Axillary Padding as an Alternative to Closed Suction Drain for Ambulatory Axillary Lymphadenectomy

A Prospective Cohort of 207 Patients With Early Breast Cancer

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Hypothesis: Axillary lymphadenectomy performed without the use of a drain but with padding of the axilla is feasible and safe on an outpatient basis in the setting of conservative surgery for breast cancer.

Design: Prospective clinical study.

Setting: Public oncology center.

Patients: Two hundred seven patients were treated in our oncology center between January 11 and December 28, 1999, by means of this method of axillary lymphadenectomy based on axillary padding without a drain. One-day surgery was offered to each patient.

Intervention: At the end of each functional axillary lymphadenectomy, the axilla was padded with the use of axillary aponeurosis and local muscles. Axillary suction drains were not used at all in this series of patients.

Main Outcome Measures: Prospective assessment was performed, without randomization, with regard to the length of hospital stay, the reasons for postoperative conversion from 1-day surgery to traditional hospitalization, and postoperative complications.

Results: Eighty-seven (42.0%) of the 207 patients underwent a 1-day procedure. In the 1-day surgery group, 87 (84.5%) of the 103 patients benefited from a true 1-day surgery procedure. The main reasons for conversion were nausea and anxiety rather than surgical complications. Hospital stay never exceeded 3 days. The most common postoperative complication was axillary seroma, with an average incidence of 22.2%.

Conclusion: Breast-preserving surgery with axillary lymphadenectomy and padding of the axilla, precluding the use of a drain, is feasible and safe on a 1-day surgery basis for selected consenting patients.

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OLD-STANDARD treatment for early breast cancer is based on associating breast-preserving surgery with complete tumor excision and axillary lymphadenectomy followed by postoperative radiotherapy. A suction drain is systematically placed into the axilla to prevent the development of seroma. The drain is generally removed once seroma flow has fallen to less than 50 mL, and hospital discharge can then be permitted. Average hospital stay for this surgical procedure is approximately 1 week. One of the main disadvantages of this technique is that the drain remains the major obstacle to any reduction in the length of hospital stay for breast-preserving surgery. More than 10 years ago, our group described a surgical technique for closing the axilla after axillary lymphadenectomy without the use of a drain. This innovative technique, which consists of padding the axilla to close up the dead spaces, has resulted in a dramatic reduction in hospital stay to 3 days. To assess the feasibility and safety of breast-preserving surgery with axillary lymphadenectomy and padding of the axilla, precluding the use of a drain, we carried out a prospective study on the cohort of patients treated in our center in 1999, with a special focus on the length of hospitalization and postoperative complications.

RESULTS

Of the 207 patients, 103 were allocated to the OD group and 104 to the T group. Patients were not randomized but allocated to 1 of the 2 groups according to previously described criteria (Table 1).

Mean±SD age was 53.2±9.2 years (range, 33-83 years) in the OD group and
PATIENTS AND METHODS

Between January 11 and December 28, 1999, 207 patients underwent breast-preserving surgery with axillary lymphadenectomy closed with padding of the axilla without the use of a drain. All surgical procedures were performed by 2 senior surgeons with the patient under general anesthesia. Of the total of 207 patients, 160 underwent breast tumorectomy, 27 had margin reexcision, and 20 had axillary lymphadenectomy alone. In all cases, cancer had been diagnosed before surgery by means of microbiopsy or punch-biopsy techniques.

SURGICAL PROCEDURE

Breast tumorectomy or margin excision was systematically performed through an indirect periareolar or inframmary skin incision, and the wounds were closed without any form of drainage. Level I and II axillary functional lymphadenectomy was routinely performed through a horizontal axillary incision above the lower edge of the hairline. The axilla was closed by means of the padding technique. Axillary padding consisted of suturing the edges of the axillary aponeurosis with regional muscles with the use of 3 separate stitches of absorbable thread (Figure). The first stitch sewed the edge of the axillary aponeurosis to the lateral edge of the pectoralis major muscle; the second, the axillary aponeurosis to the serratus anterior muscle; and the third, the edge of the axillary aponeurosis to the anterior edge of the dorsalis major muscle. Subcutaneous tissue was then reapproximated. The skin was closed with an intradermal overcast of absorbable thread.

