

Original Research Article

## A STUDY ON TREATMENT OF BREAST ABSCESS: USG GUIDED VS INCISION AND DRAINAGE

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### ABSTRACT

**Background:** The traditional treatment for breast abscess consists of incision and drainage of pus along with anti-staphylococcal antibiotics. However, this method is associated with a increase time to heal, regular dressings, difficulty in breastfeeding difficulties, and the occurrence of milk fistula.

**Aim and Objective:** To compare the different procedure used for the treatment of breast abscess.

**Material and Methods:** The present study was conducted among the women with breast abscess to assess the clinical outcomes and adverse events between the traditional Incision & Drainage therapy and the USG guided aspiration of the abscess, at the surgical department of a tertiary care Institute in Pune, Maharashtra, India. In the present study, we recruited 25 patients in I & D group and 25 patients in USG guided group.

**Results:** The mean age of the patients in I & D group was 36.2±10.1 years and in USG guided group it was 40.2±14.2 years. Out of 25 patients, 7 (28.0%) had co-morbidities in I& D group and in USG guided group, 14 (56%) had co-morbidity . In I&D group, 18 (72%) patients were lactating. In USG guided group, 13 (52%) were lactating. The mean±SD post-operative stay of the patients in I&

D group was  $5.5 \pm 1.4$  days and  $2.4 \pm 1.2$  days in USG guided group ( $p < 0.001$ ). In I & D group, 2 (8.0%) required a repeat procedure. In USG guided group, 10 (40%) required repeat procedure ( $p = 0.012$ ). In USG guided group, 3 (12%) underwent I&D as repeat procedure and 7 (28%) underwent USG guided repeat procedure. In I & D group, all the 25 patients had a scar of 100%. In USG guided group, 7 (28%) had a scar and 18 (72%) did not have a scar ( $p < 0.001$ ). In I& D group, 2 (8%) had recurrence and the remaining 23 (92%) did not have any complications. In USG guided group, out of 25, 10 (40%) had recurrence, one patient (4%) had granuloma and the remaining 14 (56%) did not have any complications ( $p = 0.014$ ). In I & D group, 17 (68%) had moderate / severe grade of pain (4-6), 7 (28%) of patients had pain of 7-9 with very severe grade and 1 (4%) had mild pain of 1-3 grade. In USG group, 14 (56%) had mild pain of 1-3 grade, 10 (40%) had pain of moderate or severe grade and 1 (4%) had a pain of very severe grade ( $p < 0.001$ ). In I & D group, *S. aureus* was the reported in 11 (44%) of the patients, MRSA was seen in 6 (24%) of the patients, *Streptococcus aeruginosa* was seen in 4 (16%). In USG guided group, 8 (32%) patients had *S. aureus*, 6 (24%) patients had MRSA, 5 (20%) had mycobacterium and 2 (8%) had *Streptococcus aeruginosa*.

**Conclusion:** Present study concluded that USG guided aspiration of breast abscess significantly reduced the post-procedure hospital stay, scar incidence and pain than the conventional surgical management by the incision and drainage.

**Keywords:** Breast Abscess: USG Guided, Incision, Drainage

## INTRODUCTION

The traditional treatment for breast abscess consists of incision and drainage of pus along with anti-staphylococcal antibiotics. However, this method is associated with a increases time to heal, regular dressings, difficulty in breastfeeding difficulties, and the occurrence of milk fistula. Recent research has shown that breast abscesses are treatable with a combination of repeated needle aspirations and vacuum drainage. Mastitis is a common condition that predominates during the puerperium. Breast abscess continues to be a major cause of morbidity in developing countries. The treatment of breast abscess continues to be a challenge. Traditionally, treatment of breast abscess involved incision and drainage which is done under general anaesthesia following which the patient requires frequent dressing, will have unsightly scar formation and lactating mothers tend to avoid breast feeding after treatment. With this continuously tried method of incision and drainage, the recurrence rate is still high.

A breast abscess is a localized collection of purulent material within the breast<sup>1</sup>, which can be a complication of mastitis. Breast abscesses most commonly affect women aged between 18 and 50 years. In women of reproductive age these are predominantly lactational but non-lactational abscesses are also seen in premenopausal older woman. Breast abscesses are occasionally noted in neonates.<sup>2</sup> Non-lactational abscesses are more common in obese patients and smokers than in the general population.<sup>3</sup> In the United Kingdom (UK) these patients may be reviewed in a variety of healthcare settings including general practice, Accident and Emergency (A&E) or in surgical clinics. Early referrals are essential to prevent evolution into severe infection and even sepsis. There has been a lack of consensus in the past regarding appropriate management pathways and delays in treatment has resulted in worse outcomes.<sup>4</sup> Treatment regimens generally include antibiotics; and for breast abscesses - percutaneous drainage and/or surgical I&D. As effective ultrasound-guided drainage becomes more commonplace, this has begun to circumvent the need for invasive I&D, even for large abscesses. The predominance of *Staphylococcus aureus* allows a rational choice of antibiotic without having to wait for the results of bacteriological culture. Relatively few

randomized-control-trials have been carried out to evaluate the treatment rationale; hence, management and guideline design requires a review of available evidence.

