

A COMPARATIVE STUDY OF DRAINAGE OF BREAST ABSCESS BY CONVENTIONAL INCISION AND DRAINAGE VERSUS SUCTION DRAINAGE VERSUS ULTRASOUND-GUIDED NEEDLE ASPIRATION

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ABSTRACT

Objectives: Breast abscesses are common among lactating women most prevalent in developing countries because of poor hygiene, malnutrition, and health conditions. In era of technical advances management of breast abscess has shifted to minimally invasive and painless techniques which are more patient friendly. This study compare outcomes in management of breast abscess by ultrasound-guided needle aspiration, suction drainage, and incision and drainage procedure.

Methods: The present study was conducted in department of surgery in collaboration of MGM Medical College Indore with Government Medical College, Khandwa. A total 120 patients of breast abscess were divided in three groups. One group was managed by incision and drainage second group by suction drainage and third group by ultrasound-guided needle aspiration (40 patients in each group).

Results: In our study, total 120 patients were analyzed, majority of the cases (40.8%) belong to 21–25 years age group. Post-operative pain, high recurrence rate, fistula formation, cessation of breast feeding, ugly scar formation, and longer duration of hospital stay were observed in incision and drainage procedure.

Conclusions: USG-guided needle aspiration was the safest, cost effective, and widely accepted procedure in the treatment of breast abscess as compared to incision and drainage.

Keywords: Breast abscess, Incision and drainage, Suction drainage, USG aspiration.

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INTRODUCTION

Breast abscess is a leading cause of morbidity among women in developing countries, while they are less common in developed countries as a result of improved maternal hygiene, nutrition, standard of living, and early administration of antibiotics [1]. Breast abscess is most dreaded complication of mastitis more common in lactating mothers. The etiology behind mastitis to convert into breast abscess occurs in the setting of the breastfeeding problems which typically result in prolonged engorgement or poor drainage [2]. Early diagnosis and prompt proper treatment of mastitis is the key to avoiding complications [3]. Wide range of treatment of the breast abscess from conservative management to surgical intervention, traditionally surgical incision and drainage are the treatment of choice in breast abscess [4]. The treatment of breast abscesses poses a difficult clinical problem [5]. Traditional method of the management of breast abscess involves incision and drainage was associated with need for general anesthesia, prolonged healing time, regular dressing, difficulty in breastfeeding, and possible unsatisfactory cosmetic outcome [6]. In the era of minimally invasive surgery, a more conservative approach for managing breast abscess using percutaneous needle aspiration and systemic antibiotics has also been facilitated with introduction of high resolution real-time sonography [7,8]. Ultrasound has been shown to be useful in diagnosis of breast abscesses, guiding needle placement during aspiration and also enables visualization of multiple abscess loculation and thus useful in needle aspiration and re-aspiration of breast abscesses. This procedure has been used successful and is associated with less recurrence, excellent cosmetic result and has less costs [9]. The aim of this study is to compare conventional versus open drainage with negative suction drain placement and ultrasound-guided needle aspiration in the breast abscess management.

METHODS

This prospective and comparative study was conducted in collaboration of M.G.M Medical College and M.Y Hospital, Indore with Government Medical College, Khandwa, India. Duration of the study was 1 year.

Inclusion criteria

The following criteria were included in the study:

1. Age 18–40 years female
2. Patients who give written informed consent
3. Size >3 cm.

Exclusion criteria

The following criteria were excluded from the study:

1. Patients not willing to give written consent.
2. Patient with skin disease
3. Size <3 cm
4. Chronically ill patients (HIV, HBSAg, and Immunodeficiency)
5. Antibiooma
6. Malignancy.

These patients were admitted and subjected to the required preoperative investigations such as blood sugar, PT/INR, complete blood count, and pre-operative ultrasonography. Patient was explained the procedure and informed consent was taken before procedure. Patients were undergone divide into three groups and perform conventional incision and drainage (I and D) and open I and D with percutaneous placement of suction drain and USG-guided aspiration. Taking all aseptic precautions procedure was done under short GA. Pus was sent for culture and sensitivity. Patient was kept NBM for at least 5 h. Patient was started on I.V. antibiotics on day of procedure and then shifted on oral antibiotics and analgesic.

