

# Comparison of Ultrasound Guided Needle Aspiration (ASP) and Incision and Drainage (I&D) in Lactating Breast Abscess

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## ABSTRACT

**Background:** Breast abscess (BA) is a major source of morbidity in underdeveloped nations, and treatment remains difficult. The most frequent treatments for BA include antibiotics, incision and drainage (I&D), and ultrasound-guided needle aspiration (ASP). There is mixed data about the effectiveness of ASP and I&D. **Objective:** To compare ultrasound guided needle ASP and I&D in lactating breast abscess. **Study Design:** Randomized controlled trail. **Settings:** Department of Surgery, Allied Hospital, Faisalabad Pakistan. **Duration:** Six months from July 01, 2021 to December 31, 2021. **Methods:** From total 70 patients, 35 (Group A) underwent USG guided ASP and 35 (Group B) underwent I&D under GA. Follow-up of patients was done after 30days and efficacy was noted. **Results:** Mean age of the patients in groups A and B was 28.915.24 and 29.044.05, respectively. Site of abscess in majority of patients (60% in group A and 48.57% in group B) was Infero-lateral. Mean abscess size was of  $3.41 \pm .38$  in group A and  $3.46 \pm 0.41$  in group B. Mean Healing time was  $22.0+1.86$  in group A and  $43.21+2.14$  in group B and a significant difference was noted in healing time of two groups (P0.002). Efficacy was 94.29 in group A and 77.14% in group B. **Conclusion:** The frequency of early success rate of USG guided needle aspirations in terms of early healing of breast abscess is significantly higher as compared to I & D.

**Keywords:** Ultrasound Guided Needle Aspiration, Incision and Drainage, Lactating Breast Abscess.

## INTRODUCTION

A breast abscess (BA) is an accumulation of purulent material within the breast that is localized. Mastitis complications are possible. BA is a major source of morbidity in underdeveloped nations, and treatment remains difficult. BA occurs in 0.4 to 11% of all breastfeeding women, however it can also develop in non-lactating females.<sup>1</sup> Such abscesses are more common at the start of breast feeding when an unskilled woman develops cracked nipples. They also develop during weaning when engorgement occurs as a result of insufficient drainage of breast milk.<sup>2</sup> BA is a serious clinical concern due to the accompanying patient pain and proclivity for recurrence. Lactational breast abscess is caused by Staphylococcus infection during breast feeding. The infection generally develops quickly since milk is an excellent culture medium.<sup>3</sup> Obesity, smoking, and mastitis are risk factors for the development of both primary and recurring lactational breast abscess.<sup>4</sup>

Antibiotics, I&D, and ultrasound-guided needle ASP are the most often used therapies for abscesses.<sup>5</sup> There are no clear criteria in the literature that demonstrate agreement on ASP or I & D therapy and follow-up.<sup>6</sup> The rate of abscess recurrence following I & D and ASP is comparable, but needle aspiration with ultrasound guidance provides the added benefit of faster healing and fewer problems. Ultrasound guided needle ASP is now often used to treat breast abscesses as a first-line therapy.<sup>7</sup>

The data for the effectiveness of ultrasonography guided needle ASP is contradictory. In 2019, Rehman *et al* did a study on the effectiveness of single needle aspiration in treating breast abscess and discovered that it was 97.1%.<sup>8</sup> In 2022, Qureshi *et al.* did research and discovered that it was 82.2%.<sup>9</sup> As a result, we designed this study to compare the two procedures, so that a technique with a better outcome in terms of continuation of breast feeding might be supplied to the patients.

## METHODS

Prospective Randomized controlled study was conducted at Department of Surgery, Allied Hospital Faisalabad Pakistan. The duration of the study was six months from July 01, 2021 to December 31, 2021.

Sample size of 70 patients (35 in each group) is calculated by WHO sample size calculator at 5% level of significance, 80% power of the study, and taking efficacy of aspiration group as 97.1% and incision and drainage as 82.9%.<sup>8</sup>

Breast Abscess affects all nursing women over the age of 18 and under the age of 45 were included in the study.

Patients who have recurring abscesses, breast abscess with warning indications of rupture, breast abscess that is covered in necrotic skin, breast abscess is now draining, patients who have a history of penicillin allergies and patients with co-morbidities like TB, TB and heart disease were excluded from the study.

Patients meeting the inclusion criteria were subjected to a comprehensive history and clinical examination, as well as baseline investigations, after the study was approved by an ethical review committee and informed consent was obtained. The presence of a fluctuant painful breast swelling was used to make a clinical diagnosis. Patients were subsequently taken to the radiology department for a USG scan (high frequency linear transducer of 7.5MHZ). The diagnosis was confirmed on USG by the presence of a thick-walled echo complex mass, predominantly cystic with internal echoes and septations. Patients divided in two groups by simple random sampling. Group A underwent aspirations by 14-gauge needle under cover of oral Co-amoxiclav 1g B.D for maximum of 14 days. 2% lignocaine HCl solution was used as local anesthetic. Group B underwent incision and drainage under general anesthesia. Each patient was given a shot of antibiotic at the time of induction of anesthesia. Post-operatively patients were kept NPO for 6 hours and treated by IV fluids, antibiotics and analgesics, and discharged when started orally. To eliminate bias, all the aspirations of the abscesses were done by the same consultant of the surgery department using the same ultrasound machine and same technique. Follow-up of patients was done after 30days and ultrasound was performed to confirm the efficacy of the procedure. Efficacy of ultrasound guided needle aspiration was termed as a total absence or presence of less than 5ml collection.