Therefore, keeping in view the above mentioned facts, the present study was carried out to compare the different procedure used for the treatment of breast abscess.

## **METHOD AND MATERIALS**

The present prospective study done from September 2020 to April 2022. All the patients in the outpatient department of Dr. D Y Patil hospital and medical college, Pune, who were primarily diagnosed with breast abscess were taken into study population. Study group of 50 patients is set with clinical features suggesting of breast abscess (fever, pain, swelling, redness of breast associated with localized tenderness) and who gave consent was recorded. The diagnosis was confirmed by ultrasound evidence of liquefaction with long axis diameter or consideration of size. The patients would undergo either invasive procedure for the drainage of breast abscess or conservative treatment according to the size and presentation of the abscess. Pus culture and sensitivity would be send to find out the organism involved in the breast abscess.

Patient would undergo USG to evaluate the size of the breast abscess according to which the treatment modality would be decided (i) if the size of the abscess is small which cannot be aspirated such abscess would be managed with conservative management with antibiotic and local application of heat (ii) Patients with abscess <5 cc, would undergo percutaneous needle aspiration as an outpatient basis using 16 -18 gauge needle attached with 20 cc syringe. All the patients were encouraged for breast feeding. Further aspirations if needed were done at an interval of 5-7 days till the resolution of signs and symptoms. There are two end points in the management, when no further pus is aspirated and confirmation of absence of residual abscess by ultrasound done after 2-3 days after 1<sup>st</sup> endpoint. A total of 7 days of antibiotics were given to all patients. Patients are encouraged for breast feeding from both the sides. (iii) Patients with abscess >5 cc underwent open surgical drainage under general anaesthesia as an inpatient basis. Injection Amoxicillin + clavulanic acid was given to the patient on the day of surgery and shifted to oral medication on discharge.

All the patients stayed for 1 day in the hospital. Daily dressing with packing gauze was done till the resolution of sign and symptoms and complete healing of wound as end point of management. Antibiotic was given for 7 days to all the patients. All patients were encouraged for breast feeding from opposite side with expression of milk on the same side. Pain is a subjective phenomenon. There are no biochemical parameters for measurement of pain. Pain was measured by Visual Pain Analog Scale (VAS). The number of analgesics required by the patient during the course of the treatment was taken into account.

## **STATISTICAL ANALYSIS**

In the end, the data was collected and analysed statistically by using Chi-square test. A p value of <0.05 was considered as significant. SPSS ver. 20.0 was used for statistical analysis.

## **RESULTS**

In the present study, we recruited 25 patients in I & D group and 25 patients in USG guided group. The mean±SD age of the patients in I & D group was 36.2±10.1 years and USG guided group was 40.2±14.2 years (p >0.05, NS). A total of 7 (28.0%) had any co-morbidity in I&D group and 18 (72%) did not have any co-morbidity. In USG guided group, 14 (56%) had co-morbidity and 11 (44%) did not have any co-morbid condition.

In I & D group, 18 (72%) were lactating and 7 (28%) were not. In USG guided group, out of 25, 13 (52%) were lactating and the remaining 12 (48%) were not lactating ( $p=0.145$ ). The mean $\pm$ SD post-operative stay of the patients in I& D group was  $5.5\pm 1.4$  days and  $2.4\pm 1.2$  days in USG guided group ( $p<0.001$ ).

In I & D group, 2 (8.0%) patients required a repeat procedure and 23 (92.0%) did not require repeat procedure. In USG guided group, 10 (40%) required repeat procedure and 15 (60%) did not require. There was significant difference in the requirement of repeat procedure between the groups ( $p=0.012$ ). In USG guided group, 3 (12%) underwent I&D as repeat procedure and 7 (28%) underwent USG guided repeat procedure.

In I & D group, all the 25 patients had a scar of 100%. In USG guided group, 7 (28%) had a scar and 18 (72%) did not have a scar ( $p<0.001$ ).

Various complications observed during the study period is shown in Table 1.

