ORIGINAL ARTICLE https://doi.org/10.3329/jmcwh.v22i1.87334

OUTCOME OF ULTRASOUND GUIDED PERCUTANEOUS NEEDLE ASPIRATION VERSUS CONVENTIONAL INCISION AND DRAINAGE IN THE MANAGEMENT OF SMALL BREAST ABSCESS

Rashna Sharmin[1*], Gobinda Chandra Saha[2], Mohammad Mashiur Rahman[3], Sabrina Razzaque[4]

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Reviewed by

Mahmuda Abira
BIRDEM General Hospital
Dhaka, Bangladesh.

Mohammad Nuruzzaman
Medical College for Women & Hospital
Dhaka, Bangladesh.

***Corespondence:**
Rashna Sharmin
Email: rashnasharmin92@gmail.com
Orcid id: https://orcid.org/0009-0007-3073-3837

Received: 18.09.2025
Accepted: 30.12.2025
Published: January 2026

Cite this article:
Sharmin R, Saha GC, Rahman MM, Razzaque S. Outcome of ultrasound guided percutaneous needle aspiration versus conventional incision and drainage in the management of small breast abscess. J Med Coll Women Hosp.2026;22(1): 108-115.

ABSTRACT

Background: Breast abscesses, are a very common clinical entity identified in daily practice. At an initial presentation it may be treated conservatively with antibiotics. Minimal invasive surgery is replacing the traditional management. **Aim:** Making comparison between the outcome and effectiveness of 2 methods of managing breast abscess that is by means of aspiration using needle percutaneously under the guidance of ultrasonography and incision followed by drainage of breast abscess that is done conventionally. **Materials and Method:** This Quasi-experimental research took place between 2023 (July) and 2024 (July) in Surgery department of SSMC (Sir Salimullah Medical College) hospital, Mitfort in Dhaka. A total 50 female patients with the diagnosis of breast abscess were included according to selection criteria and then divided into 2 groups by alternative consecutive manner (Group-A and Group-B). In group A, patients were treated by ultrasound guided percutaneous aspiration with 19G needle under local anesthesia. In group-B, patients were treated by conventional incision and drainage under general anesthesia. Data was sorted and analyzed by SPSS 26 version. Independent sample t test and Chi-Square test were performed as applicable. **Results:** In this study, mean duration of procedure was 15.64±3.33 min in group A and 31.48±7.05 min in group B. VAS score was 2.72 ± 1.28 in group A and 5.28 ± 1.28 in group B. The time required for the procedure and visual analogue scale (VAS) score in Group A were significantly ($p<0.001$) less than Group B. In Group A, complete abscess resolution occurred with 1 aspiration, 2 aspirations and 3 aspirations in case of 36% , 40% and 8% subjects respectively. However, in 16% cases resolution of abscess did not occur even when individuals underwent 3 aspirations. These individuals therefore were managed by Incision followed by Drainage and their follow up schedule was like group B. We observed that all lactating women continued their breastfeeding from the day of aspiration (0.00±0.00 Post Operative Day) in group A than women who underwent incision followed by drainage in group B (12.33±2.32). In this study, mean visit to hospital was 4.88±2.35 times in group A and 12.96±3.88 times in group B and duration of complete resolution was 14.48±3.73 days in group A and 24.60±3.92 days in group B which was significant statistically ($p<0.001$). We observed that all patients had satisfactory cosmesis after aspiration and all the patients developed scar mark after incision and drainage. **Conclusion:** Aspiration using needle percutaneously under the guidance of ultrasonography was found to be simple, safe, effective and could be a widely accepted procedure for management of small breast abscess.

Kewwords: Breast abscess, Ultrasound guided aspiration, Incision and drainage.