HOSPITAL STAY

One-day surgery was offered to each patient provided there were no contraindications. Contraindications to inclusion in the 1-day surgery group (OD group) were American Society of Anesthesiologists risk class III, distance between home and our center of more than 100 km or 1 hour, absence of an adult at home for the first postoperative night, and absence of a working telephone. Selection was made by both the surgeon and the anesthesiologist during the preoperative visit. One-day surgery was offered to eligible patients, who then completed a written informed consent form. Patients who refused 1-day surgery or were excluded from the selection were allocated to the traditional hospital-stay group (T group). Each patient’s general practitioner was informed of the chosen conditions of hospitalization.

In the OD group, patients were hospitalized at 7 AM and underwent surgery before midday. Patients were discharged 6 hours after surgery with the permission of both the surgeon and the anesthesiologist and were given 3 documents: the surgical protocol, the dressing prescription, and the postoperative appointment. In this group, hospitalization lasted 12 hours.

In the T group, patients were admitted to the hospital at 3 PM the day before and discharged at 2 PM the day after surgery. In this group, hospitalization lasted 45 hours.

EVALUATION

For both the OD and T groups, evaluation included the length of hospitalization, the reasons for converting from the OD to the T group, and postoperative complications, including wound infection, axillary seroma, hematoma, and wound healing. Axillary seroma was defined as a clinically palpable accumulation causing discomfort to the patient. The distinction was made between serious seroma, in excess of 80 mL or requiring more than 1 aspiration, and small seroma of 80 mL or less and needing only 1 aspiration.

The length of hospitalization accounts for a significant proportion of the cost of surgical treatment in the management of early breast cancer. Shortening the hospital stay has previously been shown to be an efficient way of reducing costs in the case of mastectomy.8-10 Axillary drains are the main obstacle to a reduction in the length of the hospital stay. Axillary seroma is the most frequently observed early complication after axillary lymphadenec-

(19.2%), and a problem related to the timing of the operative night in 42 (40.4%), inclusion in a clinical research protocol requiring 2-day hospitalization in 20 (19.2%), and a problem related to the timing of the operative schedule in 4 (3.8%).

Postoperative complications were assessed for all 207 patients (Table 2). These included axillary seroma (22.2%), hematoma (3.9%), abscess (1.9%), and delayed healing of the wound (4.3%). Small seromas were more frequent in the OD group, occurring in 21 patients (20.4%) in the OD group and 9 (8.7%) in the T group. All complications were treated with medical or nursing care, except for 1 case of breast hemostasis in the T group that required further surgery. Surgical hemostasis was performed on the afternoon of the same day. Only 1 patient in the OD group required emergency rehospitalization as the result of a complication. This patient developed a hematoma of the breast. After simple nursing care without further surgery, she was discharged the following day. There were no axillary complications requiring rehospitalization or further surgery.

No patients in either group remained in the hospital for more than 48 hours. Of the 103 patients in the OD group, 16 remained in the hospital for 1 night after surgery. The reasons for these 16 conversions were nausea in 7 patients (6.8%), bleeding in 1 (1.0%), pain in 3 (2.9%), and a change of mind because of anxiety after signing the consent form in 5 patients (4.9%). Of the 103 patients in the OD group, 87 (84.5%) experienced genuine 1-day surgery.
tomy and is routinely treated by insertion of a suction drain,4,5 which can be removed once lymph production falls to less than 35 to 50 mL, a level generally reached between 3 and 17 days after surgery.11-13

To reduce the length of hospitalization after axillary lymphadenectomy, early discharge with the drain in situ has been studied.14-16 The drain is subsequently removed 3 to 7 days after surgery. The main disadvantages of this solution are discomfort for the patients, with difficulties undressing or using the toilet, and the transfer of the cost from the hospital to the nurses or practitioners in charge of monitoring the dressings and the drain.

