

## Original Article

### COMPARISON BETWEEN ASPIRATION AND INCISION AND DRAINAGE OF BREAST ABSCESS

Md. Fardhus<sup>1</sup>, AMSM Sharfuzzaman<sup>2</sup>, Md. Nayeem Dewan<sup>3</sup>,  
Dipak Chandra Kirttania<sup>4</sup>, Ahmed Sami-Al-Hasan<sup>5</sup>, Joy Zakharia Rab<sup>6</sup>

#### Abstract

**Background:** Breast abscess is defined as an acute inflammatory lump which yields pus on incision/aspiration. The frequency of occurrence is highly related to pregnancy and caused due to nipple cracking by a child during breast feeding and bacterial colonization due to improper nursing technique and incomplete emptying of the breast.

**Objective:** The present study compares the outcome and effectiveness of traditional treatment incision and drainage against needle aspiration in the treatment of breast abscess.

**Methods:** This is a comparative study carried out in department of general surgery, Sher-E-Bangla Medical College Hospital, Barisal between January 2014 and December 2014. 50 female patients of age between 20-40 years and diagnosed breast abscess with abscess size of  $\leq 7$  cm in diameter on ultrasonography were included in the study after taking written consent form. Of these 25 had undergone aspiration of the breast abscess (group A) and 25 had undergone incision and drainage (group B).

**Results:** The mean age of the female patients in group A was 23.42 years and in Group B was 23.31. 91% of the cases were lactating. *S. aureus* was the common organism isolated in both lactating and non-lactating cases, encountered in 27 patients (54%). Out of that were in the aspirated group 17 patients (56.67%). 10 patients were in the incised group (33.33%). The mean healing time and cosmetic outcome was significantly ( $p = 0.001$ ) very good in patients treated with needle aspiration compared to incision and drainage. There was no recurrence of breast abscess observed in needle aspiration group during the study. There was 3.3% recurrence rate observed in the incision and drainage group.

**Conclusion:** Breast abscess in patients with diameter of  $\leq 7$  cm can be treated with needle aspiration successfully and with a good cosmetic outcome.

**Key words:** Needle aspiration, Incision and drainage, Breast abscess

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| 1. Assistant Professor, Department of Surgery, Patuakhali Medical College, Patuakhali.         | 5. Junior Consultant (Surgery), Kurmitola General Hospital, Dhaka.  |
| 2. Professor and Head, Department of Surgery, Sher-E-Bangla Medical College Hospital, Barisal. | 6. Registrar, Department of Surgery, Sher-E-Bangla Medical College Hospital, Barisal.   |
| 3. Curator (Anatomy), National Institute of Cardiovascular Diseases (NICVD), Dhaka.            | <b>Correspondence to:</b> Dr. Md. Fardhus, Assistant Professor, Department of Surgery, Patuakhali Medical College, Patuakhali. Cell: +8801716330737 |
| 4. Assistant Professor, Department of Surgery, Patuakhali Medical College, Patuakhali.         | E-mail: drfardhus@gmail.com   |

### Introduction

Breast abscess is one of the commonest form of surgical emergencies usually seen in lactating woman<sup>1</sup>. The frequency of occurrence is highly related to pregnancy and mainly caused due to nipple cracking by a child during feeding and bacterial colonization due to improper nursing technique and incomplete emptying of the breast<sup>2</sup>. Immediate diagnosis and treatment is necessary if breast feeding is to be continued and for the prevention of further complications. At an early stage, acute mastitis may be treated by the use of appropriate antibiotics. Once an abscess is established, management involves incision and drainage under general anesthesia which is followed by regular dressing, prolonged healing time, difficulty in breast feeding, possible unsatisfactory cosmetic outcome, rupture and recurrent breast abscess<sup>3</sup>. Hence now-a-days treatment of breast abscess by repeated needle aspiration with or without ultrasound guidance gained importance<sup>4</sup>. This procedure has been used successfully and is associated with less recurrence, excellent cosmetic result and has less costs<sup>5</sup>.

This study was aimed to compare the outcome and effectiveness of traditional treatment incision and drainage against needle aspiration in the treatment of breast abscess in terms of time required for the procedure, duration of hospital stay, healing time, cosmetic outcome and postoperative pain.