1* Department of Surgery, International Medical Collage Hospital. Gushulia, Sataish. Gazipur, Email: rashnasharmin92@gmail.com Orcid id: https://orcid.org/0009-0007-3073-3837 [**Address of correspondence**]
2 Department of Surgery, Kushtia Medical College Hospital, Kushtia, Bangladesh.
3 Department of Surgery, Sir Salimullah Medical College Mitford Hospital. Dhaka, Bangladesh.
4 Department of Pathologyy, Medical College for Women and Hospital, Uttara, Dhaka.

INTRODUCTION

Breast abscess, although a common benign condition it requires urgent management[1]. It is a consequence of infectious mastitis that results in local accumulation of pus within the breast tissue and the patient presents with a painful swelling in the breast with other related symptoms such as fever, axillary lymphadenopathy etc. Due to increased stimulation by maternal hormones, it is more common in lactational period.

It is said that 0.4 to 11% of lactating women suffer from breast abscess in this subcontinent[1] and the incidence is mostly seen within first 6 weeks of lactation[2]. Moreover, it is mostly seen in primiparas, due to improper nursing technique by the inexperienced mother. The conventional treatment is incision followed by drainage under general anesthesia with broad spectrum antibiotic coverage [1-3].Though it is considered as gold standard procedure, it has some complications like, prolong healing time, regular painful dressing, difficulty in breast feeding, ugly scar formation, need for hospital admission, risk of exposure to general anesthesia, milk fistula, breast disfiguration, fear of incision etc. All these causes psychological pressure on an already stressed patient. Moreover, when a patient has to be hospitalized for few extra days, the recovery time is lengthened, patient is unable to carry her daily activities and the financial load is increased [4].

However, because of the risks, search for an alternative form of management that can be followed for treatment of smallabscess of breast is a demand of time. The ultrasound guided percutaneous needle aspiration offers minimal invasive, cost effective and bloodless procedure, which can avoid all the hazards of incision and drainage [4,5]. Additionally, this procedure offers less operative time and good cosmetic outcome[6].In a high-volume center like Sir SSMC Mitford Hospitalwhere reducing operating time may balance the number of daily procedure and also increases the number of services provided to the patients. Although there are lots of studies abroad, we do not have sufficient studies here regarding to comparison between the outcome and effectiveness of 2 methods of managing breast abscess that is by means of aspiration using needle percutaneously under the guidance of ultrasonography and incision followed by drainage of breast abscess that is done conventionally.If we can conduct this study, we can advocate the practice of needle aspiration percutaneously under ultrasound guidance for managing small abscess of the breast.

MATERIALS AND METHOD

Study participants

This Quasi Experimental research took placeat SSMC Hospital, Mitford, Dhaka in Surgery department from July 2023 to June 2024. Upon seeking the approval of the ethical review board of SSMC Mitford Hospital prior to the study, the ethical clearance was provided to carry out the research. A total 50 female patients with single and unilocular acute breast abscess sized ≤ 5cm on Ultrasonogram were selected. A statistical formula was used to calculate sample size based on published results by similar article. All the patients were admitted and evaluated by history, physical examination and investigation having similar protocol. After taking informed written consentpatients were divided into 2 groups (Group-A and Group-B). After that group-A (odd) patients were managed using needle aspiration percutaneously under guidance of ultrasonography and group-B (even) patients were managed by conventional incision and drainage. Patients presented with chronic or recurrent or multiple and multilocular breast abscess, with skin ulceration or necrosis, burst abscess, known tubercular breast abscess and granulomatous mastitis or any suspicion to breast malignancy, patients having, chronic disease of liver, uncontrolled diabetes mellitus,chronicrenal disorderwere excluded.

