Original Article

# A COMPARATIVE ANALYSIS OF ASPIRATION AND INCISION AND DRAINAGE TECHNIQUES FOR BREAST ABSCESS MANAGEMENT A RANDOMIZED CONTROLLED TRIAL

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## ABSTRACT

***Objectives:*** *To conduct a comparative analysis of the outcomes associated with needle aspiration and surgical incision and drainage of breast abscess.*

***Study Design:*** *Randomized controlled trial.*

***Place and duration of study:*** *The present investigation was carried out at the Department of Surgery, Services Institute of Medical Sciences, Lahore, spanning a duration of six months from July 2020 to January 2021.*

***Methods:*** *The research comprised a cohort of 60 female patients, aged 18 to 65 years, who presented with unilateral breast abscess. These patients were separated into two equal groups, each consisting of 30 individuals. The female participants in Group-NA had ultrasonic-guided needle aspiration, while the female participants in Group-I&D underwent incision and drainage of the breast abscess. The main variables assessed in this study were the duration of the surgery and the length of hospitalization for both groups.*

***Results:*** *The age range in this research was 25–58 years old, with a mean±SD of 39.93±13.97 years. Group-NA had an abscess of 7.2±1.71 cm, while Group-I&D had an abscess measuring 6.96±1.56 cm. The study's major findings indicate that Group-N A needed considerably less time for the surgery (7.2±1.54 Vs 19.96±2.77 minutes, p=0.000) than Group-I&D. Similarly, Group-NA's mean hospital stay length was considerably shorter than Group-I&D's (1.63 ± 1.06 Vs. 3.23 ± 1.38 days, p=0.000).*

***Conclusion:*** *The main benefits of needle aspiration over incision and drainage procedures for female patients with breast abscesses include shorter operation times and shorter hospital stays.*

***Keywords:*** *Breast abscess, Incision & Drainage, Needle aspiration.*

## INTRODUCTION

Breast abscesses are localized infections produced by purulent fluid in breast tissue. Lactating moms often suffer breast infections and abscesses.[1] Abscesses are major causes of morbidity and lactation interruption in nursing moms.[2] The largest worldwide incidence of mastitis occurs among women in their early postpartum weeks, and 3-11% of cases become breast abscesses.[3] Although incidences are declining in industrialized countries, they remain a major issue in underdeveloped nations. In Ethiopia, over 3% of emergency admissions were breast abscesses, making it the 9th most common cause for general surgery hospitalizations. Khan ZM found 10.2% in Pakistan.[2,4] Nearly 0.4% of nursing moms have puerperal breast abscesses.5 Older premenopausal women also get non-lactational abscesses. Peripheral and central peri-areolar non-lactational abscesses exist.[1]

Puerperal and non-puerperal abscesses have various causes. Lactating mothers get puerperal abscesses from breast irritation or untreated mastitis. Staphylococcus aureus spreads in lactoserum media

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via nipples. Other puerperal abscess bacteria include S epidermidis and streptococci.[6] No known cause, non-puerperal abscesses are caused by autoimmunity, infections, or hypersensitivity responses.[7]

Untreated breast abscesses may progress and cause tissue and skin loss, requiring breast reconstruction and resurfacing.[8] Ultrasonography (US) confirms breast abscess after patient complains of chills, fever, and malaise. US allows anti-inflammatory and antibiotic treatment in the early cellulitic phase, avoiding needless operations.[9]

Incision and drainage (I & D) is the best therapy for both forms of breast abscess if USG shows pus. This approach works, but it requires general anesthesia, stresses the patient, takes longer to recover, requires lengthier hospitalization, and requires dressing changes for many days. Breast feeding is interrupted, surgical wounds scar, and breast deformity is possible.