### Materials and Methods

A comparative study was carried out in department of general surgery, Sher-E-Bangla Medical College Hospital, Barisal from January 2014 to December 2014. Data was collected from all patients attending the surgery department with pain and swelling over the breast within a defined study period. 50 female patients of age between 20-40 years and diagnosed breast abscess with abscess size of  $\leq 7$  cm in diameter on ultrasonography were included in the study after taking written consent form. Of these 25 had undergone aspiration of the breast abscess (group A) and 25 had undergone incision and drainage (group B).

Exclusion criteria were patients of age  $<20$  or  $>40$  years, suspicious lesions/malignancy esp. inflammatory carcinoma of breast, immunocompromised, recurrent breast abscess, ruptured abscess, tuberculosis and complicated breast abscess presenting with skin changes, ulceration, necrosis and gangrenous abscess.

The patients were diagnosed clinically for duration, site, nature and past history of abscess. General examination including pulse rate, blood pressure and body temperature were recorded. Detailed examination of breasts was carried including increased temperature, tenderness, and discharge from the nipple, fluctuation and axillary lymphadenopathy. Blood investigation for total leucocyte count was made.

### Needle aspiration

An 18 G needle and a 20 ml syringe were used in each case. The breast was stabilized with the index finger and the thumb. The abscess was localized and needle was inserted in to the abscess from the area of normal skin without using any anesthesia. Abscess was aspirated and the syringe was detached, pus aspirated was sent for culture and antibiotic sensitivity. Another syringe or the same syringe was again attached to the needle, which was placed in the abscess. Similar procedure was carried out until no pus was aspirated. Aspiration was repeated every alternate day if required until the mass had completely resolved or until three needle aspirations had been performed.

### Incision and drainage

The abscess was localized and incised near the areolar margin and along skin lines under general anesthesia. All pus was evacuated, and loculi were broken down digitally or by using the sinus forceps. The pus drained was sent for culture sensitivity. The wounds were left open to drain and dressed on alternate day until the wound was clean and granulated.

### Statistical analysis

Descriptive statistics were used in the study. Mean age of the patient, mean duration of pain and fever, volume of pus aspirated or drained, mean operation time, duration of stay, healing time between the groups were analyzed by using the Student's t-test. Distribution of lactation and non-lactational women, mean parity among groups, presence of axillary lymphadenopathy and cracked nipple, USG size comparisons, culture sensitivity, postoperative pain and fever and cosmetic outcomes between the groups were analyzed by Chi square test. P value  $<0.05$  were taken as significant.

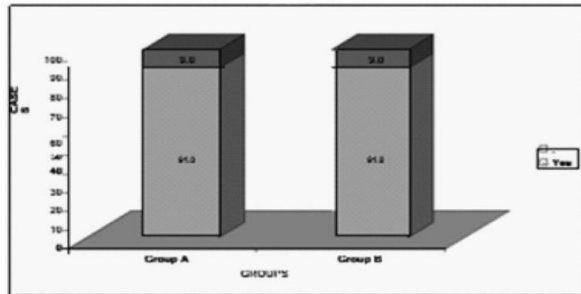
**Results:** Site of the breast abscess was divided in to four peripheral quadrants and sub areolar on either side. Distribution of breast abscess was more on the left side 28 (56%) than on the right side 22 (44%). We observed that left upper and outer quadrant abscesses were most common (40%) among all the abscesses. Patients were primipara in most cases (66.7% in Group A and 56.7 % in Group B).

**Table 1:** Age distribution of breast abscess (n=50)

Age (years)	No. of Patients	%
20-24	32	64
25-29	11	22
30-34	4	8
35 $\geq$	3	6



**Figure I :** Association of lactating and non-lactating between two groups (n=50)



**Figure II** Mean duration of postoperative pain between the groups (n=50)

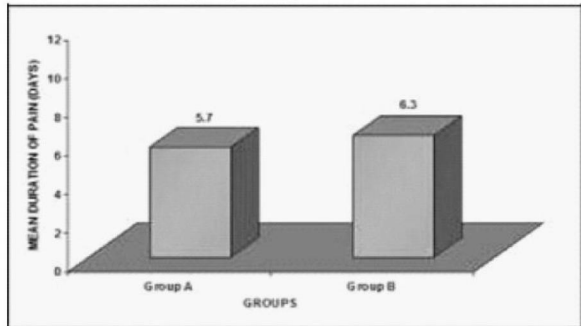


Figure II shows that mean duration of postoperative pain was 5.7 days among group A; which was less than group B (6.30 days), but the difference was not significant ( $p = 0.25$ ).

