Patients’ view on intraoperative diagnosis of sentinel nodes in breast cancer: Is it an automatic choice?

Dennis W. Chicken, Naveethan Sivanadarajah, Mohammed R.S. Keshtgar*

Department of Surgery, University College London, 2nd Floor, Charles Bell House, 67-73 Riding House Street, London W1W 7EJ, United Kingdom

KEYWORDS
Breast cancer; Sentinel node; Intraoperative diagnosis; Frozen section; Touch imprint cytology; Patient choice; Psychological effect

Abstract  Intraoperative detection of sentinel node metastases in breast cancer enables immediate axillary lymph node dissection. This approach, however, introduces uncertainty for patients as to the extent of surgery. Waking to find a surgical drain implies more extensive surgery and worse prognosis disease. False negative diagnoses may cause disappointment.

Aim: To evaluate patients’ views and preferences on intraoperative diagnosis of sentinel nodes in breast cancer.

Methods: Questionnaire based survey of 100 patients who had previously undergone sentinel node biopsy with intraoperative diagnosis using touch imprint cytology (TIC). Patients were encouraged to add free text comments.

Results: Sixty-four patients responded to the questionnaire. Patients rated the information provided and their understanding of the procedure highly. Fifty-nine percent of respondents overestimated the sensitivity of TIC. Ninety-five percent of patients would choose to undergo intraoperative diagnosis in future if required. Five percent of patients would choose not to undergo intraoperative diagnosis, citing the resultant uncertainty, disappointment on waking and needing time to come in terms with the diagnosis of metastases as reasons.

Conclusion: Given the choice, most patients would choose intraoperative diagnosis, though a minority would explicitly not, due to the adverse psychological effect thereof. Despite a good understanding of the procedure, the majority of patients overestimate the sensitivity of intraoperative diagnosis of sentinel nodes, which
may heighten disappointment when a false negative diagnosis occurs. Intraoperative diagnosis should not be the automatic choice and patients should be actively involved in this decision making process.

© 2006 Surgical Associates Ltd. Published by Elsevier Ltd. All rights reserved.

Introduction

Sentinel node biopsy has emerged as a standard of care for nodal staging of breast cancer. Intraoperative diagnosis of sentinel nodes enables an immediate decision to proceed to completion axillary lymph node dissection (ALND), where indicated. From the patients’ perspective, intraoperative diagnosis introduces an uncertainty over the operative procedure, since on induction of anaesthesia, the extent of surgery they are to undergo is not known. Waking with a surgical drain implies both a more extensive surgical procedure (ALND) and worse prognosis (node-positive) disease. Furthermore, even the most intensive intraoperative examination has a false negative rate, which results in a proportion of patients still requiring delayed completion ALND. For these patients, initial post-operative elation is replaced by disappointment.

While many clinicians believe that intraoperative diagnosis is advantageous, little is known about patients’ views and preferences.

Aim

To evaluate patients’ views and preferences of intraoperative diagnosis of sentinel lymph nodes in breast cancer.

Methods

After obtaining ethical approval, we conducted a questionnaire based survey of 100 consecutive patients who underwent sentinel node biopsy for breast carcinoma within the preceding 18 months. All patients had undergone intraoperative diagnosis of sentinel nodes utilizing touch imprint cytology (TIC). The sensitivity of TIC in our institution is 81% with 100% specificity. This information was provided both verbally and on an information sheet with particular emphasis on the false negative rate. All patients with a positive (metastatic) TIC underwent immediate axillary lymph node dissection. Patients with a negative (normal) TIC who were subsequently found to have metastases on haematoxylin and eosin stained sections, were offered completion ALND as a second operative procedure.

