Wide local excision and sentinel lymph node biopsy for early stage breast cancer – feasibility of day-case surgery

RACHEL CLANCY, DAVID BUNTING & ROGER WATKINS

Keywords: Breast cancer, intermediate surgery, ambulatory care pathway.

Abstract

Introduction: In breast cancer patients there remains considerable variation in practice with regard to the length of hospital stay following intermediate breast and axillary surgery. A prospective study has been undertaken to assess the safety and feasibility of a new ambulatory care pathway for these procedures.

Patients and Methods: Over a 4 year period 159 patients undergoing wide local excision (WLE) and sentinel lymph node biopsy (SLNB) for early breast cancer were selected to be treated by a new day-care pathway.

Results: Overall 123 (77%) patients completed the day care pathway as intended and none required emergency re-admission following successful discharge home. The rate of complications was as expected and no serious untoward incidents related to the new pathway were reported.

Conclusions: With close attention to all elements of the patient pathway, high rates of successful day case combined breast and axillary surgery are both feasible and safe.

Introduction

Advantages of day care surgery

Compared with a conventional in-patient stay, day-case surgery has several potential benefits.

Day care patients avoid the need for a post operative hospital bed and the nursing care that accompanies an overnight admission. Consequently expenditure for each surgical episode is significantly reduced. Indeed, the shift of cancer treatment services from in-patient to ambulatory care was one of the key actions in the Cancer Reform Strategy published in 2007. In addition, patient satisfaction with day-surgery for breast cancer has been shown to be high.

Current guidelines

In 2007 the British Association of Day Surgery (BADS) published guidelines indicating that certain types of intermediate breast and axillary surgery should be performed as day-case procedures. These included excision or biopsy of breast tissue with or without localisation and sentinel lymph node mapping and biopsy (SLNB). The guidelines recommend that wide local excision (WLE) of breast lesions should be performed as a 23-hour stay procedure rather than a day-case procedure. Similar guidelines were also published in 2009. In the current guidelines the recommendations are that whereas 80% of cases undergoing SLNB can be treated as a day-case it is expected that only 15% of cases undergoing WLE would qualify for a day case pathway. In practice sentinel node biopsy is usually performed at the same time as WLE and the two procedures should therefore be considered together rather than as separate entities.

Aims

The aim of the current study was to assess the feasibility, efficiency and safety of performing WLE and SLNB for T1 and T2 breast tumours that were N0 on clinical examination, as a combined procedure using a day care pathway rather than with a traditional post-operative overnight stay.

Patients and Methods

A prospective study to evaluate a new day-case pathway was performed between June 2007 and March 2011. Patients included in the study underwent wide local excision (WLE) of either a palpable or impalpable breast cancer (T1 or T2) along with sentinel lymph node biopsy.
(SLNB) under general anaesthesia. Impalpable lesions were localised pre-operatively using either a hook-wire or ultrasound guidance, and satisfactory excision confirmed by intra-operative specimen radiography. All patients had no clinical evidence of axillary metastases and in the second half of the study period the majority had also undergone axillary ultrasound assessment. Sentinel node localisations were performed using radioactive technetium labelled nano-colloid injected pre-operatively and imaged by lympho-scanigraphy, followed by injection of Patent Blue V dye once general anaesthesia had been induced. In each case the surgical episode was planned as day case procedure with the full agreement of the patient and their carers.

Patients were informed about the proposed day care pathway when initially seen in the Breast Clinic with the results of their triple assessment. Patients were selected as being suitable based on their general health status, distance required to travel home and availability of a suitable carer in the post-operative period. In each case the patient was warned that an overnight stay might be required in some circumstances, especially if recovery from anaesthesia was delayed. Those patients deemed unsuitable for day case surgery or specifically requesting overnight post-operative stay were excluded from the study.

Steps were taken in each case to ensure that the majority of patients where surgery was planned as a day case procedure were successfully treated as such, unplanned admissions being avoided if at all possible. The day case pathway for WLE and SLNB consisted of the following important features.

i) Patient education and information
Prior to surgery patients were assessed in a pre-operative clinic where they had the opportunity to liaise with their Breast Care Nurse Specialist (BCNS). At this time patients were given both written and verbal information regarding day surgery. They were given the opportunity to ask questions and to express any concerns regarding their treatment pathway.

ii) GP Notification
Once the decision to adopt the new day case pathway was made for each patient their GP was notified of the arrangements by a standard letter.

iii) Special preoperative investigations
   a) Localisation of impalpable breast cancers
Radiological and ultrasound localisation were performed on the day of surgery in most patients but if this was not feasible localisation was performed on the preceding day, usually in the late afternoon. Standard fixation of hook wires was used to prevent their displacement and surface localisation marks with permanent skin markers were covered with a waterproof dressing.
   b) Sentinel lymph node localisations
For patients undergoing surgery during a morning list, injection of radio-isotope and lymphoscintigraphy were performed during the afternoon of the preceding day. For those undergoing surgery in the afternoon isotope injections were performed on the day of surgery. The dose of isotope was varied according to the delay between injection and surgery, larger doses being used if injection was performed on the preceding day.

