Introduction

Axillary nodal status is one of the most important prognostic indicators of disease outcome in women with early breast cancer. Patients with histologically involved lymph nodes can anticipate a survival of only about 50%. For many years, axillary nodal clearance (ANC) has been a part of the conventional management of early-stage breast cancer as it is associated with a low recurrence rate and a low false-negative rate. However,
with the introduction of sentinel node biopsy (SNB) into clinical practice in the mid 1990s, the optimal management of the axilla in breast cancer patients has become an issue.

Recent studies have shown that sentinel node biopsy can provide an accurate assessment of the axillary nodal status, without removing most of the axillary contents\(^6\), in patients with clinically node-negative breast cancer. The accuracy of SNB has also been very well documented, with recent large series reporting false-negative rates in the range of 2–5\(^%\).\(^6\)-\(^10\). This means there is a possibility that up to 5\(^%\) of patients undergoing SNB may be deprived of adjuvant cytotoxic chemotherapy which is known to improve survival in patients with node-positive breast cancer.

However with the SNB, patients with axillary nodes who are negative for malignancy can be spared from ANC, which is associated with 10\(^%\) clinically significant arm morbidity. This includes short-term sequelae, such as wound infection, seroma and limited arm movement, as well as more disabling long-term complications such as lymphoedema, arm numbness and chronic pain\(^8\),\(^11\).

In most centres, SNB has not been introduced as a routine procedure. However, since initial reports that the technique often allows avoidance of axillary dissection and its associated complications, increasing numbers of breast cancer patients are specifically requesting SNB and to avoid ANC if the sentinel node is negative.

A utility analysis based on established literature suggests that patients with \(T_1\) breast cancer may have a 1 in 1000 risk of reduced survival if they opt for the SNB but avoid the 10\(^%\) risk of arm morbidity if found to be node-negative. However, prospective observational studies have shown no increased incidence of axillary recurrence and confirmed the negligible morbidity associated with the SNB technique\(^9\),\(^10\).

The aim of this study is to determine the proportion of female patients attending the breast unit who would choose the SNB in preference to ANC.

**Methods**

A detailed questionnaire (Figure 1) based on a utility analysis of established medical literature as described by Gan et al.\(^13\) and containing clear and precise information on arm morbidity associated with ANC (1 in 10) versus a potential reduction in the 5-year-survival rate with SNB (1 in 1000) was distributed to 200 female patients attending the Princess Grace Hospital Breast Unit in London (UK) during January 2003. The study population included patients attending the unit for consultation, follow-up or breast screening. The questionnaire consisted of two possible treatment scenarios (ANC or SNB) for early-stage breast cancer with its associated risks and benefits, and respondents were asked to choose one of the two options. Data on the respondent’s age, presence of family history and/or personal history of breast cancer were also recorded.

**Results**

A total of 200 (100\(^%\)) completed questionnaires were received. Out of the 200 women, 99 (49.5\(^%\)) chose the SNB option (option 2) and 101 (50.5\(^%\)) chose the ANC option. The median age of the participants in this study was 52 years (range 21–83 years). The age distribution of those who chose each option is presented in Table 1. No significant relationship was found between age and the option chosen by the respondents (mean age 53.4 vs 54 years). Tables 2 and 3 show the distribution between family history of breast cancer and personal history of breast cancer with the options chosen, respectively. We observed no significant relationship between family history and personal history of breast cancer with the options chosen (\(p = 0.118\) and \(p = 0.85\), respectively). Furthermore, there was no significant association between employment status and women’s choice (\(p = 0.96\)).

**Discussion**

The term sentinel node was first introduced by Cabanas in 1977 in a series of patients with carcinoma of the penis\(^14\). However, the validity of the concept was only first demonstrated in 1992 by Morton et al.\(^15\) in patients with melanoma. In this group of patients, sentinel nodes were identified intra-operatively, with a false-negative rate in patients with an identified sentinel node of only 1\(^%\).