**Table 1: Complications**

Complications	I & D		USG guided	
	n	%	n	%
Recurrence	2	8.0	10	40.0
Granuloma	0		1	4.0
None	23	92.0	14	56.0
Total	25	100.0	25	100.0
Chi square p value=0.014 (Significant)				

In I& D group, out of 25 patients, 2 (8%) had recurrence and the remaining 23 (92%) did not have any complications. In ISG guided group, out of 25, 10 (40%) had recurrence, one patient (4%) had granuloma and the remaining 14(56%) did not have any complications ( $p=0.014$ ).

**Table 2: Pain**

Pain	I & D		USG guided	
	n	%	n	%
1-3 (Mild)	1	4.0	14	56.0
4-6 (moderate/severe)	17	68.0	10	40.0
7-9 (very severe)	7	28.0	1	4.0
Total	25	100.0	25	100.0
Chi square p value=<0.001 (Significant)				

In I & D group, out of 25 patients, 17 (68%) had moderate / severe grade of pain (4-6), 7 (28%) of patients had pain of 7-9 with very severe grade and 1 (4%) had mild pain of 1-3 grade. In USG group, out of all the patients, 14 (56%) had mild pain of 1-3 grade, 10 (40%) had pain of moderate or severe grade and 1 (4%) had a pain of very severe grade ( $p<0.001$ ).

**Table 3: Organisms**

Organisms	I & D		USG guided	
	N	%	n	%
Diphtheroids	0	4.0	1	4.0
MRSA	6	24.0	6	24.0
Mycobacterium	0	0.0	5	20.0
P aeruginosa	2	8.0	2	8.0
S. aureus	11	44.0	8	32.0
Streptococcus aeruginosa	4	16.0	2	8.0
Streptococcus haemolytic	2	8.0	1	4.0
Total	25	100.0	25	100.0
Chi square p value=0.279 (Not significant)				

In I & D group, S.aureus was the reported in 11 (44%) of the patients, MRSA was seen in 6 (24%) of the patients, Streptococcus aeruginosa was seen in 4 (16%). In USG guided group, 8 (32%) patients had S aureus, 6 (24%) patients had MRSA, 5 (20%) had mycobacterium and 2 (8%) had Streptococcus aeruginosa (p=0.279).

## DISCUSSION

The traditional treatment for breast abscess consists of incision and drainage of pus along with anti-staphylococcal antibiotics. However, this method is associated with a increases time to heal, regular dressings, difficulty in breastfeeding and the occurrence of milk fistula. Recent research has shown that breast abscesses are treatable with a combination of repeated needle aspirations and vacuum drainage.

In a similar study from Andhra Pradesh, India, Voruganti et al compared the efficacy of the USG guided aspiration and I&D for abscess measuring less than 5 cm.<sup>5</sup> Similarly, Suthar et al evaluated the clinical outcomes between the USG guided aspiration and surgical drainage of the breast abscess with mean size of 4.97 cm in lactational women from Gujarat.<sup>6</sup> Chandika et al conducted an RCT study in Uganda to determine whether USG guided abscess aspiration is effective when compared with the I&D for the breast abscesses of size up to 5 cm.<sup>7</sup> Afzal et al did a retrospective analysis of the women with breast abscess who underwent USG guided aspiration for the abscess and reported their clinical outcomes and determinants from Pakistan.<sup>8</sup>

In the present study mean age was 36.2 years and 40.2 years among the Incision & Drainage and USG guided aspiration of breast abscess groups, respectively, which was statistically similar. Naeem et al<sup>9</sup>, Elagili et al<sup>10</sup> and Voruganti et al<sup>5</sup> included younger age group of patients than our study (mean=28.38 years, median=28 years & 23.3-24.44 years). Suthar et al<sup>6</sup> included majority women in the age between 24 and 30 years. Pileri et al relatively younger age than our patients (mean=33.07), which might be due to fact that they included only breastfeeding women in their study.<sup>11</sup>

Significantly higher percentage of women in USG guided aspiration had comorbidities (56%) than the of the women in Incision & Drainage group (28%) In contrast, Afzal et al<sup>8</sup> and Pileri et al<sup>11</sup> reported lower comorbidities rate in their USG guided study group (14%&6.3%), which might be due to relatively younger age in their study than ours.

Breast abscesses are more prevalent in breastfeeding women but can develop in non lactating women as well. It is vital to screen out more severe disease such breast cancer when a non-lactational woman appears with signs and symptoms of breast abscess. In the present study, 72% of the women were lactating in the Incision & Drainage group, which was significantly higher than the

USG guided aspiration group (52%). USG guided has showed good results on lactations women as the patient can breastfeed immediately after aspiration. Afzal et al<sup>8</sup> and Voruganti et al<sup>5</sup> also reported majority breast abscess patients to be lactational, similar to our study. In contrast, Elagili et al<sup>10</sup> reported non-lactating abscess (53.3%) more than that of lactating abscess (46.7%) in their study.

