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A Comparison of Needle Aspiration Versus Incision & Drainage of Breast Abscess in Terms of Complications and Outcomes

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ABSTRACT

Background: Incision and drainage (I&D) and Needle aspiration are the most common treatment modalities for breast abscesses. Incision and drainage (I&D) is the traditional approach, while ultrasound-guided needle aspiration (USGA) offers a less invasive alternative. This study aimed to compare the efficacy and outcomes of USGA and I&D in managing breast abscesses in women

Methods: This comparative study was carried out in the department of surgery, Sanjay Gandhi Memorial Hospital, Shyam Shah Medical College, Rewa (M.P.). The study included 100 women with breast abscesses, divided into two groups; USG guided aspiration (group A) and I & D (group B). Data on treatment outcomes, and complications were compared and analysed.

Results: USG observation shows that the diameter, number and volume of abscess cavity were significantly differ among I & D and aspiration groups ($p<0.05$). The wound healing were significantly faster (97.7%) among aspiration group as compared to I & D (82.5%) groups ($p<0.05$). Hypertrophic scar was significantly higher in I & D group ($P<0.05$) and recurrence rate was higher in aspiration group. Pain score and mean hospital stay was higher in I &D group.

Conclusions: Percutaneous needle aspiration in breast abscess was successful and affective treatment method as compared to incision drainage with less complications and high satisfaction rate among the women.

Keywords *Breast abscess, percutaneous aspiration, Incision drainage, outcomes*

1. INTRODUCTION

Breast abscess is a major cause of morbidity in women, posing a continuing health issue despite advances in maternal cleanliness, nutrition, living conditions, and the early use of antibiotics [1].

A breast abscess is indicated by a little buildup of pus inside the breast tissue. Breast infections are the most common benign disorder affecting the breast during and after pregnancy. The most common type of infection is mastitis, which can progress to an abscess if treatment is not received [2]. Young women, women from low socioeconomic origins, obese patients, smokers, women with diabetes mellitus, and women with HIV-related diseases are more likely to experience breast abscesses than the general population [3]. Beyond just causing pain, breast abscesses can cause major problems like infection, recurring abscess formation, and difficulty nursing, which can have an adverse effect on the health of both the mother and the child [4].The incidence is closely linked to pregnancy and is primarily brought on by a kid piercing the nipple while feeding and bacterial colonization as a result of poor nursing technique and insufficient breast emptying. If breastfeeding is to continue and additional difficulties are to be avoided, prompt diagnosis and treatment are essential [5]. The physical examination is the primary method used to diagnose a breast abscess. To check for leucocytosis, a complete blood count can be taken. Cellulitis, which is characterized by an area of enhanced echogenicity, and liquefaction necrosis, which is characterized by a hypoechoic collection with floating debris that varies with posture, can be distinguished with a breast ultrasound [6]. To

verify the presence of a breast abscess, a needle aspiration is sometimes carried out and examined [7]. Breast abscesses are often treated with a surgical incision, digital septal disruption, contents drainage, occasionally surgical drain insertion, and systemic antibiotic administration. This approach frequently necessitates general anesthesia, can result in unsightly scarring, is less economical than aspiration, necessitates frequent dressing changes after surgery, and disrupts lactation. Breast abscesses in nursing women are often treated by incision and drainage, which carries the risk of scarring, patient unhappiness, and breastfeeding cessation [8]. Another treatment option for breast abscess is repeated needle aspiration, either with or without ultrasound guidance. This procedure has been linked to better cosmetic results, reduced expenses, and a decreased risk of recurrence [9]. A less invasive option that may have advantages including fewer scarring and a quicker recovery period is ultrasound-guided needle aspiration (USGA) [10]. Its effectiveness for larger or more complicated abscesses and the potential for recurrence, however, continue to raise concerns [11]. Even though I & D and USGA are both widely used, there is still a dearth of high-quality research that directly compares how effective they are in terms of important outcomes like patient-reported measures, recurrence, and residual abscess.

Aims and objectives: The objective of this study was comparison of incision & drainage versus USG guided aspiration in women with breast abscesses, in terms of complication and outcomes.

2. MATERIAL AND METHODS

This was **a** hospital based prospective, randomized study conducted in the Department of General Surgery, Sanjay Gandhi Memorial Hospital, associated with Shyam Shah Medical College in central India, from 1st September 2022 to 30th November 2023 (15 months duration).

A total of hundred women with breast abscess attended surgical OPD and casualty department/emergency department were enrolled and analysed

Inclusion Criteria:

- Women diagnosed with breast abscess
- Women age less than 60 years
- Patients who provided written informed consent for study

Exclusion criteria:

- Patient indicated for particular procedure at the time of presentation as per standard protocol.
- Patient of age more than 60 year.
- Patients who were not willing to provide consent for study.