Due to the aforesaid drawbacks, needle aspiration (NA) has been utilized successfully without these issues. Some trials revealed a decreased cure rate of up to 82% with NA, but real-time high-resolution US has improved NA's performance, thus surgeons now utilize it more often.Colin C reported on a study of 92 patients with puerperal breast abscesses who were treated by US-guided NA, vacuum-assisted aspiration, or pigtail catheters. US-guided operations allowed 96% of patients to recover (47% were cured in the first round, 53% required several procedures). The treatment effectively treated abscesses up to 5cm without requiring breastfeeding interruption.[13] Thus, US-guided NA cures well. Besides the cure rate, US guided NA speeds up the operation and minimizes hospital stay. This eases surgeon and patient load.

US guided NA has been shown to have a high cure rate and shorten healing time, but few studies have compared its surgeon time and hospital stay to conventional I&D in our local population.[14]

This research was aimed to evaluate US-guided NA and I&D for breast abscess treatment in terms of operation time and DHS. The discoveries will help surgeons treat breast abscesses faster and cheaper.

## METHODOLOGY:

The Department of Surgery, Services Institute of Medical Sciences (SIMS), Lahore undertook this 6-month randomized controlled experiment from July 2020 to January 2021.

A total of 60 women aged 18–65 with unilateral breast abscess were consecutively sampled and randomized into two equal groups of 30 patients each using a computer-generated randomization sheet.

Exclusion criteria Females with worrisome lesions/malignancy, recurring breast abscesses (history), burst abscesses (clinical examination), TB history, complex breast abscesses, ulceration, necrosis, and pregnancy were included.

Group-NA patients had US-guided needle aspiration, whereas Group-I&D patients had incision and drainage.

Each Group-NA participant used a 20 ml syringe and 18 G needle. After supporting the breast using index and thumb, the abscess was located. A needle was inserted into the abscess via normal skin under 2% lidocaine. The procedure continued until no pus was aspirated. If needed, aspiration was repeated every other day until the mass dissolved or three needle aspirations were done (if lump still not gone, therapy failed).

In Group-I&D, the abscess was located and excised along the areolar border and skin line under general anesthesia. Pus was evacuated when digital or artery forceps broke down the loculi. The wounds were drained and treated every other day until cleansed and granulated.

After the surgeries, all patients were prescribed oral amoxicillin (500 mg)-clavulanate (125 mg), diclofenac (50 mg), and pantoprazole (40 mg) for 2 days.

The surgical team's procedure time and patient hospital stay were the main outcomes.

Inclusion criteria for breast abscess patients include discomfort (VAS > 3) and swelling across the breasts, with an abscess size of 10 cm or less on US.

The operation was timed from when the surgeon stabilized the breast for aspiration/incision until final dressing.

From procedure admission to discharge without complications, DHS was assessed.

The hospital ethics committee approved the trial.

Study participants gave signed permission after being informed of its objective. Data was analyzed

using SPSS 25. Quantitative variables were mean and standard deviation, whereas qualitative variables were frequency and percentage. An independent t-test was used to determine the difference between the two groups, with a significance level of $p \leq 0.05$.

## RESULTS

The Mean±SD of age in this study was 39.93±13.97 years with an age range of 25 to 58 years. The demographic details and base line clinical characteristics are shown in Table-I.

The results of primary outcomes of the study show significantly less time consumed in performing the procedure and significantly less DHS in Group-NA compared to Group-I&D as shown in Table-II.

We also stratified the results according to size of abscess and results show that the time required for procedure was significantly less in Group-NA compared Group- I&D irrespective of the size of the abscess as shown in Table-III.

## DISCUSSIONS

Many studies have examined NA's high cure rate, but its consequences, such as surgeon time and DHS following the treatment, have been less investigated than standard I&D.