SPSS version 25 was utilized to enter and analyze all the collected data. Quantitative variables; e.g., age, size and quantity of abscess were expressed as mean and standard deviation. Frequency and percentage was utilized to demonstrate categorical data such as efficacy of the

aspiration. Chi-square test was employed taking p value  $\leq 0.05$  as significant.

## RESULTS

The patients' ages ranged from 18 to 45 years with a mean of  $28.91 \pm 5.24$  years in group A and  $29 \pm 4.05$  in group B. No significant difference was noted in age of the patients in both groups (p 0.31). Mean BMI was  $23.4 \pm 1.97$  in group A and  $23.51 \pm 2.18$  in group (P 0.11). 42.86% patients in group A and 40% group B were of ASA-I status while 57.14 in group A and 60% in group B were of ASA-II (P.323). Site of abscess in majority of patients (60% in group A and 48.57% in group B) was Infero-lateral. Mean abscess size was of  $3.41 \pm .38$  in group A and  $3.46 \pm 0.41$  in group B. Mean Healing time was  $22.0 \pm 1.86$  in group A and  $43.21 \pm 2.14$  in group B and a significant difference was noted in healing time of two groups (P0.002).

**Table 1: Baseline characteristics of the study participants**

Parameters		Group A	Group B	P Value
Age of patients		$28.91 \pm 5.24$	$29 \pm 4.05$	0.31
BMI		$23.4 \pm 1.97$	$23.51 \pm 2.18$	0.11
ASA Status	ASA-I	15 (42.86)	14 (40%)	.323
	ASA-II	20 (57.14)	21 (60%)	
Site of Abscess	Infero-lateral	21 (60%)	17 (48.57)	0.220
	Infero-medial	2 (5.71%)	1 (2.86)	
	Lateral	0 (0.00%)	1 (2.86)	
	Superior	0 (0.00%)	1 (2.86)	
	Supero-lateral	5 (14.29)	7 (20.00)	
	Supero-medial	7 (20.0%)	8 (22.85)	
Size of abscess (cm)		$3.41 \pm .38$	$3.46 \pm 0.41$	0.21
Mean lactation duration	Ion	$31.13 \pm 2.22$	$28.3 \pm 3.13$	0.47
Mean Healing time		$22.0 \pm 1.86$	$43.21 \pm 2.14$	0.002

Efficacy was noted in terms of total absence or presence of less than 5ml collection. Efficacy was 94.29 in group A and 77.14% in group B.

**Table 2: Efficacy in both groups**

		Efficacy		Total	P Value
		Yes	No		
Group	Group A	33	2	35	.042
		94.29	2.9%	50.0%	
	Group 2	27	8	35	
		77.14%	11.4%	50.0%	
Total		60	10	70	
		85.71	14.3%	100.0%	

## DISCUSSION

One of the female secondary sex characteristics is the breast. Breast abscess is becoming less of a concern in developed nations as maternal nutrition, cleanliness, level of living, and early antibiotic usage improve. Breast abscess, on the other hand, is a major problem for women in underdeveloped nations. Once a breast abscess has established, the goal is to drain the pus<sup>10</sup> I&D has traditionally been used to treat breast abscesses. Another potential therapeutic option for minor breast abscesses is ASP with USG.<sup>11</sup> The current study included 70 lactating women with a breast abscess who were randomly allocated to one of two treatment groups: USG guided ASP or I & D.

Mean of  $28.91 \pm 5.24$  years in group A and  $29 \pm 4.05$  in group B. The results of our study are comparable with other studies. Similar mean age of has been described by Javed *et al.* of women showing up with breast abscess at Bahawal Victoria Hospital, Bahawalpur.<sup>3</sup> The mean age was 24.16years ( $24.16 \pm 3.48$ ) years in group A and ( $25.52 \pm 3.87$ ) years in Group B in a study by Voruganti MR *et al.* indicating the involvement of young patients.<sup>12</sup> Mean healing time was  $22.0+1.86$  in group A and  $43.21+2.14$  in group B and a significant difference were noted in healing time of two groups (P0.002). Mean abscess size was of  $3.41 \pm .38$  in group A and  $3.46 \pm 0.41$  in group B. In a study, mean healing time was  $21.0+1.97$  in group A and  $44.23+3.15$  in group B and mean breast abscess size in Group-A was  $2.17+0.89$ cm and  $2.03+0.79$ cm in Group-B.<sup>13</sup> A meta-analysis performed by Fu Bing<sup>14</sup> in department of ultrasonography, China showed that the mean healing time in patients underwent ultrasound guided needle aspirations was less than I & D (p-value 0.000). Efficacy was 94.29 in group A and 77.14% in group B. In a study by Randhawa *et al.*, efficacy was 85.7% (n=30) of group A and 82.9% (n=29) of group B abscesses occurred in lactating females.<sup>8</sup>

The outcomes of the current study are comparable to the previous researches<sup>12,13,15-17</sup> and demonstrate that,

regardless of the patient's age, lactation status, the size of the abscess, or the amount of pus aspirated, a single ultrasound-guided needle ASP of a breast abscess is an efficient alternative to traditional incision and drainage, which supports its regular use in daily practice.

## CONCLUSION

In comparison to incision and drainage, the frequency of early success rate of USG guided needle aspirations in terms of early healing of breast abscess is much greater.

## LIMITATIONS

A strong limitation of this study was that the frequency of recurrence a was not considered which is also very important and should be taken into account before choosing it in regular practice.

## SUGGESTIONS / RECOMMENDATIONS

Such a study is highly recommended for future research.

## CONFLICT OF INTEREST / DISCLOSURE

No conflict of interest is involved.

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No.

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