The mean number of days of hospital stay after the procedure was significantly lower in the USG guided aspiration group (2.4 days) than the Incision & Drainage group (5.5 days) in the present study. Naeem et al<sup>9</sup> reported a hospital stay of 1-3 days for I&D group, while the USG aspiration group was treated on OPD basis. This shows the reduced hospital stay duration in the USG aspiration group, which in turn will reduce the cost of treatment as well as the incidence of the nosocomial infections.

In the present study, significantly higher proportion of the USG guided aspiration women (40%) had a repeat procedure than the Incision & Drainage group (8%). In contrast, Chandika et al<sup>7</sup> reported a higher success rate (93.1%), with only 6.9% going for re-aspiration. Within the repeat procedure in USG guided aspiration, 28% of the women in our study had repeat USG guided and 12% had I&D, while none were shifted to I&D method in Chandika et al<sup>7</sup>. Rigourd et al<sup>12</sup> reported similar success rate of single sitting aspiration under the USG guidance among for women in France (64.3%). Elagili et al<sup>10</sup> reported a cure rate of 50% in the onetime aspiration under USG, while 50% of the patients required till 5 aspirations. The overall success rate in Elagili et al<sup>10</sup> patients was 83.3%, while rest had to undergo the incision and drainage procedure.

Scar is a significant cosmetic issue which affects the personal and social well-being of the women. Traditional I&D of abscess drainage has indeed shown to have undesirable outcome, cosmetically. In the current study, significantly lower proportion of the USG guided aspiration group (28%) had scar than the Incision & Drainage group (100%). Scar has been reported a complaint by patients who had I&D in the Suthar et al<sup>6</sup> study. Strauss et al patients who underwent USG guided aspiration reported satisfactory cosmetic outcome of the abscess management.

Complications in form of recurrence (40%) and granuloma (4%), was significantly higher in the USG guided aspiration group than the Incision & Drainage group (recurrence- 8%), in the present study. Chandika et al<sup>7</sup> found a statistically similar healing rates between the USG guided aspiration and the I&D group of patients. Also, Chandika et al<sup>7</sup> reported nil recurrence in the USG guided group, which is in contrast to our findings.

Women who had USG guided aspiration reported significantly lower intensity of pain than the Incision & Drainage group. Suthar et al<sup>6</sup> reported pain as the most common complication among the USG aspiration group, while mammary fistula was the most common complication among the I&D group.

Abscesses in the breast are almost often brought on by organisms that have colonised the skin. In the current study, among the Incision & Drainage group, *S aureus* (44%), followed by MRSA (24%) and *Streptococcus aeruginosa* (16%) were the most common organism. Similarly, Among the USG guided aspiration group, *S aureus* (32%), followed by MRSA (24%) and *Mycobacterium* (20%) were the most common organism. However, there was no significant association between the groups and organism cultured. The most prevalent causal agent is *S. aureus*, followed by coagulase-negative *Staphylococci* as the second most common causal agent. *S. aureus* enters the abscess through cracked nipple. Afzal et al<sup>8</sup>, Chen et al<sup>13</sup> and Pileri et al<sup>11</sup> also reported *S. aureus* as the most

common organism in culture, but the proportion was much higher than our study (64.8%, 88% & 72.9%-100%) while only 24% showed MRSA in our study, higher proportion of breast abscess was found to have MRSA (37.5%-56.2%) as well as MSSA (37.5%), in the Pileri et al<sup>11</sup> study. Thus, culture-sensitivity of the breast abscess after the I&D or USG aspiration is must to identify the organism and tailor the antibiotic regimen, accordingly for better outcomes. For patients at high risk, it is recommended to initiate with anti-biotics which are sensitive to MRSA, empirically.

## CONCLUSION

Study concluded that USG guided aspiration of breast abscess significantly reduced the post-procedure hospital stay, scar incidence and pain than the conventional surgical management by the incision and drainage. Significantly high recurrence of abscess and repeat procedure (including conversion to I&D) were reported in the USG guided aspiration group of women than the I&D. Thus, there was a mixed result on the efficacy of the USG guided aspiration of breast abscess, in the present settings. The duration of follow-up must be increased to include the healing rate of the breast abscess between the study group and control group, and the cost-effectiveness of the USG guided aspiration should be evaluated.

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