Saeed S et al. compared NA with I&D for treating breast abscesses ≤5 cm in diameter. This Pakistani research found similar recovery times for both groups. NA was easier for the surgical team and patients, according to the study.[15]

R. Karvande compared standard I&D versus US-guided NA for treating breast abscesses ~10 cm. The research found that the NA group had considerably shorter procedure time (6.63±01.61 vs 18.87±2 minutes, p=0.000) and lower DHS (0.2±0.55 vs 1.16±0.37 days, p=0.000) compared to the I&D group.[14]

Fardhus et al. compared NS and I&D procedures to discover the faster therapy. The research found that the NA approach took much less time than the I&D technique (6.62±1.5 min vs 18.81±2.10 min). NA was described as a straightforward, anesthetic-free treatment that may be done without US. [16]

In their research on non-puerperal breast abscess care trends, Saboo A noted that NA reduces hospital stay compared to surgery.[17]

In December 2023, Ubaid M and colleagues compared US-guided NA versus standard I&D breast abscess treatment. The research found that the NA approach resulted in a considerably shorter process time compared to I&D (7.72±1.96 vs 22.22±3.07

**Table 1: Demographics and baseline clinical characteristics n=60**

| Demographics and baseline clinical characteristic | | Group-NA n=30 | Group- I&D n=30 |
|---|---|---|---|
| Age (Mean±SD) years | | 38.80±13.01 | 41.07±13.85 |
| Parity (Mean±SD) | | 2.9±1.06 | 2.83±0.98 |
| Lactation | Yes n (%) | 15 (50) | 12 (40) |
| | No n (%) | 15 (50) | 18 (60) |
| Size of abscess (Mean±SD) cm | | 7.2±1.71 | 6.96±1.56 |
| Size of abscess | ≤5 cm n (%) | 8(26.66) | 8 (26.66) |
| | >5 cm n (%) | 22 (73.33) | 22 (73.33) |

**Table 2: Results of primary outcomes n=60**

| Primary outcomes | Group-NA n=30 | Group- I&D n=30 | p-value |
|---|---|---|---|
| Time required for procedure (Mean±SD) min | 7.2±1.54 | 19.96±2.77 | 0.000 |
| DHS (Mean±SD) days | 1.63±1.06 | 3.23±1.38 | 0.000 |

**Table 2: Time required for procedure as per size of abscess n=60**

| Time required for procedure as per size of abscess | Group-NA n=30 | Group- I&D n=30 | p-value |
|---|---|---|---|
| ≤5 cm (Mean±SD) min | 6.62±1.30 | 19.37±3.2 | 0.000 |
| >5 cm (Mean±SD) min | 7.40±1.59 | 20.18±2.64 | 0.000 |

min, p-0.001). A substantial difference in hospital stay duration was seen between the NA and I&D groups (1.36±0.49 days vs 2.01±0.39 days, p-0.001).18 The age range in our research was 25-58 years, with a mean±SD of 39.93±13.97 years. In Group-NA, the abscess size was 7.2±1.71 cm, whereas in Group-I&D, it was 6.96±1.56 cm. The majority of patients (73.33%) had an abscess > 5 cm in diameter. Primary study findings indicate considerably shorter procedure time in Group-NA compared to Group-I&D (7.2±1.54 vs 19.96±2.77 minutes, p= 0.000). These findings are consistent with NA breast abscess treatment research.14,15,16,18 The technique took less time for abscesses ≤5 cm and > 5 cm to 10 cm after we stratified the findings by size.

Mean DHS was considerably lower in Group-NA compared to Group-I&D (1.63 ± 1.06 vs 3.23 ± 1.38 days, p=0.000). Previous study noted that shorter DHS reduces surgeon workload and patient psychological and financial stress. [14,15,17,18]

This provides surgeons and patients with proof for a better breast abscess therapy than standard methods.

The method also allows the sample to be submitted for cancer detection, avoiding surgery.

The European Journal of Breast Health reported that if primary health care clinicians refer cases early before complications, breast abscesses can be resolved with needle aspiration and an antibiotic, preserving the breast's natural shape and skin.[19]

This research is limited by its small sample size and short follow-up. Further research with longer follow-up and more patients may provide more valuable data.

## CONCLUSION

In female breast abscess patients, NA is faster and less hospitalized than I&D. The procedure may be prioritized since it can be done immediately without operating theater setups or particular abilities.

Conflict of interest:

## Acknowledgments

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