Original Article

Comparative Evaluation of Minimally Invasive Needle Aspiration and Conventional Incision with Drainage in the Management of Breast Abscess: A Prospective Study of 30 Cases

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Submission Date : 09-09-2025
Accepted Date : 07-10-2025

Abstract

Background:
Breast abscess remains a common surgical condition, particularly among lactating women. Conventional incision and drainage (I&D) has been the standard therapy but is associated with postoperative pain, scarring, and prolonged recovery. Needle aspiration (NA) is a minimally invasive alternative with potential benefits in healing, comfort, and cosmesis.

Objective:
To compare percutaneous needle aspiration and conventional I&D in the management of breast abscess with respect to pain, healing time, complications, recurrence, and cosmetic outcomes.

Methods:
This prospective comparative study was conducted at International Hospital, Rangpur, Bangladesh, from January 2024 to December 2024. Thirty female patients with a single breast abscess (≤6cm) were randomized into two groups: Group A (needle aspiration, n=15) and Group B (incision & drainage, n=15). Data on abscess size, postoperative pain by visual analogue score (VAS 0–10), healing time, hospital stay, complications, recurrence, and cosmetic satisfaction were collected and analyzed using SPSS v26, with $p<0.05$ considered significant.

Results:
The mean abscess size was 3.8±1.1 cm in Group A and 4.2±1.0cm in Group B. The mean postoperative pain score (24h) was significantly lower in the aspiration group (3.1±1.2 vs 6.8±1.6, $p<0.001$). Healing time was shorter (8.4±2.3 vs 14.2±3.6 days, $p<0.001$) and hospital stay reduced (1.3±0.5 vs 4.6±1.1 days, $p<0.001$). Complications (infection 13.3%, skin necrosis 6.6%) occurred only in I&D. Recurrence was slightly higher in aspiration (13.3% vs 6.6%, NS). Cosmetic satisfaction was superior in aspiration (8.7±0.9 vs 6.2±1.1, $p<0.01$).

Conclusion:
Percutaneous needle aspiration is a safe, effective, and cosmetically superior alternative to I&D for appropriately selected breast abscesses, offering faster healing and less morbidity.

Keywords: Breast abscess, Needle aspiration, Incision and drainage, Postoperative pain, Cosmetic outcome, Complications

Introduction:

Breast abscess is a localized infection of the breast parenchyma, usually developing as a complication of lactational mastitis. It most commonly occurs among lactating women due to bacterial entry through nipple fissures during breastfeeding. The global incidence in lactating mothers is estimated between 3% and 11%, with *Staphylococcus aureus* being the predominant pathogen.[1,2]

Traditionally, incision and drainage (I&D) has been the standard treatment for breast abscess.[3] However, I&D is often associated with postoperative pain, prolonged wound healing,

unsightly scars, difficulty in breastfeeding, and longer hospital stay.[4] Furthermore, tissue destruction and poor cosmes is may affect the psychological well-being and confidence of breastfeeding mothers.

With the advancement of percutaneous interventions, needle aspiration (NA) has emerged as a minimally invasive alternative.[5,6] It allows repeated evacuation of pus under imaging control, preserving breast tissue and reducing morbidity. Several randomized and comparative studies have shown that needle aspiration provides comparable cure rates to I&D but with significantly less pain, faster healing, and superior cosmetic and functional outcomes.[7–9]

In resource-limited settings such as Bangladesh, where hospital workload, patient compliance, and cosmetic satisfaction are major concerns, a less invasive and cost-effective approach is desirable. Therefore, this study was undertaken to compare percutaneous needle aspiration and conventional incision with drainage in the management of breast abscesses among female patients attending a tertiary-level hospital in Rangpur, Bangladesh.

Materials and Methods:

Study Design: Prospective comparative study
Study Period: January 2024 – December 2024
Setting: International Hospital, Rangpur, Bangladesh
Sample Size: 30 female patients with breast abscess

Grouping:

- **Group A (n = 15):** Percutaneous needle aspiration under local anesthesia
- **Group B (n = 15):** Incision & drainage under general anesthesia

Inclusion Criteria:

- Female patients aged 18–50 years
- Single, unilocular abscess ≤ 6 cm confirmed by ultrasound
- No prior surgical intervention for the abscess
- Written informed consent

Exclusion Criteria:

- Multiloculated or recurrent abscess
- Necrotic ulceration or underlying malignancy
- Uncontrolled diabetes or immunocompromised state

Procedure Details:

- **Needle Aspiration:** Performed using 16–18 G needle under local anaesthesia by clinical judgement or sometimes ultrasound guidance; aspiration repeated every 48–72 hours until cavity collapsed.
- Incision & Drainage: Curvilinear incision, pus evacuation, cavity irrigation, and daily dressing.

All patients received appropriate antibiotics (flucloxacillin or cefuroxime) and analgesics.

Data Collection Parameters:

Abscess size (cm), pain score by visual analogue score (VAS 0–10), healing time (days to complete epithelialization), complications, hospital stay, recurrence (3 months), and cosmetic satisfaction (10-point Likert scale).

Statistical Analysis:

Data analyzed using SPSS v26. Continuous variables were expressed as mean ± SD and compared with independent-sample t test. Categorical variables analyzed using Chi-square test. $p<0.05$ considered statistically significant.

