

## Ultrasound Guided Aspiration Vs Surgical Drainage on the Management of Breast Abscess: A Comparative Study

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### How to cite this article:

Shruthi Rahul Pandit, Dinesh BV. Ultrasound Guided Aspiration Vs Surgical Drainage on the Management of Breast Abscess: A Comparative Study. *New Indian J Surg.* 2019;10(6):593-596.

### Abstract

Breast abscess is one of the common general surgical condition often affecting lactating women, it is very widely treated by incision and drainage in the peripheral centres where USG guided aspiration is not available. The aim of this study was to establish if USG guided aspiration is better, cost-effective and more feasible treatment option for breast abscess compared to Incision and Drainage. In our study, total of 154 patients divided into Two Groups, one underwent Incision and drainage and other USG guided aspiration. Many variable like age, parity, clinical features, USG findings were compared in the results we found that USG guided aspiration is easy procedure, cost-effective, well-accepted by the patient, less recurrence rate, more healing rate and also less hospital stay.

**Keywords:** Incision and Drainage; USG guided aspiration; Breast abscess; Comparative study.

### Introduction

Localized collection of pus within the breast tissue is called a breast abscess. It usually develops as sequel of cellulitis or mastitis which does not respond to antibiotics, however, it can be also be first presenting feature of a breast infection. It is a common staphylococcal soft tissue infection

which is characterized by local pain, swelling, and redness associated with swelling that may or may not be fluctuant. It is common in young and lactating women. It causes significant morbidity in young women especially in developing countries where the incidence of breast abscess is higher due to poor nutrition and poor hygiene. 0.4 to 11 of breast feeding mothers develop breast abscess.<sup>1</sup> According to Cochrane database review done in 2013 in Canada the incidence of mastitis in lactating women is as high as 33%.<sup>2</sup> Restricted feeding of the infant or ineffective positioning of the infant during breast feeding leads to breast engorgement and mastitis, usually culminating in an abscess. Risk factors for lactational breast abscess include gestational age more than 41 weeks, maternal age more than 30 years and first pregnancy. The most common organism isolated in lactational breast abscess is *Staphylococcus aureus*.

Diabetes mellitus, rheumatoid arthritis, trauma to breast, steroid intake are all risk-factors for non-lactational breast abscess. One important risk-factor associated with non-lactational breast abscess in smoking. It is also the only factor associated with recurrence of breast abscess.<sup>3</sup> Traditionally first line treatment of breast abscess in India consist of Incision and drainage along with the antibiotic therapy. However, I & D is associated with prolonged hospital stay, need for general anesthesia, and increased cost of treatment and daily dressings.

### Materials and Methods

Ours is an observational, prospective and

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**Received on** 07.10.2019, **Accepted on** 13.11.2019

retrospective cohort study conducted at a single centre. All patients who presented to Kasturba Hospital Manipal with diagnosis of breast abscess between September 2016 and July 2018 were included in study. Sample size was 154. They were divided into Group A underwent Incision and Drainage, and Group B underwent USG guided aspiration. They were followed up for 6 months to look for recurrence. All the female patients aged more than 18 years presented with clinical features of breast abscess and confirmed by USG were included. Patients with recurrent or chronic breast abscess, necrotic skin patch overlying the abscess, ruptured or partially drained abscess and patients who did not follow up for 6 months were excluded. Primary outcome variables are being healing time which is defined as time from initial procedure to patient's last visit without symptoms. Cure rate defined as patients who do not require further invasive treatment, such as I & D or repeat drainage procedures in the same breast quadrant within 6 months. Other variables compared are length of hospital stay and cost of treatment.

### Statistical Analysis

Evaluation of the continuous variables was done using standard *t*-test and Mann-Whitney *U* test. Evaluation of categorical variables was done using Chi-square and Fisher's test. Results were analyzed using SPSS software version 20.0. A *p* - value < 0.005 is chosen to be significant for all cases.

### Results

Total of 233 cases of breast abscess presented to our hospital during the study period. 33 patients did not undergo USG, 37 patient did not follow up for 6 months, 4 patients had necrotic skin patch overlying the abscess, 5 patients had ruptured abscess. Total of 154 patients were included in the study, 78 underwent Incision and Drainage and 76 underwent USG guided aspiration. Patient's characteristics and demographic data are presented in Table 1. Age, parity, lactational status did not vary significantly in both the Groups. *p* - value is insignificant. Mean age in I & D Group is 31.12 and 30.78 in Aspiration Group. 71 (91%) in I & D Group and 72 (94.7%) in Aspiration Group are multiparous. 48 (61.5%) in I & D Group and 48 (63.1%) in Aspiration Group are lactating. 45 (57.7%) in I & D Group and 41 (53.9%) in Aspiration Group are multi-loculated abscess. And *p* - value is not significant between the Groups. It was found that patients with multi-loculated

abscess who underwent USG guided aspiration required 2 or more aspiration for adequate drainage (Table 1).

