

Ultrasound Guided Needle Aspiration versus Surgical Drainage in the Management of Breast Abscesses: A Comparative Observational Study

¹Dr. Megha A Dhamale, ²Dr. Tejashree P Junagade, ³Dr. Jayant M Gadekar,

¹Junior Resident, ²Assistant Professor, ³Professor and Head of Department
¹Department of General Surgery,

¹DVVVPF's Medical College and Hospital, Ahmednagar, Maharashtra, India.

Abstract

Background: A common cause of morbidity in women is breast abscess. Breast abscesses are still an issue for women in developing nations, despite the fact that they are less common there due to improvements in maternal hygiene, nutrition, standard of living, and early antibiotic therapy. Use of sonography assisted procedure or traditional drainage of breast abscess is debatable. Hence, we conducted this study with primary end points of recurrence rate, resumption of lactation, residual abscess rates and healing time among both the groups.

Materials and Methods: Between August 2020 and March 2021, a comparative observational study was carried out on 80 patients of breast abscess. All female patients aged 14 and older who arrived to the surgical department with a breast abscess that had an ultrasound-measured diameter of up to 5 cm were included in the study. The study excluded patients with recurrent or chronic breast abscesses, necrotic skin overlaying the abscess, and abscesses that were already draining. Additionally, those with clinical indications of immunological suppression (WHO clinical stages III and IV) were excluded.

Results: Over all residual abscess rate was 25% in Group A and 7.50% in Group B and this difference was statistically significant. ($p < 0.05$) Of the 10 cases in Group A, 20% resumed the lactation and of the 12 cases in Group B, 91.67% resumed the lactation. The average time to heal among Group A was 13.92 days and among Group B was 5.33 days and this difference was statistically significant.

Conclusions: The recurrence rates, residual abscess rates and healing time was significantly higher among traditional incision and drainage method of treatment of breast abscess. