **39**: 492–500.
4. Whitehouse PA, Baber Y, Brown G, *et al*. The use of ultrasound by breast surgeons in outpatients: an accurate extension of clinical diagnosis. *Eur J Surg Onc* 2001; **27**: 611–616.
5. Dixon JM. Breast infection. In: Dixon JM (Ed.). *ABC of Breast Disease.* 3rd edition. Oxford, UK: Blackwell Publishing Ltd; 2006: 19–20.
6. Varey AHR, Shere MH, Cawthorn SJ. Treatment of loculated lactational breast abscess with a vacuum biopsy system. *BJS* 2005; **92**(10): 1225–1226.
7. Damera A, Evans AJ, Cornford EJ, *et al*. Diagnosis of axillary nodal metastases by ultrasound-guided core biopsy in primary operable breast cancer. *Brit J. Cancer* 2003; **89**: 1310–1313.
8. Dixon JM, Renshaw L, Bellamy C, Stuart M, Hoctin-Boes G, Miller WR. The effects of neoadjuvant Anastrozole (Arimidex) on tumour volume in Postmenopausal women with breast cancer: a randomized, double-bind, single-center study. *Clin. Cancer Research* 2000; **6**: 2229–2235.

https://doi.org/10.1017/S1470903107003501 Published online by Cambridge University Press