The usage of SNB in breast cancer was first described by Krag et al.\(^16\) in 1993, where the sentinel node was identified in 18 out of 22 patients. The sentinel lymph node is defined as the first node in the lymphatic basin that receives the primary lymphatic flow. In the case of breast carcinoma, the sentinel nodes are usually found cranial to the intercostobrachial nerve, within 2 cm of the lateral edge of the pectoralis minor muscle\(^17\). A negative sentinel node virtually excludes lymphatic involvement of the entire regional lymphatic basin\(^18\).

Since 1993, many studies have been conducted to evaluate the accuracy and reliability of SNB as a possible treatment for patients with breast cancer. There are a number of ways of identifying the sentinel node but the
AN INVITATION TO EXPRESS YOUR OPINION ON A NEW BREAST CANCER TREATMENT

You are invited to express your opinion on a new treatment (sentinel node biopsy) for breast cancer. Please read the scenario outlined below and choose between the two options. This will be very helpful as we continue to improve the treatment of this disease, which affects so many British women. I would like to thank you in advance for your assistance.

Scenario

Imagine that a woman has just found out that she has early breast cancer. She has a very good chance of being cured, if she has adequate treatment. This will involve an operation and if the cancer has spread to the axillary lymph nodes, she may also require chemotherapy. To find out whether the cancer has spread, the woman may be given two options. If you were the woman, which one would you choose?

Option 1:

As part of her operation, all of the lymph nodes in the armpit are removed and tested (axillary node clearance). If cancer has spread to any of them, chemotherapy would be recommended to increase her chance of cure. After removing the lymph nodes, up to 10% of women will have some shoulder stiffness, progressive arm swelling (lymphoedema) or an increased risk of infection of the arm in the future.

If you choose this option, 92.7% of women will be alive in 5 years.

Option 2:

As part of her operation, only the first lymph node known as the sentinel lymph node is removed from the armpit for testing. This node can be identified during the operation by using a blue dye (and/or radioactive isotope). If cancer has spread to this node, chemotherapy would be recommended to increase her chance of cure. The benefit of this option would be that shoulder stiffness or arm swelling would be avoided. However, in 5% of cases, the wrong lymph node may be removed so that the spread of cancer is not detected and chemotherapy may not be recommended when it should be.

If you choose this option, 92.6% of women will be alive in 5 years.

In summary, if you choose to have the sentinel lymph node option, there would be a 0.1% (1 in 1000) reduction in the chance of cure, but you would avoid a 10% (1 in 10) risk of side effects from axillary node clearance.

PLEASE TICK THE OPTION YOU WOULD CHOOSE IF YOU WERE THIS WOMAN (TICK ONE ONLY)

OPTION 1    

OPTION 2    

About yourself: Your age: _______ Your occupation: __________________________________________

Do you have a family history of breast cancer? Please circle appropriately. Yes  No

Do you have a personal history of breast cancer? Yes  No
most promising results were obtained when the dual SNB technique of blue dye and radiocolloid were used. Recent studies have demonstrated that by using the combination technique, the sentinel lymph node can be successfully identified in more than 90% of cases, with a false-negative rate of 5% and an overall accuracy rate of 97.5%. This high level of accuracy in predicting the axillary nodal status in patients with node-negative early breast cancer, even with the wide variation of techniques used and the lack of data from randomised controlled trials for SNB, have led to its widespread use. Even though a low false-negative rate is inherent with SNB, its importance has been offset by studies which concluded that the risk of developing axillary nodal failure is in fact a rare occurrence in patients with early-stage breast cancer. In addition, other data from prospective observational studies have shown no increase in incidence of regional recurrence and also confirm the low morbidity rate of SNB. Indeed, patients who underwent SNB had less postoperative arm morbidity compared to those undergoing a level I or level II ANC. They also had fewer wound complications and had a shorter hospital stay. It can also be argued that, despite the false-negative rate, SNB may in fact be more beneficial to the majority of patients, as a focused evaluation of the nodes most likely to harbour metastatic disease should maximise the pathologist’s ability to identify micrometastatic disease which otherwise may be missed by routine pathological examinations. This ability to better stage breast cancer patients should have a profound effect on adjuvant therapy decisions, as patients previously classified as node negative who are found to harbour micrometastatic lymph node disease are very likely to benefit from adjuvant systemic therapies.