Procedure

Ultrasound guided percutaneous needle aspiration: Preceding to procedure, collection of sample of pus was drawn from abscess cavity by a 5cc syringe and sent for culture and sensitivity. Then while ensuring all precautions aseptically, the area was painted and 2% Lignocaine as local anesthesia was infiltrated onto the site. With the guidance of ultrasound, abscess cavity was localized. Then insertion of a 19 G needle was done into the cavity of the abscess from the area of normal using a 20 ml syringe skin and then aspiration was done. The process was repeated till all pus was aspirated. Adequacy of aspiration and complete evacuation of abscess cavity with no residual pus inside was aided by ultrasound. The pus volume was recorded. Sterile dressing was given. Patients were discharged with medications after procedure. If patients come with persistent features (pain, edema, swelling) with re accumulation of pus (confirmed by ultrasonogram) within the follow up period (up to 28 POD), re aspiration was done for second and third times as required. If there was no resolution with re accumulation of pus (volume same as or more than before) even after third aspiration, it was considered as treatment failure and then incision drainage was done.

Incision and Drainage:In the operation theater, with all aseptic precaution under general anesthesia, after painting and draping, sample of pus sample was taken from the abscess cavity by a 5cc syringe and sent for culture and sensitivity. The abscess was localized and then fixed with index finger and thumb. Incision was given over the most fluctuant area. All pus was evacuated. Hemostasis was ensured and a sample of tissue was taken from abscess wall for histopathological examination. The abscess cavity was washed with normal saline and hydrogen per oxide. Povidone iodine-soaked gauge pack kept in situ. Sterile dressing was given. After procedure patients were shifted to post operative ward with medications. Patients were advised for daily dressing until healing.

Sterile dressing was applied. Postoperatively, patients were shifted to the ward with appropriate medications and were advised for regular dressing until the wound healed.

After the procedure, all the patients were given antibiotics- Injection Amoxicillin-Clavulanic acid (1.2gm) I/V stat. Then Tablet Amoxicillin- Clavulanic acid (625mg) orally, three times daily, analgesic Ketorolac 10 mg three times daily and anti-ulcerant-Omeprazole 20 mg twice daily for 3 days were given. Antibiotic was changed/ continued according to the sensitivity report for 7 - 14 days.

All the patients were followed up on 3rd, 7th, 14th, 21st and 28th POD. Regular follow up was ensured and post-operative breast pain was assessed using Visual Analogue Scale, the extend of scar formation or any form of breast disfiguration, continuation of lactation (in case of lactating mothers), frequency of hospital visits and the time required for complete resolution were observed. All the information was recorded in a structured data collection sheet.Patients who needed aspiration for more than three times (with pus volume same as or more than before) was considered as treatment failure and in that case incision and drainage was considered.

Statistical analysis

Data were expressed as frequency, percentage, mean ± SD and presented in appropriate tables and figures.Chi Square test and Independent sample t test were performed as applicable. Significance level was taken at p value <0.05. Statistical analyses were performed by using IBM SPSS Statistics for Windows version 26.0.

RESULTS

In this study, age of the study subjects was 23.40±6.46 years and 24.44±6.93 years in both group A and B. Among them 28% and 48% patients were lactating mother in both groups (Table -1). Ultrasonographical examination showed breast abscess was 0-1.9 cm in 12% and 16% patients, 2-2.9cm in 24% and 28%, 3-3.9 cm in 28% and 36% and 4-5cm in 36% and 20% patients of the both groups respectively (Table-2). The time needed for the procedure was significantly (p<0.001) less in A group than B. Pain was significantly (p<0.001) less in A group than B. We observed that all lactating women continued their breastfeeding from the day of aspiration (0.00±0.00 Post Operative Day) but women lactation was continued 12.33±2.32 Post Operation Day (POD) in B group. Frequency of hospital attend was significantly (p<0.001) less in A group than B. In aspiration group, Abscess was resolute on a single aspiration in 9 (36%) patients, while 10 (40%) patients required double aspirations, 2 (8%) patients needed thrice and 4 (16%) patients were not resolved even after more than three and hence were treated by Incision and Drainage. Complete resolution time was significantly (p<0.001) less in A group than B. Four treatment failure patients are not included in Table-3. We experienced that every patient had satisfactory cosmesis after aspiration and everyone developed scar mark after incision and drainage (Figure-1).