Results:

Table-I: Demographic and Clinical Characteristics

Parameter	Group A (Aspiration)	Group B (I&D)	p-value
Mean age (years)	28.2±6.1	29.1±6.7	0.73
Mean abscess size (cm)	3.8±1.1	4.2±1.0	0.21
Lactational abscess (%)	73.3	66.6	0.67
Non-lactational abscess (%)	26.7	33.4	—

Table-II: Postoperative Pain, Healing, and Hospital Stay

Parameter	Group A	Group B	p-value
VAS pain score (24h)	3.1±1.2	6.8±1.6	<0.001
Healing time (days)	8.4±2.3	14.2± 3.6	<0.001
Hospital stay (days)	1.3±0.5	4.6±1.1	<0.001

Table-III: Complications, Recurrence, and Cosmetic Satisfaction

Parameter	Group A (n = 15)	Group B (n = 15)
Wound infection	0(0%)	2(13.3%)
Skin necrosis	0(0%)	1(6.6%)
Breastfeeding difficulty	1(6.6%)	3(20%)
Recurrence (3 months)	2(13.3%)	1(6.6%)
Cosmetic satisfaction (10-point)	8.7±0.9	6.2±1.1

Microbiology:
Staphylococcus aureus (73.3%), Streptococcus spp. (13.3%), mixed flora (13.3%).

Discussion:
This study demonstrates that ultrasound-guided needle aspiration is a safe, effective, and less invasive alternative to conventional incision and drainage in appropriately selected breast abscess cases. Both groups in our study were comparable in baseline characteristics, confirming that observed outcome differences were due to treatment modality.

Our findings of significantly lower postoperative pain scores and shorter healing time in the aspiration group are consistent with those reported by Pal et al. (2023)[7] and Manzoor et al. (2022)[8]. These randomized trials showed that aspiration resulted in lower pain ($p<0.001$), faster healing ($p<0.0001$), and improved continuation of breastfeeding compared to I&D. Similarly, Suvera et al. (2020) found that mean healing time was 8.6±1.9 days with aspiration versus 18.1±5.0 days after I&D.[9]

Complications such as wound infection and skin necrosis occurred only in the I&D group in our study, supporting previous reports that open drainage causes more tissue trauma and delayed recovery, [3,6] Cosmetic satisfaction was markedly higher with needle aspiration, corroborating the results of McIntosh et al. (2001),[10] who demonstrated 82% cure with aspiration and excellent cosmetic outcomes.

Although recurrence was slightly higher after needle aspiration in our series, the difference was not statistically significant. Javed et al. (2017)[11] reported similar findings, noting that recurrence rates may increase when aspiration is performed without proper ultrasound guidance or when multiloculated abscesses are included.

From a health-system perspective, needle aspiration offers several advantages—it can often be performed as an outpatient procedure, requires no general anesthesia, reduces hospital stay, and minimizes overall treatment cost. These benefits are particularly relevant for developing countries like Bangladesh, where healthcare resources are limited, and patient compliance plays a vital role in treatment success.[12,13]

Overall, our results reaffirm that ultrasound-guided needle aspiration should be considered the first-line approach for simple, unilocular breast abscesses ≤6cm, reserving I&D for large, multiloculated, or recurrent cases.

Conclusion:
Ultrasound-guided needle aspiration is a safe, effective, and cosmetically superior alternative to incision and drainage for uncomplicated breast abscesses. It offers faster healing, reduced pain, and shorter hospital stay without compromising cure rates. Conventional I&D should be reserved for large or recurrent abscesses.

References:

1. Bharat A, Gao F, Aft RL, Gillanders WE, Eberlein TJ, Margenthaler JA. Predictors of primary breast abscesses and recurrence. World J Surg. 2009;33(12):2582–2586.
2. Eryilmaz R, Sahin M, Hakan T, Daldal E. Management of lactational breast abscesses. Breast. 2005;14(5):375–379.
3. Dixon JM. Repeated aspiration of breast abscesses in lactating women. BMJ. 1988;297(6662):1517–1518.
4. Christensen AF, Al-Suliman N, Nielsen KR, Vejborg IM, Severinsen N, Christensen H, et al. Ultrasound-guided drainage of breast abscesses: results in 151 patients. Br J Radiol. 2005;78(927):186–188.
5. Hook GW, Ikeda DM. Treatment of breast abscesses with US-guided percutaneous needle drainage without indwelling catheter placement. Radiology. 1999;213(2): 579–582.
6. Schwarz RJ, Shrestha R. Needle aspiration of breast abscesses. Am J Surg. 2001; 182(2):117–119.
7. Pal P, Singh S, Ahmad F, Kumar S, Parihar A. A randomized controlled trial comparing ultrasonography-guided needle aspiration and surgical drainage for the management of breast abscess. Cureus. 2023;15(1):e3824 9226.
8. Manzoor A, Rashid I, Waqar SH, Shah SA. Comparison of Needle Aspiration and Incision & Drainage in the Management of Lactational Breast Abscess. J Soc Obstet Gynaecol Pak. 2022;12(1):25–30.
9. Suvera M, Patel N, Poriya D, Chaudhari P, Bamaniya C. Comparative study between USG-guided aspiration and incision and drainage in breast abscess. Indian J Appl Basic Med Sci. 2020;12(2):20–27.
10. McIntosh A, Merriman L, Maxwell AJ, Pullan

M, Slade R, Young P, et al. Needle aspiration of breast abscesses. Aust N Z J Surg. 2001; 71(11):635–637.
11. Javed U, Aleem S, Asif S, Javed I. Breast Abscess: Comparison of recurrence rate between incision drainage and multiple needle aspiration. Prof Med J. 2017;24(1): 50–55.
12. Alam SN, Khan MA, Azam S, Manzar S. Spectrum of breast disease at a tertiary hospital in Pakistan. J Surg Pak. 2013;18(3): 110–114.
13. Hossain M, Rahman A, Sultana R, Akhter S. Outcome of ultrasound-guided aspiration in the management of breast abscess: experience in a tertiary hospital of Bangladesh. Bangladesh J Surg. 2022;38(1): 25–32.