The questionnaire comprised 10 questions and patients were encouraged to add free text comments to all sections of the questionnaire. Five questions evaluated patients’ understanding of the extent of the operative procedure performed. Patients’ perception of the sensitivity of the intraoperative diagnostic test was evaluated with a multiple choice question. Patients were asked to rate the information provided pre-operatively and their understanding of the surgery performed on a scale of 0–10 (0 = poor, 10 = excellent). Finally patients were asked to score their preference for intraoperative diagnosis aiming for a one stage operation or standard histological diagnosis resulting in a two stage procedure if required. They were asked to indicate their preference on a scale of 0–10 (0 = strongly disagree, 10 = strongly agree).

Results

We received 64 responses. Of these, 32 patients had true negative, 29 true positive and 3 false negative diagnoses on touch imprint cytology (Table 1). A higher proportion of patients with true positive diagnoses than true negative or false negative diagnoses responded to the questionnaire ($\chi^2 = 7.17, p = 0.03$).

There was good correlation (62/64 = 97%) between patients’ understanding and the actual procedure performed. Patients’ score of the quantity and quality of information provided was high

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Summary of the accuracy of intraoperative diagnosis for responders and non-responders to questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Response</td>
</tr>
<tr>
<td>True positive</td>
<td>29</td>
</tr>
<tr>
<td>True negative</td>
<td>32</td>
</tr>
<tr>
<td>False negative</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
</tr>
</tbody>
</table>

There is a significant difference between responders and non-responders. $\chi^2 = 7.17, p = 0.03$. 

...
(mean = 9.3/10, standard deviation = 1.0). Similarly patients’ rating of their understanding of the surgical procedure performed was high (mean = 9.3/10, standard deviation = 1.1).

The majority of respondents (29/49 = 59%) overestimated the sensitivity of intraoperative diagnosis (see Table 2). Thirty-nine percent (19/49) of patients correctly estimated and 1 patient underestimated the sensitivity of touch imprint cytology. Eight patients could not recall the sensitivity and 7 patients did not answer the question.

Fig. 1 shows the range of scores for patients’ choice of sentinel node biopsy with or without intraoperative diagnosis. We classified a score of above 5 as agreement, below 5 as disagreement and a score of 5 as indecision. Based on this, 95% of respondents (57/60) would choose intraoperative diagnosis if they had to undergo sentinel node biopsy in the future. Five percent (3/60) would prefer not to undergo intraoperative diagnosis (Table 3). Of these patients, 2 had true negative diagnoses and 1 had a false negative diagnosis.

When asked to express their opinion on sentinel node biopsy without intraoperative diagnosis, 22% (12/54) of patients would agree to undergo a two stage procedure, 74% (40/54) would disagree and 4% patients (2/54) were undecided. Ten respondents did not answer this question. Some patients indicated a high level of agreement with both options, indicating by free text comments that they would be prepared to be advised by their medical team.

Selected extracts from free text comments in favour and against intraoperative diagnosis are listed in Table 4.

**Discussion**

Sentinel node biopsy is now well established as an accurate technique for axillary staging in breast cancer with proven lower morbidity when compared to conventional ALND. Intraoperative diagnosis of sentinel nodes using either frozen section or touch imprint cytology is a logical approach. It potentially avoids a second operative procedure for ALND and facilitates earlier commencement of adjuvant therapy for those patients likely to benefit most.

While the rationale for intraoperative diagnosis of sentinel nodes appears attractive, no previous studies have evaluated patients' views on this issue. The patients’ comments listed in Table 4 give an interesting perspective. Intraoperative diagnosis introduces uncertainty for the patient at induction of anaesthesia as to the extent of surgery to be performed. Since sentinel node biopsy does not usually require surgical drainage, waking to find a surgical drain implies both a more extensive surgical procedure as well as worse prognosis node-positive disease. The presence of a drain is, in effect, breaking this bad news to the patient. The psychological impact of this has not been determined and this area remains a subject of our research interest. It is interesting to note that 2 of the 3 patients who would choose against future intraoperative diagnosis had true negative results. We acknowledge that a higher proportion of patients with true positive than true negative or false negative intraoperative diagnoses responded to this questionnaire, which may introduce some bias to the results.