All the patients were divided and studied under two groups:

Group A: underwent incision and drainage of breast abscess (N=57).

Group B: underwent needle aspiration of breast abscess (N=43).

Written inform consent was taken from all the patients before doing any procedure. The procedure of incision and drainage was done under anesthesia and Needle aspiration was done under all aseptic precautions

A physical examination was conducted, and the number, site, size, shape, and consistency of palpable breast mass /lump as well as mobility were noted. Laboratory investigations of Hb, TLC, DLC, blood glucose, blood urea, urine, culture and sensitivity of aspirate, USG (bilateral breast and axilla), X-ray, and fine needle aspiration cytology (FNAC) were done and recorded.

USG breast was done previously, and in follow-up, ultrasound was done on the third day of needle aspiration. The time taken for the resolution of symptoms (point tenderness, erythema, and fever), recurrence of breast abscesses, and healing time were recorded and followed until eight weeks. All relevant information will be collected and compared between both the groups

Statistical analysis: Data were analysed using SPSS-21 software. Quantitative data was presented with the help of the mean and standard deviation. Qualitative data was presented with the help of a frequency and percentage. T-tests, and chi-square tests, were employed to compare the two groups, with a significance level set at $p < 0.05$.

3. RESULTS

A comparison of the hemodynamic and laboratory parameters of study subjects in the groups. The mean pulse rate, mean DBP, mean hemoglobin level and mean total leucocyte count were not differ significantly between the aspiration and I & D groups ($P>0.05$), whereas mean SBP and mean platelets count was found statistically significant difference ($P<0.05$).

Table 1: Comparison of Hemodynamic and laboratory parameters of study subjects

Parameters	Group A (Mean ± SD)	Group B (Mean ± SD)	P-value
Pulse	81.81 ± 11.10	80.05 ± 11.62	0.446
SBP	113.30 ± 8.24	117.26 ± 8.72	**0.024**
DBP	70.53 ± 6.05	72.65 ± 5.52	0.071
Hb	10.07 ± 1.24	10.25 ± 1.35	0.486
TLC	9728.40 ± 2998.19	9719.19 ± 3175.66	0.988
Platelets	2.59 ± 0.74	2.11 ± 0.66	**0.001**

The results revealed that the mean volume of the abscess cavity and mean diameter of the abscess cavity in USG were found to be significant difference in both the groups (P<0.05)

Table 2: Comparison of mean cavity in USG of study subjects in the groups

Comparison of Cavity	Group A (Mean ± SD)	Group B (Mean ± SD)	P-value
Volume of Cavity	66.47 ± 22.63	44.00 ± 18.40	**<0.001**
Diameter of Cavity	3.94 ± 0.46	3.42 ± 0.48	**<0.001**

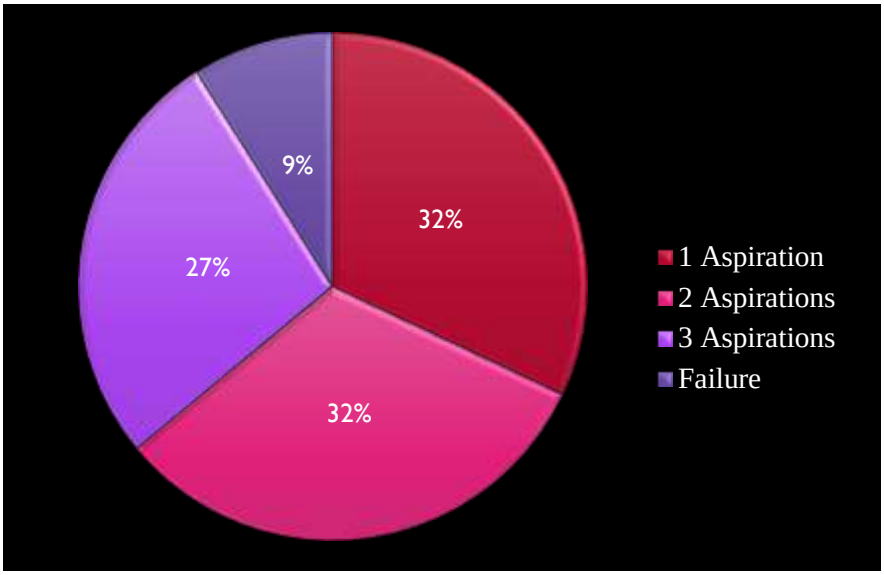
Majority of the patients had single abscess cavity and most of the abscess were resolved. Ultrasonographic observation shows that the diameter of abscess cavity, number of abscess cavity and resolved abscess were significantly differ among I & D and aspiration groups (p<0.05).