The growing demand from patients for less invasive procedures has contributed to the considerably widespread acceptance of the usage of SNB without ANC as a standard practice of care for clinically node-negative early breast cancer. This study has demonstrated that up to 50% of the women surveyed are in favour of SNB, even if it is associated with a small risk of reduced survival, compared to ANC which is associated with significant arm morbidity. This implies that women attach greater significance to arm morbidity than to potential reduction in survival and seem to have a high level of confidence in the credibility of this treatment for early breast cancer, even though long-term data from randomised controlled trials are still awaited.

Choosing between SNB and ANC is not an easy task and while some women may prefer not to risk having a reduced survival rate by going for SNB, others may feel that the small risk taken is justified by the better quality of life retained by not opting for ANC. An informed decision should be made in consultation with their oncologist and other healthcare professionals.

<table>
<thead>
<tr>
<th>Age range</th>
<th>Option 1 (ANC)</th>
<th>Option 2 (SNB)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 31</td>
<td>2 (2.0%)</td>
<td>1 (1.0%)</td>
<td>3 (1.5%)</td>
</tr>
<tr>
<td>31–40</td>
<td>8 (7.9%)</td>
<td>10 (10.1%)</td>
<td>18 (9.0%)</td>
</tr>
<tr>
<td>41–50</td>
<td>37 (36.6%)</td>
<td>29 (29.3%)</td>
<td>66 (33.0%)</td>
</tr>
<tr>
<td>51–60</td>
<td>31 (30.7%)</td>
<td>39 (39.4%)</td>
<td>70 (35.0%)</td>
</tr>
<tr>
<td>61–70</td>
<td>20 (19.8%)</td>
<td>17 (17.2%)</td>
<td>37 (18.5%)</td>
</tr>
<tr>
<td>&gt; 70</td>
<td>3 (3.0%)</td>
<td>3 (3.0%)</td>
<td>6 (3.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>101 (100.0%)</td>
<td>99 (100.0%)</td>
<td>200 (100.0%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive family history</th>
<th>Option 1 (ANC)</th>
<th>Option 2 (SNB)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 (29.7%)</td>
<td>19 (19.2%)</td>
<td>49 (24.5%)</td>
</tr>
<tr>
<td>Negative family history</td>
<td>71 (70.3%)</td>
<td>80 (80.8%)</td>
<td>151 (75.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>101 (100.0%)</td>
<td>99 (100.0%)</td>
<td>200 (100.0%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Positive personal history</th>
<th>Option 1 (ANC)</th>
<th>Option 2 (SNB)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11 (10.9%)</td>
<td>9 (9.1%)</td>
<td>20 (10.0%)</td>
</tr>
<tr>
<td>Negative personal history</td>
<td>90 (89.1%)</td>
<td>90 (90.0%)</td>
<td>180 (90.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>101 (100.0%)</td>
<td>99 (100.0%)</td>
<td>200 (100.0%)</td>
</tr>
</tbody>
</table>
choice requires that detailed information be given regarding the relative morbidity and mortality of each option, knowledge of the surgeon’s experience in using the SNB technique and a statement that conclusive data from ongoing trials are not yet available. This study shows that the decision to undergo SNB (or ANC) remains a highly personal and individualised one among British women and is not affected by factors such as age, employment status family history of breast cancer or personal history of breast cancer. However, one should not overlook the doctor’s influence on the decision-making process, as well as other factors involved in the process of making this difficult decision. The present study was limited by the fact that the decisions made were based on hypothetical simplified scenarios, thus the results obtained may be different from a similar study conducted in a real-life setting.

In summary, this study demonstrates that a high level of acceptance exists among women, for SNB as an alternative to ANC for treatment of early breast cancer, despite the risk involved. As this exciting technique continues to evolve and improve, it is hoped that more women will be given the choice to opt for this treatment and that eventually SNB may completely replace ANC as the standard treatment for women with early breast cancer.

References


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