Table 1: Characteristics of the study subjects (N=50)

Variable	Group A (n=25)	Group B (n=25)	*p* value
Age (Years) Mean±SD	23.40±6.46	24.44±6.93	0.760 *
Lactating status			
Yes	7 (28%)	12 (48%)	
No	18 (72%)	13 (52%)	0.145†

* Unpaired t test and †Chi Square test were performed. N=Total number of patients; n=number of patients in each group

Table 2: Distribution of study subjects according to size of the abscess (N=50)

Size of abscess (cm)	Group A (n=25)	Group B (n=25)	*p* value
0-1.9	3 (12%)	4 (16%)	
2-2.9	6 (24%)	7 (28%)	
3-3.9	7 (28%)	9 (36%)	0.656
4-5	9 (36%)	5 (20%)	

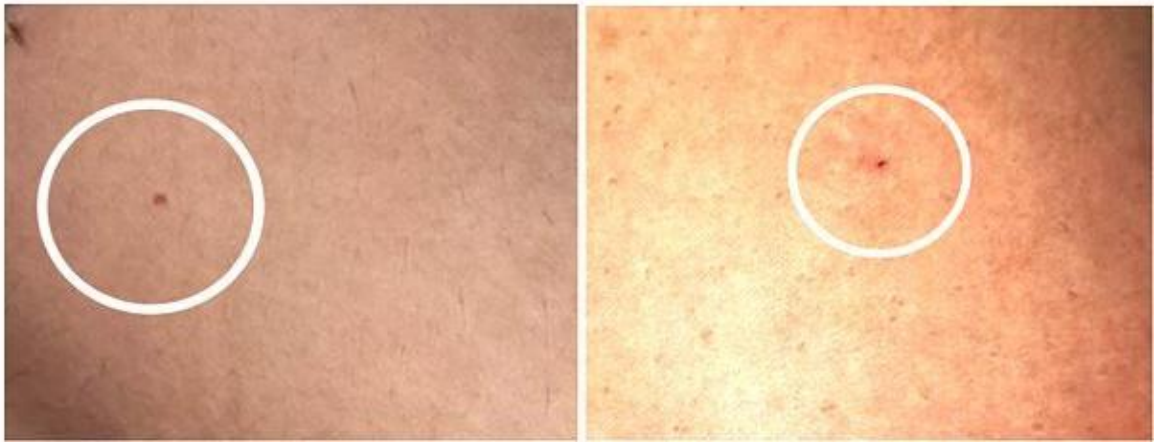
Chi Square test was performed. N=Total number of patients; n=number of patients in each group

Table 3: Comparison of surgical outcome of the study subjects (N=50)

Variables	Group A (n=25)	Group B (n=25)	p value
Duration of procedure (min)	15.64±3.33	31.48±7.05	<0.001
Visual analogue scale (VAS) score	2.72 ± 1.28	5.28 ± 1.28	<0.001
Continuation of breastfeeding (POD)	0.00±0.00	12.33±2.32	<0.001
No of visit (Times)	4.88±2.35	12.96±3.88	<0.001
Number of Aspiration			
One	9 (36%)		
Two	10 (40%)		
Three	2 (8%)		
Failure	4 (16%)		
Duration of complete resolution	14.48±3.73	24.60±3.92	<0.001

Independent Sample t test was performed. N=Total number of patients;n=number of patients in each group

Figure 1: Pictogram showing postoperative cosmesis of the study subjects (N=50)



Group A: Aspiration puncture mark after ultrasound guided needle aspiration (Courtesy- SSMC)

Group B: Scar mark formation after incision and drainage (Courtesy- SSMC)

DISCUSSION

Breast abscess is a clinical entity identified in daily practice. At an initial presentation it may be treated conservatively with antibiotics. When an abscess is formed, incision followed by drainage is the choice of treatment. Numerous studies informed that incision and drainage of a breast abscess is associated with a requirement for daily dressing, extended healing time, patient uneasiness regarding continuing breastfeeding, an unsatisfactory cosmesis and chance of recurrence. Ultrasound guided needle aspiration has become the modern management protocol in many centers due to its ease and outcome. Contemporary study was to undertaken to compare the outcome and effectiveness of needle aspiration percutaneously under the guidance of ultrasound versus conventional incision followed by drainage in management of small abscess of breast [6, 7].