**Figure III** Mean duration of fever between two groups

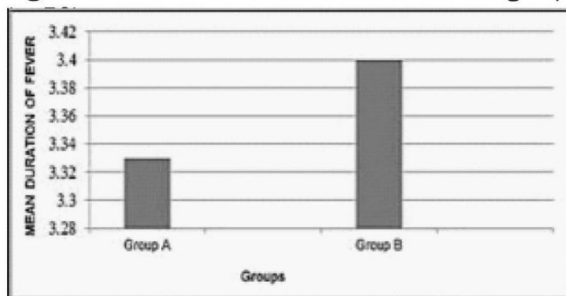


Figure III shows that Fever was observed totally in 21 patients (42%). In aspirated group, fever was complained in 12 patients (48%). The mean duration of fever was 3.3 days. In the incised group, fever was complained in 9 patients (36%) i.e., 3.4 days and this difference between two groups was not significant ( $p = 0.838$ ).

**Table 2:** Comparison of clinical signs between two groups (n=50)

Symptoms	Group A		Group B	
	Nb	%	No	%
Axillary lymphadenopathy	Yes	06 24	4	16
	No	19 76	21	84
Cracked nipples	Yes	8 32	07	28
	No	17 68	18	72

**Table 3:** Comparison of culture-sensitivity between two groups (n=50)

Culture - sensitivity	Group A		Group B	
	No	%	No	%
S. aureus	17	56.67	10	33.33
S. pyogenes	-	-	03	10
No growth	8	32	12	48

**Table 4:** Comparison of time taken for procedure and duration of stay in hospital between groups (n=50)

Groups	Mean time taken for procedure (min)	Mean duration of their stay in hospital (in days)
Group A	6.62±01.5	0.2±0.48
Group B	18.81±02.10	2±0.42

**Table 5:** Comparison of proportion of cases with postoperative pain between two groups (n=50)

Pain (rating)	Group A (N = 25)					Group B (N = 25)				
	Day 0	Day 2	Day 4	Day 6	Day 10	Day 0	Day 2	Day 4	Day 6	Day 10
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
No	- (-)	- (-)	04 (16%)	13 (52%)	24 (96%)	- (-)	- (-)	2 (8%)	7 (28%)	23 (92%)
Mild	- (-)	08 (32%)	13 (52%)	10 (40%)	01 (4%)	05 (20%)	5 (20%)	9 (36%)	11 (44%)	2 (8%)
Moderate	13 (52%)	12 (48%)	8 (32%)	02 (8%)	- (-)	10 (40%)	11 (44%)	9 (36%)	6 (24%)	- (-)
Severe	12 (48%)	05 (20.0)	- (-)	- (-)	- (-)	10 (40%)	09 (36%)	5 (20%)	1 (4%)	- (-)

Table 5 shows that Post operative pain was calculated according to numeric rating scale. On the day of presentation taken as day 0 and every alternate day as day 2, day 4, day 6 till day 10 or abscess healed, whichever is earlier and followed up later till 3 months. Difference between two groups were found significant ( $p < 0.05$ ).

**Table 6:** Mean diameter of abscess and pus volume aspirated during treatment in group A (n=50)

No. of aspirations	No. of patients (N = 25)	% of total aspirated	Mean abscess diameter in cm	Mean pus volume in ml
Aspiration1	12	48	07	85.33 ±48.01
Aspiration2	07	28	05.30 ± 01.62	70.37 ± 28.19
Aspiration3	03	12	04.10± 48.01	35.50 ± 17.12
Failure	03	12	05.4 ± 120	75.50± 5.00

**Figure IV:** Comparison of mean healing time between two groups (n=50)

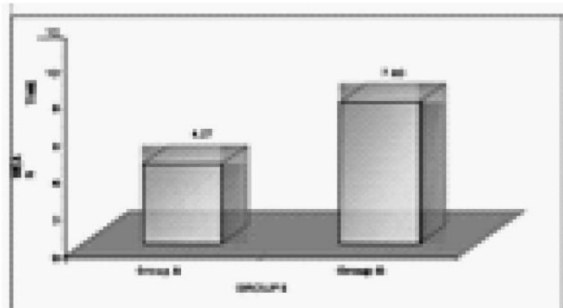


Figure IV shows that the mean healing time was 4.27 among group A that was significantly less as compared to 7.60 among group B.