Those patients requiring localisation and/or radioactive isotope injection on the day prior to surgery returned home after the procedure and attended the following day for their day surgery.

iv) Peri-operative care
   a) Admission
Patients were admitted to either a dedicated day surgery unit or to the pre-operative admission lounge of the main theatre complex depending on which theatre was being used. Following routine pre-operative checks, patients were encouraged to walk to the anaesthetic room. Premedication other than simple oral analgesics was not used.
   b) Anaesthesia and surgery
Operations were all performed under general anaesthesia, in most cases using total intravenous anaesthesia. SLNB was performed prior to excision of the breast cancer but intra-operative analysis of the sentinel lymph node was not performed and no patients underwent axillary lymph node clearance at the time of their initial surgery.

Where specimen radiography was required to confirm successful excision of an impalpable breast lesion a mobile digital X-ray system was used in theatre. In many cases wide local excision was followed by reconstruction of the breast shape using a variety of tissue displacement techniques. Particular attention was given to obtaining meticulous haemostasis. Small bore suction drains were used to prevent post-operative fluid collection. 0.25% levobupivacaine was routinely injected into all surgical wounds at the end of each operative procedure.

v) Post-operative recovery
   a) Early mobilization
Early mobilisation was encouraged to provide protection against deep vein thrombosis and enable patients to return home as soon as possible. Transfer of the patient from trolley to chair was performed as soon as was feasible in each case.
   b) Oral intake
Patients were encouraged to eat and drink early after their operation, removing their intravenous access once adequate oral intake had been established.
   c) Drains
Where used, suction drains were removed by the recovery ward staff immediately prior to discharge according to written instructions from the surgeon.
**d) Management of pain, nausea and vomiting**

All patients had intravenous paracetamol during their procedures. If possible patients were not given opioid analgesia. Necessary medication was given to provide relief from side effects such as nausea and vomiting.

**vi) Discharge**

Patients were considered fit for discharge if there were no obvious immediate complications, if their pain was well controlled and they were able to mobilize adequately. In addition they had shown they could tolerate oral fluids satisfactorily and that they felt safe and ready to be discharged from hospital.

Nurse-led discharge was in accordance with instructions given by the surgeon in each case. Patient information given on discharge included the first scheduled outpatient appointment at which the surgical site would be reviewed and the histopathology results discussed. In addition patients were given information needed for any emergency that might arise and a standard discharge letter for their GP.

**vii) Post-operative care**

On the morning of the first post-operative day the patients' BCNS telephoned each patient to ensure that there were no significant problems. Review by the BCNS or referral to the GP or consultant surgeon could be arranged at this stage if deemed necessary. In addition in the second half of the study period a twice-weekly open access clinic led by one of the BCNSs was established and patients were encouraged to attend if they had any non-urgent problems.

**Results**

159 patients were studied over a 4 year period. Their mean age was 58 (range 27-78) years. 70 (44%) patients required pre-operative ultrasound localisation whereas 32 (20%) had radiological localisation using a hook wire. The remaining 56 (35%) patients had easily palpable tumours and did not require pre-operative localisation.

Two patients had type II diabetes, several had stable ischaemic heart disease and one had severe multiple sclerosis.

Overall 123 [77%! completed the day-case pathway as intended with the remainder requiring an unplanned overnight stay. Of the 36 (23%) patients requiring overnight admission all but one was successfully discharged home the following morning.

No patients required unplanned admission to hospital following successful discharge home on the day of surgery.

The most common reasons for an unplanned overnight stay immediately following surgery were delayed recovery from anaesthesia and post-operative nausea and vomiting. Anaphylaxis secondary to Patent Blue V dye was noted as a cause in one patient and development of a breast haematoma necessitated overnight stay in another case. A detailed list of the reasons for unplanned overnight stay is shown in Table 1.