Table 3: Distribution in USG findings of study subjects in the groups

Abscess cavity finding in USG		Group A	Group B	P-value
Diameter of Cavity	<3 cm	0 (0%)	10 (23.7%)	**0.004**
	>3 cm	57 (100%)	33 (76.7%)	
Cavity Number	Single (1)	37 (64.9%)	37 (86%)	**0.017**
	Multiple (>/=2)	20 (35.1%)	6 (14%)	
USG Findings	Resolved	47 (82.5%)	41 (95.3%)	**0.04**
	Unresolved	10 (17.5%)	2 (4.7%)	

Among aspiration group, majority of the (32%) patients required one or two aspiration followed by 27% had required three aspirations

Graph 1: No. of Aspirations done among the study subjects



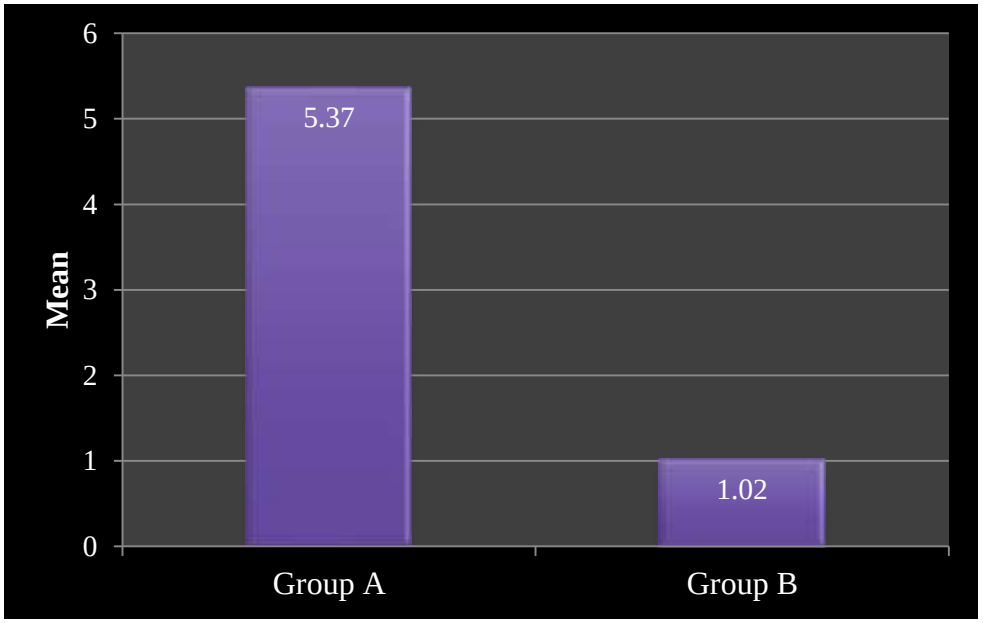
Among complications of breast abscess majority of the abscess wound were healed and no recurrence. The wound healing were significantly faster (97.7%) among aspiration group as compared to I & D (82.5%) groups ($p<0.05$). Occurrence of fistula was more in I & D group. Hypertrophic scar was significantly higher in I & D group ($P<0.05$) and recurrence rate was higher in aspiration group.

Table 4: Distribution of complications among the study groups

Complications		**Group A**	**Group B**	**P-value**
Wound	Healed	47 (82.5%)	42 (97.7%)	**0.01**
	Non Healed	10 (17.5%)	1 (2.3%)	
Scar and Fistula Formation	Fistula Formation	4 (7%)	1 (2.3%)	0.179
	Hypertrophic Scar	9 (15.8%)	0 (0%)	**0.002**
Recurrence	Absent	38 (66.7%)	36 (83.7%)	0.054
	Present	19 (33.3%)	7 (16.3%)	