**Table 6:** Comparison of Cosmetic outcome between two groups (n=50)

Outcome	Group A (n=25)	Group B (n=25)
Scar	3 (12%)	25 (100%)
No Scar	22 (88%)	0

Difference between the groups were significant with each other (p =0.001).

**Discussion**

In our comparative study, we compared two groups, aspiration and incision-drainage of the breast abscess in the management of it without control group. In the current report, patients age range has some similarity with the result of Dixon et al and Dener et al, who demonstrated that breast abscesses most commonly affects women aged 18-50 years<sup>4,6</sup>. Although breast abscess generally has been associated with mastitis and breast feeding, the results of our study and others indicate that abscess was also found in non-lactating women Crowe et al and Scholefield et al<sup>7,8</sup>.

In our study 61.45% patients were primi and 38.55% were multiparae, a similar incidence has been described by Dener et al<sup>4</sup>. This is similar to the literature, which describes primiparous women to be at a greater risk for the development of breast abscess during lactation than multiparous women<sup>9</sup>.

Breast abscess is frequently located in the upper and outer quadrant, which fits with the fact that most of

the breast parenchyma is located in this quadrant. In our study, 70% of breast abscess was found in the upper and outer quadrant and 56% of breast abscess was located in the left breast. This is in agreement with Eryilmaz et al and Chandika et al reported a similar incidence of breast abscess over left side and abscess in the upper and outer quadrant<sup>10,11</sup>. In our study finding of peripherally located abscess more than centrally locating was consistent with the results of Hamid et al<sup>12</sup>.

In this study all the patients in both groups presented with pain as a general feature. The mean duration of pain in our study was 6.3 days in Group B & 5.7 days in Group A. However the incidence of fever was in 21 patients (42%), axillary lymphadenopathy was present in 15 patients (60%) of the total and cracked nipple was present in 15 patients (60%). These observations are similar with the findings of Dener et al<sup>4</sup>.

In our study the culture-sensitivity reveals the presence of *S. aureus* and *S. pyogenes*. We have 27 (90%) patients who had *S. aureus* positive reports; of which 17 (56.67%) patients were in aspirated group and 10 (33.33%) patients in the incised group. *S. pyogenes* which was present in only 3 (10%) patients and those were in the incised group. Similar finding has been reported by Singh et al and Elagili et al<sup>13,14</sup>. The findings of mixed flora with anaerobes in non-lactational breast abscess, similar to findings of Walker et al<sup>15</sup>.

The mean time required for both the procedures was assessed. From the results it was observed that patients undergoing aspiration required 6.62± 1.5 minutes which was significantly less as compared to the mean time required for the procedure for patients undergoing incision and drainage, which was 18.81 ± 2.10 minutes confirming that needle aspiration is very feasible, simple procedure and can be performed without any imaging guidance and anesthesia.

In the present study, the mean diameter of the abscess was 5.7 cm in total patients. The mean volume of pus aspirated in aspirated group was 66.25 ml and that in the incised group was 69.50 ml. There was no significant difference in the mean amount of pus aspirated or drained in these two groups. These results were in contrast with the studies of Hamid et al<sup>12</sup>.



In our study of the 25 patients who underwent aspiration, 22 were treated successfully without any complication on follow up. The success rate achieved was 88%. This was comparable with the study conducted by O'Hara et al reported an 86% cure rate<sup>16</sup>.

In this study aspiration failure was found in 12% (3 patients). Incidence similar to our study was reported by O'Hara et al<sup>16</sup>. In the incised group only one patient failed (2%). There was no recurrence of breast abscess observed in needle aspiration group during the study. However the recurrence rate was far less than 31% in the incision and drainage group, (3.3%) which has been reported by Strauss et al<sup>17</sup>. This small recurrence rate observed may have resulted from a short follow up period.

In our study all the patient's undergone ultrasonography to assess the size and location of breast abscess and to confirm the diagnosis of breast abscess, though it was diagnosed clinically. Ultrasonography was also useful tool in diagnosis of breast abscess as found in study done by Dener et al<sup>4</sup>.

Post operatively clinical symptoms like pain and fever were assessed in the patients of breast abscess treated with aspiration and with incision and drainage. At the end of day 10, we observed 96% of the patients in aspirated group got relief from pain whereas in the incised group 92% of the cases had no pain and the difference was not found to be significant. Wound healing was significantly faster in the aspirated group than in the incised group (4.27 days versus 7.60 days), this finding was similar to the study done by Eryilmaz et al<sup>10</sup>.