**Table 1 List of causes which necessitated unplanned overnight stay.**

<table>
<thead>
<tr>
<th>Delayed recovery from anaesthesia</th>
<th>Delay in starting and/or finishing surgical procedure</th>
<th>Post-operative nausea and vomiting</th>
<th>Post-operative bleeding/haematoma formation</th>
<th>Patient request due to transport or social difficulties</th>
<th>Exacerbation of co-morbid conditions</th>
<th>Anaphylactic reaction to Patent Blue V dye</th>
<th>Vasovagal attack</th>
</tr>
</thead>
</table>

59 patients underwent surgery during a morning session of which 8 [14%] required an overnight stay. In contrast, of 100 patients having surgery in the afternoon 27 [27%] remained in hospital overnight. It appeared that patients operated during the morning session were less likely to require an overnight stay but the difference did not reach statistical significance.

Although the numbers of patients per year recruited into the study remained relatively constant during the study period the success rate for completion of the day-case pathway with no need for an overnight stay improved from 35% in 2007 to 100% 2011 (Figure 1). This trend, analysed by individual years, towards improving performance with time does not reach statistical significance but analysis of the 99 cases performed in 2009-11 compared with the 60 undertaken in 2007-08 does show a significant reduction in the number of patients requiring an unplanned overnight stay from 38% in the first part of the study period to 13% in the latter years (Chi-square with Yates correction=12.15, P<0.001).

**Figure 1** Cases treated using the day case pathway in each year with number requiring an unplanned overnight stay.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of cases per year (N)</th>
<th>Discharge on day of surgery N(%)</th>
<th>Overnight stay required N(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>14</td>
<td>14 [100]</td>
<td>0 [0]</td>
</tr>
<tr>
<td>2010</td>
<td>41</td>
<td>35 [85]</td>
<td>6 [15]</td>
</tr>
<tr>
<td>2009</td>
<td>44</td>
<td>37 [84]</td>
<td>7 [16]</td>
</tr>
<tr>
<td>2008</td>
<td>43</td>
<td>31 [72]</td>
<td>12 [28]</td>
</tr>
<tr>
<td>2007</td>
<td>17</td>
<td>6 [35]</td>
<td>11 [65]</td>
</tr>
<tr>
<td>TOTAL</td>
<td>159</td>
<td>123 [77]</td>
<td>36 [23%]</td>
</tr>
</tbody>
</table>

Three patients developed a significant haematoma at the site of their breast surgical procedure. One patient was admitted overnight following her surgery and the haematoma evacuated the following day. The two other patients had already been discharged home but neither required readmission, their haematomas being managed conservatively.


**Discussion**

According to recent Hospital Episode Statistics (HES) data the mean length of stay for breast cancer surgery has reduced considerably over the last 10 years. In 2000, the length of stay for mastectomy was 6.5 days falling to just under 4 days by 2011. Similarly for wide local excision the figures show a fall from 3.5 days to just over one day in the same time frame. These overall figures disguise enormous variation with some hospitals currently reporting a mean length of stay for WLE of over 2 days whilst others achieve successful day case rates in excess of 50%.

Introduction of a shorter length of stay after breast cancer surgery in the Netherlands was successfully accomplished by actively encouraging centres to take part in the programme. As a result the number of patients being treated by a short stay programme almost doubled. No increase in the rates of complications, readmissions or reoperations was observed and hopefully such evidence will encourage other centres to adopt similar programmes.

In the current series a careful audit of complications was undertaken. Again no increase in complications was noted and no serious untoward incidents that could be attributed to the day pathway were reported. Overall almost three-quarters of all patients successfully completed the planned day case pathway and none of these required emergency readmission as a result of complications. This finding is similar to that of an earlier series reported in 2005.

In order to stream-line the pre-operative pathway some patients required their localisation and/or lymphoscintigraphy to be performed on the day prior to surgery. This occurred mainly in those patients having their surgery first on a morning theatre list. Such timing of surgery appeared to be associated with the best chance of successfully completing the day case pathway but further cases in the series are required to establish statistical significance. Although surgical procedures performed in the morning often necessitated an additional hospital visit this pathway proved acceptable to patients and no episodes of wire dislodgement leading to failed localisation were reported.

Although 23% of patients required an overnight stay, there were significant improvements during the course of the study. In its last three months 100% success was achieved. Prior to this period the rates of over 85% are similar to other initial studies. It was encouraging to see the success rate improve during the study as staff became more familiar and confident with the pathway. Satisfactory feedback from patients was probably also a contributory factor in the improved figures as the programme evolved.