Unfortunately, drains have failed to systematically prevent the formation of seromas. Once the drain has been removed, between 28% and 73% of seromas still require aspiration.17,18 The use of 1 or 2 drains, low- vs high-vacuum drainage, or the association with an external compression dressing has failed to show any difference in seroma production after removal of the drains.19-21 Such observations have raised questions as to whether early movement of the arm and shoulder after discharge increases the risk of seroma.24-26 We have therefore adopted a preventive approach and advise our patients to restrict arm and shoulder motion to gentle movements until the first postoperative visit. The 1.9% rate of infection in our series is consistent with other published results, which range from 0.8% to 8%.12,27,28 Techniques precluding the use of a drain do not increase the risk of infection.

In the present study, this technique resulted in only 22.2% of seromas requiring postoperative aspiration. The number of small seromas (≤80 mL) requiring a single percutaneous aspiration was significantly higher in the 1-day surgery group. This raises the question as to whether early movement of the arm and shoulder after discharge increases the risk of seroma.24-26 We have therefore adopted a preventive approach and advise our patients to restrict arm and shoulder motion to gentle movements until the first postoperative visit. The 1.9% rate of infection in our series is consistent with other published results, which range from 0.8% to 8%.12,27,28 Techniques precluding the use of a drain do not increase the risk of infection.

This substantial technical simplification allows a considerable reduction in the duration of hospital stay. As a result, the costs related to this surgical procedure have been reduced and postoperative care has been made easier. Patients are discharged with a simple dressing that requires changing by a nurse only once or twice a week before being removed.

In our experience, only 20.2% of patients (21 of the 104 T-group patients) initially refused 1-day surgery for personal reasons, preferring to spend the first postoperative night in the hospital. Patients need to be informed by their physician or surgeon about the advantages of 1-day surgery and encouraged to try it.29,30 The

![Surgical technique for padding of the axilla. 1 Indicates suturing of the axillary aponeurosis to the pectoralis major muscle; 2, the axillary aponeurosis to the serratus anterior muscle; and 3, the axillary aponeurosis to the dorsalis major muscle.](https://archsurg.jamanetwork.com/)

Table 1. Disease Characteristics

<table>
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<th>Characteristic</th>
<th>1-d Surgery (n = 103)</th>
<th>Traditional Surgery (n = 104)</th>
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<td>Mean No. of nodes excised</td>
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Table 2. Postoperative Complications

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<td>Delayed wound healing</td>
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<td>0</td>
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<tr>
<td>Seroma ≤80 mL</td>
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<td>9</td>
</tr>
<tr>
<td>Seroma &gt;80 mL</td>
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simplified postoperative care after axillary lymphadenectomy is a definite argument in favor of 1-day surgery. With the exception of patients switching from their initial choice because of postoperative anxiety, the rate of postoperative conversion from outpatient to inpatient depends more on the occurrence of nausea and pain than on surgical complications. Certain authors have suggested using local-regional anesthesia, which provides effective postoperative analgesia and less nausea.6,31 The development of a seroma has never been the reason for extending the length of hospitalization.

In conclusion, padding the axilla enables the wound to be closed without the need for a drain. Postoperative care and dressings are thus simplified, allowing early discharge from the hospital. With effective selection, nearly 85% of consenting patients requiring breast-preserving surgery with axillary lymphadenectomy for early breast cancer should be able to benefit from 1-day surgery. Considering the low risk of complications, 1-day surgery for axillary lymphadenectomy with padding and precluding the use of a drain appears to be both feasible and safe.

The development of 1-day surgery for breast cancer represents both a technical and an educational challenge if we are to reach the objectives of reducing health care costs while improving health-related quality of life for the patient. Further prospective and randomized studies are needed to confirm the value of padding compared with the use of a suction drain.

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REFERENCES