**Table 1:** Demographic data

	I & D (N-78)	Aspiration (N-76)	<i>p</i> - value
Age	18-62 (Mean 31.12)	19-54 (Mean 30.78)	0.401
Multiparous	71 (91%)	72 (94.7%)	0.187
Lactating	48 (61.5%)	48 (63.1%)	0.206
Duration of swelling	1-90 (Mean 10.3)	1-60 (Mean 9.2)	0.301
Pain	76 (97.4%)	74 (97.3%)	0.489
Fever	38 (48.7%)	32 (42.1%)	0.053
TLC counts	5200-28100 (Mean 12,296)	5300-2200 (Mean 12,263)	0.478
Multi-loculated	45 (57.7%)	41 (53.9%)	0.321

Duration of breast swelling, pain and fever are comparable between the Two Groups and there is no statistical significance. Total of 7 patients presented with breast swelling alone without pain, all are non-lactating women. On culture 25 in I & D Group and 26 in USG group had no growth. Total 100 patients grew *Staphylococcus aureus*, 38 were methicillin resistant. All MRSA were lactating and all are carriers. 1 patient grew *Citrobacter*, 1 grew *proteus* and 1 grew *E coli*. Total leucocyte count (TLC) out of 154 patients 48 had counts ranging from 8,000 to 11,000. The mean TLC in I & D Group is 12,296, whereas in USG group is 12,263, *p* - value is not significant. It was found that patients with higher TLC in both groups are more likely to recur.

Mean duration of hospital stay was 4.3 days in I & D Group and 1.4 days in USG Group. Difference was found statistically significant, *p* < 0.0001. Out of 76 in Aspiration Group 29 admitted for procedure and 47 underwent aspiration outpatient basis. While comparing the cost of treatment only patient admitted in general ward were considered, hence 68 in I & D Group and 70 in Aspiration Group compared in this variable. The cost of dressing was included in I & D Group. The mean cost of treatment in Aspiration Group was

INR 3938 which is less than half of I & D group that is INR 11693. The difference was found to be statistically significant *p* < 0.0001. Cure rate shown Table 2 in I & D Group is 83.3% while in Aspiration group is 86.8%. Mean cure rate is 84.1% on performing the Chi-square test on cure rate no statistically significant difference was found between the Groups. 13 patients in I & D Group recurred out of which 8 managed with antibiotics and 5

repeat surgery. 10 in aspiration arm recurred 7 were managed conservatively with antibiotics, 2 required repeat USG Aspiration and 1 required incision and drainage. Mean healing time for Aspiration Group was 12.2 days, which is significantly shorter than that of I & D Group which was 18.1 days ( $p < 0.0001$ ) (Table 2).

**Table 2:** Cure rate

	I & D	USG aspiration	Total
Recurrence within 6 months	13 (16.7%)	10 (13.2%)	23 (14.9%)
Did not recur	65 (83.3%)	66 (86.8%)	131 (85.1%)
Total	78	76	154

In USG guided Aspiration Group repeat aspirations were done within 30 days of initial sitting. All aspirations done after 30 days are considered as recurrence. 30 patients in Aspiration Group were cured by single aspiration, 28 required 2 aspirations. It was found that multi-loculated abscess required 3 or more aspirations.

**Discussion**

In our study, the incidence of lactational breast abscess was found to be 62.3% which was much lower as compared to other studies. Suhail Khan et al. reported an incidence of lactational breast abscess as high as 90%.<sup>4</sup>

Rathin Sarkar et al. also reported the incidence of lactational breast abscess to be 90%.<sup>5</sup> The rising incidence of breast abscess among non-lactational women may be due to the rising incidence of smoking in Indian women. Smoking is a proven risk-factor for breast abscess and also causes recurrent abscesses. Also, the reason for fall in incidence of lactational breast abscesses can be attributed to better health care and increasing awareness of breast infections in the puerperal period. Sandhu et al. in her study reported an incidence of non-lactational breast abscesses to be 68%, higher than that of lactational abscesses.<sup>6</sup> In our study, the most common causative organism in both lactational and non-lactational breast abscesses was Staphylococcus aureus which grew in 64.9% of all breast abscesses. This is comparable to other Indian studies Sandhu et al. 60% cases were attributed to Staphylococcus aureus,<sup>6</sup> Ramakrishnan et al, reported 84% of all abscesses growing Staphylococcus aureus,<sup>7</sup> however, none of them were MRSA as compared to our study where 24.6% of the patients grew MRSA.