Delayed recovery from anaesthesia was the commonest reason for unplanned overnight stay in this study. A late start or delays in completing a surgical procedure were contributing factors in several cases, a problem noted in previous reports. Use of a mobile X-ray facility in the operating theatre allows rapid surgical specimen radiography to confirm satisfactory excision and avoids delays associated with transportation of specimens. In this way the surgical procedure time is minimised which is particularly important now that SLNB is usually performed prior to WLE. Any unnecessary prolongation of anaesthetic time is likely to increase the possibility of an unplanned overnight stay. Mobile specimen radiography machines can now be connected to the PACS system allowing the radiologist performing the localisation to also confirm accurate excision of the target lesion in a timely fashion.

The judicious use of pre-emptive analgesia allows patients to return home the same day as their surgery. The choice of analgesia is important as side effects such as drowsiness, nausea and vomiting may delay discharge. In the current study systemic analgesics were given in addition to local anaesthetic infiltration of the surgical wounds using 0.25% levobupivacaine which was standard in all cases.

Thoracic para-vertebral blockade has also been used for ambulatory breast cancer operations in an attempt to reduce the need for systemic analgesics, thus further avoiding the side effects of narcotic drugs. The technique has proven very effective and popular with patients improving their post-operative pain control and reducing the likelihood of an overnight stay. Performing breast surgery under para-vertebral blockade alone without the use of general anaesthesia has also been reported, allowing the majority of patients to be discharged home on the day of surgery, a conclusion supported by others using similar techniques. In a limited recent study there appeared to be no extra benefit from an additional continuous para-vertebral blockade lasting 48 hours when compared with a single injection.

Better control of nausea and vomiting following general anaesthesia has been achieved over the last few years but further improvements are still required. Avoidance of opioid analgesics is seen as crucial in this regard as they appear to be an important factor in producing nausea and vomiting thus preventing patients from returning home on the same day as their surgery.

In the current study, drains were removed prior to discharge home thus avoiding the need for drain removal at a subsequent visit. This seemed to be satisfactory and in line with current practice to limit the duration of drainage following breast and axillary surgery. Although it is acceptable for patients to go home with drains in situ, arrangements would be needed for subsequent drain removal to be undertaken. It was felt that this would detract from the acceptability of the day-case pathway and might also increase costs.

The current study suggests that successful completion of the day-case pathway is less likely to occur if surgery is performed later in the day. Scheduling theatre lists for morning sessions would minimise the chances of an unplanned overnight stay but such planning of lists is not always feasible due to other constraints. An alternative would be to provide extended post-operative recovery facilities, perhaps to 10pm, although it is recognised that
some patients, especially the elderly, may not wish to travel home at such a late hour.

It is important to note that for some patients day-case surgery is not always an option due to their underlying co-morbidities and logistical problems. Despite initially agreeing in principle to the day-case pathway, a minority of patients were subsequently reluctant to return home the same day in the current series. Several factors may have been responsible for their decision such as their distance to travel home and the speed at which they had recovered from their anaesthetic.

In addition to careful selection of patients, appropriate patient preparation and education are vital to the success of day-care surgical pathways. It is important to instil confidence in patients and ensure that their expectations are realistic. Women reporting a positive experience with day-case breast cancer surgery were also those reporting good preparation along with adequate support.4,9

If patients are provided with structured and planned education, good outcomes of care can be achieved more effectively. Patients should be made fully aware of what they can expect both before and after surgery so they become more autonomous and therefore less vulnerable. Continued efforts are required to improve patient education in order to enhance the patients' perceived quality of care.4,8

Economic evaluations have shown that reducing length of stay after surgery for breast cancer can save considerable sums of money without increasing the expenses incurred by individual patients.4,8 Redress in terms that societal and healthcare costs have confirmed the cost-effectiveness of both day case breast surgery and short stay with discharge home within 24 hours.4,8 Potential cost savings are likely to prove a further incentive to adopt ambulatory care pathways as resources come under greater pressure.

Conclusions

This study has shown that with close attention to all parts of the patient pathway high rates of successful day surgery are feasible. A day case surgical pathway for intermediate breast and axillary surgery has many benefits and this study shows it to be safe. Undertaking surgical procedures in the morning rather than the afternoon, the use of pre-emptive analgesia and better control of post-operative nausea and vomiting should minimise the number of unplanned overnight stay episodes and will hopefully enable better levels of patient satisfaction and compliance.

Acknowledgements

The authors acknowledge the assistance of the following Breast Care Nurse Specialists in helping to implement the new day-case pathway: Jo Lobb, Jenny Richards, Cheryl Brown, Pat Coghill

References

5. Information Centre for Health and Social Care. www.icnhs.uk