In existing study, age of the participants were 23.40±6.46 years and 24.44±6.93 years in both of thegroups. About 28% and 48% mothers were lactating in both groups respectively. Chorma et al.[7] and Totadri et al.[8] agreed with our study.

In terms of procedure time, aspiration was observed to be quicker compared to the conventional method of management. The latter procedure required general anesthesia in the operation theater, resulting in additional time for

preoperative preparation and postoperative recovery fromanesthesia. Voruganti et al. and Rajkumar et al., also found parallel findings [2,5]. Pain after both procedures were assessed by VAS score and the score was significantly less (2.72 ± 1.28 Vs 5.28 ± 1.28) in aspiration group than incision and drainage group. Chorma et al. [7] and Noor et al.[9] were agreed our findings.

Tran et al.[10] reported that most of the patients resolved after 1–3 aspirations. About 42.7% patients needed one aspiration and only 2.7% patients required five aspirations for complete resolution. We also observed similar findings but in16% of the participants the abscess of breast were not healed even after 3 aspirations and so were managed by incision followed by drainage in our series.

Our study revealed that all lactating women continued their breastfeeding from the day of aspiration (0.00±0.00 POD) in aspiration group than women who underwent incision and drainage (12.33±2.32). Bhatti et al.[11] informed that recommencement of uninterrupted breastfeeding after procedure was present in 96.3% of patients who underwent aspiration, while almost all of the patients underwent incision and drainage could not recommence uninterrupted breastfeeding. Tran et al.[10] stated that 88.5% of patients continued breastfeeding after treatment and 11.5% stopped breastfeeding.

In current study, mean number of hospital visits was significantly (p<0.001) less in aspiration group (4.88±2.35 times) than incision and drainage group (12.96±3.88 times). We found that 16% patients had treatment failure in aspiration group and went through incision and drainage. Their follow up schedule was like incision and drainage group. A parallel study was conducted by Voruganti et al.[2] found similar findings. This is due to requirement of regular dressings.

In existing study reported that complete resolution time was significantly (p<0.001) less in aspiration group (14.48±3.73 days) as compared to incision and drainage group (24.60±3.92 days). Chorma et al.[7] performed similar findings but Saeed et al.[12] disagreed with our studies. We observed that after complete resolution, all patients had satisfactory cosmesis after aspiration. All patients developed scar mark after incision and drainage. Chorma et al.[7] reported that 2.5% patients had chances of scar formation after ultrasound guided aspiration. Fathy et al.[13] informed that after complete resolution, all patients were satisfied in aspiration group and 46% patients had developed scar mark after incision and drainage.

CONCLUSION

After analyzing the results of present study, it was noted that needle aspiration percutaneously under the guidance of ultrasound demonstratesa promising success rate with early healing, less post operative pain, uninterrupted breast feeding, low failure rate and satisfactory cosmesis as compared to incision and drainage. By limiting the length of hospital stay and minimizing the frequency of visits, it also helps decrease the financial burden on patients. These advantages suggest that ultrasound-guided percutaneous needle aspiration is asimple, safe, effective, reasonable, and widely acceptable procedure for managing smallbreast abscesses. However, additional prospective and multicenter studies with larger sample sizes are required to validate and strengthen these findings, ensuring its broader adoptionin clinical practice.

LIMITATIONS

Small sample size and this single hospital-based study did not reflect exact scenario of the whole community.

ACKNOWLEDGEMENT

The authors acknowledge Surgery Department, Sir Salimullah Medical College Hospital Mitford, Dhaka for their kind cooperation during sample collections and all the study subjects for their active participation.

CONFLICT OF INTEREST

There is no conflict of interest.

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