

Controversy

Preoperative ultrasound-guided node biopsy and sentinel node augmented node sample is best practice

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1. Introduction

The axilla has long been a focal point of contention among breast surgeons. For perhaps the majority, nothing short of node clearance for all will suffice, regardless of likelihood of node positivity. This approach has always appeared tactless to some and now is challenged by many. Sentinel node biopsy (SNB) has catalysed the debate and renewed research in this field. Two factors primarily drive interest in SNB. The first is the fact that in countries with a breast-screening programme, rates of node positivity are now under 40%. Thus, many women undergo node clearance for no benefit. The second is the publication of several detailed subjective and objective assessments of morbidity following axillary clearance showing patient dissatisfaction at long-term treatment sequelae.

2. SNB—quality of evidence to date

Intuitively, SNB is an attractive concept and puts some science into a procedure that otherwise could be criticised for lacking it. The primary aim of SNB is well conceived—identifying patients for whom node clearance is warranted and useful and at the same time identifying those, for whom it is unnecessary. SNB has many enthusiasts. However, it is an indictment of surgical research that so many studies on one technique (SNB) can be published that individually and collectively provides no worthwhile evidence of benefit. The

only patients from whom any useful comment can be made in a comparison study of SNB with node clearance are those who are node-positive. Eagerness to publish has yielded many poor studies with high sensitivities for SNB, but no statistical power. When Confidence Intervals (CIs) for reported sensitivities are calculated, some conclusions are seen to be premature (Fig. 1, Table 1). Combine this with biases inherent in any study of a new technique performed by enthusiasts for it, the surgical community is left none the wiser in terms of the overall clinical utility of SNB. Assuming sensitivity for SNB of 95%, a comparison study with node clearance would require at least 230 patients to have CIs within 5%. Only three studies have published series this size and sensitivity varied from 88 to 95%. The vast array of variables in SNB technique from method used to identify the sentinel node (SN), timing and site of injection, use of scintigraphy, surgical experience, etc., condemns all such studies to be worthless in any combined meta-analysis. It is therefore not possible to say on the basis of current evidence that SNB is a safe alternative to standard practice or which patients derive most benefit.

3. SNB—limitations/unanswered questions

The SN is not identified in 2–5% of cases. There may be various explanations for this, but it limits the usefulness of the technique. It is also not (and unlikely to ever be) 100% sensitive—a point acknowledged by even its most ardent proponents. Hence, those who perform SNB will accept a (hopefully small) rate of regional recurrence. There are other limitations. Day-case SNB presents logistical problems particularly if scintigraphy

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is used. Is scintigraphy necessary? Blue dye injection can cause anaphylactic reaction [13] and tattooing of skin, which may still be present many months after surgery. Does blue-dye injection affect the ease with which wide local excision can be performed? There are economic issues and costs (again particularly if scintigraphy is used). What is the morbidity of SNB? When node clearance is performed within a short interval after SNB, scarring and fibrosis makes the procedure more challenging and structures (particularly intercostal nerves) can be more difficult to identify and preserve.

Radiotherapy to the axilla rather than node clearance after a positive SNB may be an attractive option for some. However, one positive node does not necessarily give adequate staging information and clearance is probably a better option for regional disease control in women with more than one or two nodes involved in a sampling procedure [14]. SNB that only excises one or two nodes does not provide information on the extent of nodal disease and many clearances performed on the basis of a positive sentinel node are node-negative (50%). One reason is that preoperative selection criteria tend to exclude women who are likely to have nodal disease or if they are node-positive are unlikely to have more than one or two nodes positive. Selection on the basis of clinical node status is unreliable. Approximately 30–40% of clinically node-positive women will, in fact, have negative nodes. They are deemed not suitable for

SNB and hence will undergo ANC unnecessarily. Many units, who perform SNB, also perform internal mammary (IM) node biopsy. This is a change in normal practice for most units and is performed selectively on identifying an IM SN on scintigraphy. Morbidity of this procedure requires detailed assessment. IM node involvement is uncommon although can provide useful prognostic information for few patients. Making a separate incision to excise an IM node would not appear to be justified. Less than 10% of all node-positive patients will have metastases only in the IM node [15]. It is also unlikely to influence the choice of adjuvant therapy in women who are axillary node-positive and is perhaps best suited to those women with a negative preoperative ultrasound of the axilla who have a medial cancer or are undergoing mastectomy.

4. Alternatives to SNB

The most attractive option for axillary node staging is preoperative determination of node status. In our unit, 46% of node-positive women are diagnosed preoperatively by ultrasound-guided node biopsy. This is similar to a previous published report [16]. Expert radiology support is required, but women proven as node-positive preoperatively can be selected for node clearance. Axillary node sampling is a good option for women who cannot be staged preoperatively. Four-node sampling has been subject to assessment by randomised trials and objective morbidity analysis [17]. It is employed by 38% of surgeons treating women with screen-detected breast cancer in the United Kingdom (UK). Like SNB, it requires training and the technique must be mastered before it is routinely employed. In trained hands it is not, as is sometimes thought, a random procedure. The SN occupies a relatively constant site (medial to the pedicle of the tail of the breast and just above or just below the second intercostal nerve). This is a specific hunting ground for node samplers. In a comparison study with SNB, node sampling was more sensitive and more clinically useful [18]. In other comparison studies with node clearance, node sampling has been found to be 96–97% sensitive at determining axillary node status (at least as good as SNB) [19–21]. Node sampling augmented by SNB may be the best of both worlds and blue-dye (sub-areola injection) augmented node sampling is, in this author's opinion, the most practical option and currently used in his routine practice. This, it could be argued, is effectively what is being assessed by one randomised trial of SNB [22]. The National Surgical Adjuvant Breast Project (NSABP) B32 trial effectively defines a sentinel node as any node that is hot, blue or neither hot nor blue, but feels abnormal. Pragmatism in managing the axilla is both sensible and appropriate.

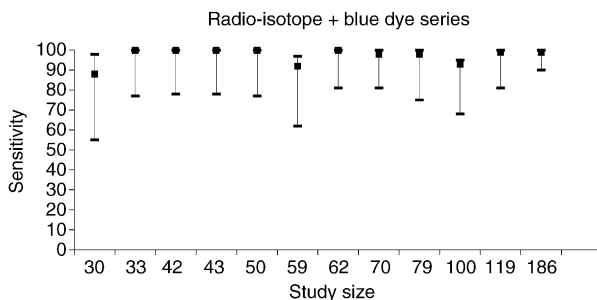


Fig. 1. Graph showing relative sensitivities of studies using both dye and radio-isotope.

Table 1
Reference numbers for the studies quoted in Fig. 1

| Ref. | Study size |
|------|------------|
| [1] | 30 |
| [2] | 33 |
| [3] | 42 |
| [4] | 43 |
| [5] | 50 |
| [6] | 59 |
| [7] | 62 |
| [8] | 70 |
| [9] | 79 |
| [10] | 100 |
| [11] | 119 |
| [12] | 186 |

We, like others, await the results of randomised trials of SNB with keen interest. These trials will further our knowledge of axillary metastases, further explore their significance, improve their treatment and, importantly, define more accurately the morbidity of different treatment options. However, the primary endpoint of these trials is regional nodal recurrence and survival. It will take several years before enough events have accrued for this to be reported. For many, the sentinel node may prove a more useful tool in research rather than clinical practice. In the meantime, preoperative ultrasound-guided node biopsy and SNB (blue-dye) augmented node sampling seem to be very attractive options for managing the axilla.

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