In this study, the mean duration of hospital stay was only 1.4 days which was significantly shorter than the Incision and Drainage Group which was 4.3 days. Of the 76 patients who underwent USG Guided Aspiration only 29 were admitted for the procedure whereas 47 patients underwent the procedure on an outpatient basis. The 29 that were admitted had high-fever or were admitted for observation. All patients undergoing Surgical Drainage needed to be admitted for a minimum of 2-3 days. USG Aspiration is a simple procedure which can be done on an outpatient basis. This is particularly useful in lactating mothers with breast abscesses since they need not interrupt breast feeding during treatment. On the other hand, patients who undergo Surgical Drainage have to interrupt breast feeding in order to undergo surgery. Also, postoperatively they have difficulty in feeding due to pain of incision and overlying dressing.

The mean cost of surgical drainage in our study was INR 11693 which was more than twice that of the Guided Aspiration Group which was INR 3938. This is comparable to a study by Chandika et al. who reported a cost-effectiveness ratio of Needle aspiration 2.85 times that of Incision & Drainage.<sup>8</sup> Most of the patients in the guided Aspiration Group did not require admission for the procedure. This is one of the factors which contributed to the decreased cost of treatment in this group. Also, in patients undergoing Surgical Drainage, the cost increases not only due to the charge of the procedure but also due to the charge of daily dressings.

The cure rate in the Aspiration Group in this study was 86.8%, only slightly higher than that of the Surgical Drainage Group which was 83.3%. This was in contrast to a large meta-analysis done by Fu Bing et al. who reported a cure rate of 95% in the needle Aspiration Group as compared to 82% in the Surgical Drainage Group.<sup>9</sup> This was probably due to the fact that in this study along with needle aspirations cavity washings were also given.

Many argue that the loculi in a breast abscess cannot be tackled by a needle aspiration. However, in our study even multi-loculated abscesses were treated with 2 or more sittings of aspiration. The healing time in this study was significantly shorter for the USG Aspiration Group (12.2 days) as compared to Surgical Drainage (18.1 days). This is comparable to Chandika et al. who reported a mean healing time of 9.9 days in the needle Aspiration Group as compared to 12.5 days in the surgically incised group. This difference is due to the longer time an incision scar takes to heal as compared to a simple needle prick. There are several limitations

to this study. Firstly, the presence or absence of comorbidities was not considered.

Diabetics have an increased incidence of breast abscesses and also a longer healing time. Also, the antibiotic treatment and size of breast abscesses was not taken into account which can significantly alter the healing time in an abscess.

### Conclusion

USG guided aspiration has several advantages over I & D with respect to:

- Faster healing time;
- Decreased cost of treatment;
- Decreased length of hospital stay;
- Eliminating the need for admission;
- No dressings required.

In this study the recurrence rates and the cure rates were comparable for both the groups. Most patients who come with a breast abscess would be lactating mothers. With USG guided aspiration, the mother can continue lactating and need not interrupt feeding. The need for daily dressings and risk due to anesthesia can be eliminated and the cost of treatment is significantly reduced. This is particularly important in our country where most patients refrain from coming to the hospital due to the cost of treatment.

*Acknowledgement:* Wish to acknowledge the help and contributions of all the surgical staff of Department of General Surgery and Radiology KMC Manipal Udupi.

*Ethical Clearance:* Ethical clearance taken from Institutional Ethics Committee, (Reg no/146/Inst/KA/2013/RR-16) IEC: 108/2017.

### References

1. Dener C, Inan A. Breast abscesses in lactating women. *World J Surg* 2003;27(2):130-33.
2. Jahanfar S, Ng CJ, Teng CL. Antibiotics for mastitis in breastfeeding women. *Cochrane Database Syst Rev* 2009;(1):CD005458.
3. Gollapalli V, Liao J, Dudakovic A et al. Risk factors for development and recurrence of primary breast abscesses. *Journal of the American College of Surgeons* 2010;211(1):41-48.
4. Khan SM, Khan AA, Kanth AN, et al. Changing the paradigm of breast abscess management- Ultrasound aspiration and suction drain *vs* Incision and Drainage in treatment of breast abscess. *Journal of medical science and clinical research* 2017 November;5(11):30754-60.
5. Sarkar J, Mandal N, Halder S, et al. Comparative study of USG Guided aspiration *vs* Incision and Drainage in the treatment of breast abscess. *Indian Journal of Research* 2017 August;6(8):120-22.
6. Sandhu GS, Gill HS, Sandhu GK, et al. Bacteriology in Breast Abscesses. *Sch J App Med Sci* 2014;2(4E):1469-72.
7. Ramakrishnan R, Trichur RV, Murugesan S, et al. Analysis of the microbial flora in breast abscess: A retrospective cohort study conducted in the emergency department. *Int Surg J* 2017;(4):2143-47.
8. Chandika. Ultrasound Guided Needle Aspiration *vs* Surgical Drainage in the management of breast abscesses: A Ugandan experience. *BMC Research Notes* 2012;5(12).
9. Fu Bing, Li Jie. Ultrasound guided needle aspiration and cavity washing *vs* incision and drainage to treat breast abscesses: A meta-analysis. *Int J Clin Exp Med* 2017;10(6):8656-65.