### Conclusion

The observation of our study shows that needle aspiration of the abscess with ultrasonographic guidance combined with antibiotics has a great value in the treatment of breast abscess even in abscess with large volume; although repeated aspiration are needed to obtain complete resolution, this therapy is a well-accepted alternative to surgical treatment. Aspiration of the breast abscess through a wide bore cannula is thus a feasible and easy procedure, but may require multiple aspirations for cure. It does not require any mode of anesthesia and can be done even on out-patient department basis. Breast abscess in selected group of patients with diameter of  $\leq 7$  cm can be treated by aspiration successfully and with a good cosmetic outcome. Aspiration of the breast abscess can be successfully done as initial mode of management in the treatment, but incision and drainage remains the final resort for cure.

### References

1. Altomare DF, Rinaldi M, Sallustio PL et al Long 1. Martin JG. Breast abscess in lactation. *Journal of midwifery and women's health*. 2009;54(2):150-1.

2. Leibman AJ, Misra M, Castaldi M. Breast abscess after nipple piercing: sonographic findings with clinical correlation. *Journal of ultrasound in medicine. Official journal of the American Institute of Ultrasound in Medicine*. 2011;30(9):1303-8.
3. Benson EA. Management of breast abscesses. *World J Surg*. 1989;13:753-6.
4. Dener C, Inan A. Breast abscesses in lactating women. *World J Surg*. 2003;27:130-3.
5. Srauss A, Middendorf K, Müller-Egloff S, Heer IM, Untch M, Bauerfeind I. Sonographically guided percutaneous needle aspiration of breast abscesses-a minimal invasive alternative to surgical incision. *Ultraschall Med*. 2003;24(6):393-8.
6. Dixon JM. Repeated aspiration of breast abscesses in lactating women. *BMJ (Clinical research ed)*. 1988;297(6662):1517-8.
7. Crowe DJ, Helvie MA, Wilson TE. Breast infection. Mammographic and sonographic findings with clinical correlation. *Investigative radiology*. 1995; 30(10): 582 -7.
8. Scholefield JH, Duncan JL, Rogers K. Review of a hospital experience of breast abscesses. *The British journal of surgery*. 1987;74(6):469-70.
9. Kvist LJ, Rydhstroem H. Factors related to breast abscess after delivery: a population? based study. *BJOG: An International Journal of Obstetrics and Gynaecology*. 2005;112(8):1070-4.
10. Eryilmaz R, Sahin M, Hakan Tekelioglu M, Daldal E. Management of lactational breast abscesses. *Breast (Edinburgh, Scotland)*. 2005;14(5):375-9.
11. Chandika AB, Gakwaya AM, Kiguli-Malwadde E, Chalya PL. Ultrasound guided needle aspiration versus surgical drainage in the management of breast abscesses: a Ugandan experience. *BMC research notes*. 2012;5:12.
12. Hamid HS, Osama MI. Percutaneous Needle Aspiration Is A Minimally Invasive Method For A Breast Abscess. *Arch Clin Exp Surg*. 2012;1(2):105-9.
13. Singh G, Singh G, Singh LR, Singh R, Singh S, Sharma KL. Management of breast abscess by repeated aspiration and antibiotics. *Journal of Medical Society*. 2012;26(3):189.
14. Elagili F, Abdullah N, Fong L, Pei T. Aspiration of breast abscess under ultrasound guidance: outcome obtained and factors affecting success. *Asian journal of surgery/Asian Surgical Association*. 2007;30(1):40-4.
15. Walker AP, Edmiston CE Jr, Krepel CJ, Condon RE. A prospective study of the microflora of nonpuerperal breast abscess. *Archives of surgery*. 1988;123(7):908-11.
16. O'Hara RJ, Dexter SP, Fox JN. Conservative management of infective mastitis and breast abscesses after ultrasonographic assessment. *The British journal of surgery*. 1996;83(10):1413-4.
17. Strauss A, Middendorf K, Muller-Egloff S, Heer IM, Untch M, Bauerfeind I. Sonographically guided percutaneous needle aspiration of breast abscesses a minimal-invasive alternative to surgical incision. *Ultraschall in der Medizin*. 2003;24(6):393-8.