All three groups were compared on the basis of following outcomes:

1. Post-operative pain
2. Duration of hospital stay
3. Resolution time (post-operative USG and follow-up visits 1st, 2nd, and 4th post-operative week)
4. Appearance of scar
5. Recurrence/fistula
6. Continuation of breastfeeding/emptying/milk suppression.

Data were analyzed using SPSS software, results of treatment groups were compared using test to access the hypothesis and p<0.05 was taken as, statistically significant.

RESULTS

A total of 120 patients of breast abscess from age 18 to 40 years were enrolled in this study. The study participants divided into three groups (40 patients in each group). The outcome of each group was evaluated clinically on the basis of above mentioned outcome basis criteria's. The highest percentage of respondents, that is, 40.8% belonged to 21-25 years, details age groups distribution is shown in Fig. 1.

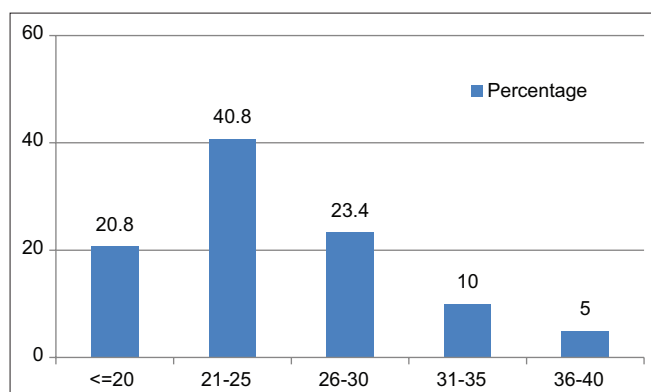


Fig. 1: Distribution based on age group

Table 1: Cross tabulation between treatment groups and post op pain

Visual analogue scale	Procedure					
	Incision and drainage		Suction drainage		USG aspiration	
	N	%	N	%	N	%
0	0	0	0	0	31	77.5
2	1	2.5	33	82.5	8	20
4	13	32.5	6	15	1	2.5
6	25	62.5	1	2.5	0	0
8	1	2.5	0	0	0	0
10	0	0	0	0	0	0

Table 2: Cross tabulation between treatment groups and duration of hospital stay

Day of discharge (post op day)	Procedure					
	Incision and drainage		Suction drainage		USG aspiration	
	N	%	N	%	N	%
Day 0	0	0	0	0	29	72.5
Day 1	0	0	22	55	9	22.5
Day 2	4	10	12	30	2	5
Day 3	11	27.5	4	10	0	0
Day 4	17	42.5	2	5	0	0
Day 5	8	20	0	0	0	0

Out of 120 specimens, only 98 showed bacterial yield (81.7%). Of these, 20 (20.4%) were polymicrobial. The most common organism was *Staphylococcus aureus*, present in 56 of 78 (71.8%) aerobic cultures, with MRSA in 34 (60.7%). The remaining organisms included coagulase-negative *Staphylococcus*, *Pseudomonas aeruginosa*, *Proteus mirabilis*, and other isolates.

Pain score was high (6) on visual analogue scale among incision and drainage group as compared to other groups.

Longer duration of hospital stay (3-4 days) was found in I and D group as compared to suction drainage and USG aspiration groups.

Recurrence rate was higher (12.5%) in incision and drainage group, 7.5% in suction drainage group and lower 2.5% was in USG aspiration group.

Table 3: Cross tabulation between treatment groups and recurrence

Recurrence	Procedure					
	Incision and drainage		Suction drainage		USG aspiration	
	N	%	N	%	N	%
Yes	5	12.5	3	7.5	1	2.5
No	35	82.5	37	92.5	39	97.5
Total	40	100	40	100	40	100

Table 4: Cross tabulation between treatment groups and feeding status

Feeding status	Procedure					
	Incision and drainage		Suction drainage		USG aspiration	
	N	%	N	%	N	%
Breast feed	22	55	30	75	34	85
Empty	6	15	7	17.5	5	12.5
Milk Suppression	8	20	1	2.5	0	0
Nothing	4	10	2	5	1	2.5
Total	40	100	40	100	40	100