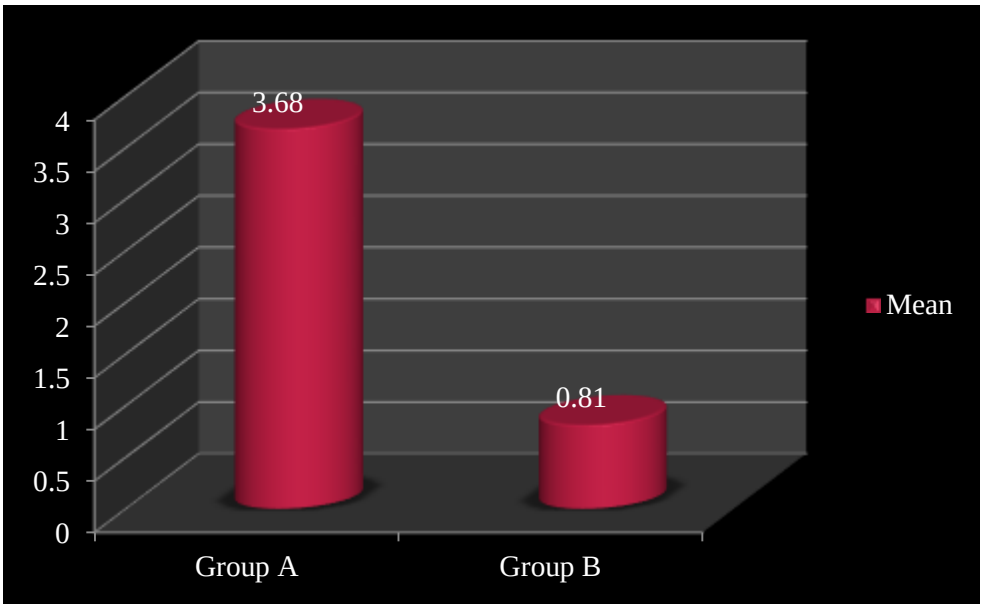
Pain score was higher in I & D group (5.37) as compared to aspiration group (1.02).

Graph 2: Comparison of mean pain score of study subjects in the groups



Mean duration of hospital stay was also significantly higher in I & D group (3.67) as compared to aspiration group (0.81).

Graph 3: Mean duration of hospital stay-wise distribution of study subjects in the groups



4. DISCUSSION

The two main treatment options for breast abscess were aspiration and incision and drainage. Aspiration involved using a needle to remove the pus from the abscess, while incision and drainage involved making an incision to drain the abscess. The selection of treatment depends on several factors, including the size, location, and severity of the abscess, as well as the patient's general health and personal preferences. Aspiration is the preferred treatment for small abscesses that are easily reachable, while incision and drainage is recommended for larger abscesses or those that are hard to access [12].

In our study pain scores and shorter hospital stays were significantly associated with aspiration group patients as compared to incision and drainage patients, similar findings reported by Shukla et al [13] and Sidra MD, et al [14]. The significantly lower pain scores and shorter hospital stays associated with USGA underscore its potential to enhance patient comfort and expedite recovery.

According to the current study findings, treatment outcome showed that recurrence rate was higher among aspiration group as compared to I & D groups, but it's not statistically significant, in agreement with the Fathy E, et al [15].

Hypertrophic scar were significantly associated with the I & D group in the current study, our results consistent with the Tariq et al [16] and Totadri VM, et al [17]..

Most patients require a single aspiration. Some patients with larger abscesses require multiple aspirations. This finding in our study is comparable to the observation of David M, et al [18]. Factors such as abscess located in the central area, pus volume exceeding fifty mL, aspiration performed more than three times, and treatment duration longer than fourteen days were identified as reasons for the failure of aspiration in lactating women.

In the present study the wound healing was significantly faster in aspiration group as compared to incision and drainage group; this is comparable to the study of Kasabe, et al [19].

Majority of the patients had single abscess cavity and most of the abscess were resolved in aspiration group in this study, in accordance with the Karvande R, et al [20].

We have found that on ultrasonographic observation the number & diameter of abscess cavity, and resolved abscess were significantly differ among I & D and aspiration groups ($p<0.05$), our findings comparable with the Hamid HS, et al [21].

The findings of this study contribute significantly to the growing body of evidence supporting the use of ultrasound-guided needle aspiration as a safe, effective, and patient-centered alternative to incision and drainage (I &D) for the management of breast abscesses in women. The observed advantages of USGA, including faster healing, reduced pain, superior cosmetic outcomes, and improved breastfeeding continuation, align with the conclusions of numerous recent studies [22-23].

5. CONCLUSION

This study highlighted that percutaneous needle aspiration are more effective and better approach then incision and drainage for treating breast abscesses, offering better outcomes with minimal complications. Aspiration group had faster healing, less pain, shorter hospital stay and less chance of scarring, but higher recurrence rate compared to the incision and drainage group. However, the treatment approach should be tailored to individual patient factors and preferences, with a shared decision-making process used to develop a personalized treatment plan that aligns with the patient's needs and goals. Although repeated aspiration are needed to obtain complete resolution, this therapy is a well-accepted alternative to surgical treatment

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