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COMPARATIVE OUTCOMES OF SENTINEL LYMPH NODE BIOPSY AND AXILLARY LYMPH NODE DISSECTION IN BREAST CANCER: A RETROSPECTIVE ANALYSIS"

General Surgery

Dr. Sanchita Kharoliwal Juniour Resident General Surgery Department, Mahatma Gandhi Hospital, Jaipur

Dr. Paresh Sharma* Juniour Resident General Surgery Department, Mahatma Gandhi Hospital, Jaipur *Corresponding Author

Dr. Sanjay Singhal Professor And Head, General Surgery Department, Mahatma Gandhi Hospital, Jaipur

ABSTRACT

This retrospective study compares the outcomes of sentinel lymph node biopsy (SLNB) and axillary lymph node dissection (ALND) in breast cancer patients. A total of 134 patients were analyzed: 31 underwent SLNB alone, and 103 had SLNB followed by ALND. The study found that SLNB patients were older (62.5 vs. 57.8 years, P = 0.015) and had less advanced tumors. Mastectomy was more common in the ALND group (34.9% vs. 27.4%), while breast-conserving surgery was more frequent in the SLNB group (72.6% vs. 65.1%, P = 0.42). Chemotherapy was administered more frequently in the ALND group (33.0% vs. 3.2%, P < 0.001). SLNB successfully identified at least one sentinel node in 92.3% of cases, with a false-negative rate of 10.8%. The SLNB group had significantly fewer complications, shorter hospital stays (5.5 vs. 9.2 days, P < 0.001), and faster recovery. Lymphedema was observed only in ALND patients (3.8%). Both groups had no axillary recurrences during follow-up. These findings support SLNB as a safer, less invasive alternative to ALND with comparable oncological outcomes.

KEYWORDS

Sentinel Lymph Nodes, Axillary Lymph node dissection, Breast cancer management

INTRODUCTION

Axillary lymph node dissection (ALND) has long been a standard in breast cancer surgery, offering tumour control and staging. However, its significant morbidity, including lymphedema, chronic pain, and limited arm mobility, affects up to 30% of patients. Advances in imaging and the emergence of sentinel lymph node biopsy (SLNB) now challenge ALND's necessity in patients with clinically negative axillae.

SLNB is a minimally invasive technique that identifies and examines the sentinel lymph node, the first to receive drainage from the tumour. Studies show that SLNB provides comparable oncological outcomes to ALND, including similar recurrence rates, but with lower morbidity, shorter hospital stays, faster recovery, and fewer long-term complications.

While SLNB is widely adopted, further long-term studies are needed to solidify its role. For now, SLNB represents a safer, less invasive alternative, promising better quality of life for breast cancer patients without compromising treatment efficacy

MATERIAL AND METHODS

Study Design And Patient Selection

This retrospective study included patients with invasive breast cancer who underwent breast-conserving surgery or mastectomy with sentinel lymph node biopsy (SLNB), with or without axillary lymph node dissection (ALND). Patients with tumour size ≤4 cm, clinically and sonographically negative axilla, no prior chemotherapy or radiotherapy, and informed consent were included.

Two Groups Were Analysed:

Group A: SLNB without ALND (negative sentinel nodes).
Group B: SLNB followed by ALND (positive sentinel nodes or validation cohort).

Sentinel Lymph Node Identification and Surgical Procedure

SLNs Were Identified Using:

1. **Radio Colloid Method:** Peritumoral injection of 99mTc-labeled colloidal albumin 16–24 hours preoperatively, with intraoperative detection using a gamma probe
2. **Blue Dye Method:** Peritumoral injection of isosulfan blue immediately before surgery.

Lymph nodes were classified as sentinel if they were radioactive (≥2× background counts), blue, or both. Positive SLNs underwent further histopathological evaluation, including immunohistochemistry, with ALND performed for metastasis.

Adjuvant Therapy And Follow-up

Breast-conserving therapy patients received 50–60 Gy of radiotherapy. Systemic adjuvant therapy was administered per guidelines. Follow-ups included clinical exams, imaging, and axillary assessments every 3–6 months for 5 years, then annually.

Assessment Of Morbidity

1. **Objective:** Arm volume (measured geometrically), muscle strength (3-kg resistance abduction), and range of motion.
2. **Subjective:** Patient questionnaires on symptoms like pain, lymphedema, and daily activity impact.

Statistical Analysis

Chi-square, Fisher's exact tests, and Mann-Whitney U tests were used, with significance set at P < 0.05.

This study evaluated morbidity and oncological outcomes associated with SLNB and ALND in breast cancer patients

RESULTS

A total of 134 patients were analysed, with 31 undergoing sentinel lymph node biopsy (SLNB) only and 103 undergoing SLNB followed by axillary lymph node dissection (ALND). The SLNB group had a higher mean age (62.5 vs. 57.8 years, P = 0.015). Tumour characteristics differed significantly, with more advanced pT1c tumours in the SLNB + ALND group (P = 0.01).

Mastectomy was performed in 27.4% of SLNB patients and 34.9% of SLNB + ALND patients, while breast-conserving surgery was more frequent in the SLNB group (72.6% vs. 65.1%, P = 0.42). Chemotherapy was more common in the SLNB + ALND group (33.0% vs. 3.2%, P < 0.001). SLNB successfully identified at least one sentinel node in 92.3% of patients, with a false-negative rate of 10.8%.

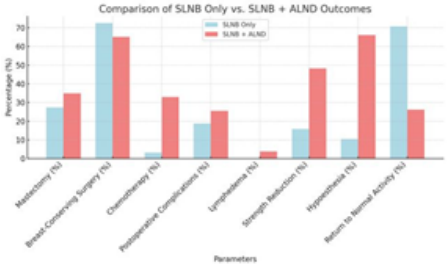
Postoperative complications were less frequent in the SLNB group (18.7% vs. 25.5%). SLNB patients had shorter hospital stays (5.5 vs. 9.2 days, P < 0.001) and wound drainage durations (3.2 vs. 7.0 days, P < 0.001).

Lymphedema occurred in 3.8% of SLNB + ALND patients and none of the SLNB group. Strength reduction and hypoesthesia were significantly higher in the ALND group (P < 0.05). SLNB patients returned to normal activities faster (P < 0.001). No axillary recurrences occurred during follow-up.

DISCUSSION

The results highlight the significant advantages of sentinel lymph node biopsy (SLNB) over axillary lymph node dissection (ALND) in breast

cancer management. SLNB demonstrated reduced postoperative complications, shorter hospital stays, and faster recovery times, with no compromise in oncological outcomes [1]. Long-term morbidity, including lymphedema, strength reduction, and hypoesthesia, was notably higher in the ALND group, reflecting the less invasive nature of SLNB [2]. The absence of axillary recurrences in both groups confirms the efficacy of SLNB in appropriate cases. These findings support SLNB as the preferred approach for patients with clinically negative axillae, minimising morbidity while ensuring effective treatment.



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