Table 5: Cross tabulation between treatment groups and Scar

Scar	Procedure					
	Incision and drainage		Suction drainage		USG aspiration	
	N	%	N	%	N	%
Minimal Scar	5	12.5	37	92.5	39	97.5
Ugly Scar	35	87.5	3	7.5	1	2.5
Total	40	100	40	100	40	100

Table 6: Cross tabulation between treatment groups and resolution time

Resolution time (days)	Procedure					
	Incision and drainage		Suction drainage		USG aspiration	
	N	%	N	%	N	%
1-5	-	-	4	10	19	47.5
6-10	5	12.5	30	75	17	42.5
11-15	23	57.5	5	12.5	2	5
16-20	12	30	1	2.5	0	0

Highest percentage (85%) of patient doing continue breast feeding after USG-guided aspiration and lowest percentage (55%) was in incision and drainage group.

Minimal (2.5%) chances of scar formation were observed in USG-guided aspiration group.

Resolution time was very high in Incision and drainage group as compared to the suction drainage or USG aspiration group.

DISCUSSION

The present study was carried out among the patients of breast abscess attending the department of surgery at tertiary care center. There were total 120 patients with breast abscesses which were randomized into three groups (40 in each group) for incision and drainage, suction and drainage, and ultrasound guided aspiration. We have included patients between 18 and 40 years childbearing age group. In our study, majority of the patients (64.2%) were lactating age group (21–30 years) which was comparable with the Kataria *et al.* [10]. We have observed that *S. aureus* was isolated predominantly from pus culture which was concordance with the Elliman *et al.* [11]. Current study found that post-operative pain was significantly higher with incision and drainage group as compared to suction and drainage and USG aspiration group similar results were also obtained by Odiya *et al.* [12], this could be due to incision and drainage (invasive) involve comparatively big incision for draining and breaking locules in abscess cavity and there is significant post-operative pain associated with this procedure. Most of the patients complained of daily change of dressings, especially packing of wound, as painful and cumbersome. I and D groups show the highest percentage of ugly scar formation while primary suturing and negative drain placement is cosmetically effective as there is small incision but USG-guided aspiration were more cosmetically effective with no scar formation accordance with Kataria *et al.* [13]. As USG aspiration shows minimal invasive with minimal post-operative pain, so maximum patients (85%) continued breast feeding while rest were adopted emptying and milk suppression due to fear of passage of organisms to baby while in I and D only 55% patients continue breast feeding because of pain and highly invasive, concordance with Kandi *et al.* [14]. In USG-guided aspiration 72.5% discharge on the same day of the procedure because it is minimally invasive while in incision and drainage more than 50% patients discharge after 3–4 days of procedure due to high invasion and more pain concordance with the Wei *et al.* [15]. Recurrence rate was very low (2.5%) in USG aspiration and significantly high (12.5%) in I and D found in our study comparable with Chandika *et al.* [16] observed 0% recurrence rate in their study. Resolution time was faster in USG aspiration as compared to percutaneous drain placement and incision and drainage, accordance to the Fahrni *et al.* [17]. Moisture is maintained and antibiotic instillation in cavity can be done. High chances of developing milk fistula in incision and drainage as compared to the USG-guided aspiration comparable with the Saleem *et al.* [18].

On comparison of these three technique (incision and drainage, suction drainage, and USG aspiration) in the management of breast abscess, we have found that USG-guided aspiration was the most effective and accepted procedure as compared to other.

CONCLUSION

We have concluded that USG-guided aspiration is simple, safer, cost effective, and widely accepted procure for breast abscess management. USG aspiration was less invasive, cause less post-operative pain, minimal scar formation, not interrupt breast feeding, very low recurrence rate, and less hospital stay as compared to incision and drainage.

AUTHORS CONTRIBUTIONS

AC: Conceived and designed the study, conducted research, provided research materials, and collected and organized data. AKP: Provided logistics support and supervised the procedures, analyzed and

interpreted data reviewed and edited manuscript. RY: Wrote initial and final draft of article, correspond the article. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

CONFLICT OF INTEREST

The authors have no known conflicts of interest to declare.

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