False negative intraoperative diagnosis is a reason for further concern. This results in some patients’ initial post-operative elation being replaced with disappointment when final histology is available. Even the exhaustive intraoperative frozen section methodology described by the European Institute of Oncology has an imperfect negative predictive value of 95.4%. The sensitivity of routine frozen section and touch imprint cytology is significantly lower. An unexpected false negative diagnosis may exaggerate the adverse psychological effect. It is noteworthy that the majority of respondents within this study overestimated the sensitivity of intraoperative diagnosis. This is despite the high rating of adequacy of pre-operative information and understanding of surgery. This emphasizes the need to ensure that patients understand the potential for a false negative result and have realistic expectations of what can be achieved at their treating hospital. False positive diagnoses have been reported for both frozen section and touch imprint cytology, which could lead to unnecessary extensive surgery (ALND). There were no false positive diagnoses in this study.

<table>
<thead>
<tr>
<th>Estimated sensitivity</th>
<th>Number of patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;95%</td>
<td>29</td>
<td>59</td>
</tr>
<tr>
<td>&gt;80%</td>
<td>19</td>
<td>39</td>
</tr>
<tr>
<td>&gt;40%</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>&lt;20%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Don’t know</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Not answered</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>100</td>
</tr>
</tbody>
</table>
Early results from the UK ALMANAC study have shown heightened pre-operative anxiety in patients undergoing sentinel node biopsy (though not significantly different from patients undergoing ALND), which returns to baseline post-operatively. This anxiety may be accentuated by utilizing intraoperative diagnosis, and should be prospectively studied. Fallowfield et al. have shown that patient anxiety is influenced by both information provision and choice, which highlights the need for both thorough pre-operative counselling and for patients to be actively involved in decision making.

Given the choice, the majority of patients would prefer intraoperative diagnosis when undergoing sentinel node biopsy for breast cancer. Five percent of patients who responded to the questionnaire in this study would, however, explicitly choose not to undergo intraoperative examination, emphasizing the need to plan management on an individual basis. It is interesting to note that some patients indicated high levels of agreement for sentinel node biopsy both with and without intraoperative diagnosis, with comments indicating their desire to leave this choice up to their operating surgeon.

**Conclusion**

This study demonstrates that patients overestimate the sensitivity of intraoperative diagnosis, which may accentuate the disappointment when a false negative diagnosis occurs. The majority of patients would choose intraoperative diagnosis though some
identify the disadvantages thereof, and would explicitly decide against it. Intraoperative diagnosis should therefore not be the automatic choice.

References


Table 4 Patients’ opinions about intraoperative diagnosis: selected free text comments in favour (above) and against (below) intraoperative diagnosis of sentinel nodes

Patients’ opinions in support of intraoperative diagnosis

“Why waste time?” (TP)
“Prefer it all done at once — like me — One less anaesthetic” (TP)
“I feel a 2 stage operation delays the start of treatment” (TP)
“It made sense to me” (TN)
“My understanding is, if it has to be removed, why delay!” (TP)
“Seems a sensible option. Preferred a single operation” (TP)
“Get it over with” (TN)
“Having two (possible) operations rather than one would seem to add stress and I imagine delay next phase of treatment” (TN)
“I feel no intraoperative diagnosis delays the start of treatment and may cause a financial burden if you are away from your job for too long if radiotherapy and chemotherapy are required” (TP)
“When I woke up with a big scar under my arm I was very sad. I’m glad it was all done at the same time — but the sentinel node biopsy gave me hope which was dashed when I woke up.” (TP)

Patients’ opinions opposed to intraoperative diagnosis

“I would rather have time between the 2 op’s to think and talk about the after effects of this. For me this is important, as I had to come to terms with the second diagnosis of the spread” (FN)
“The uncertainty was quite distressing” (TP)
“I was very disappointed when I woke to find a drain and should have been better prepared psychologically for this outcome” (TP)

The class of imprint cytology result corresponding with each statement is given in parentheses (TP = true positive, TN = true negative, FN = false negative).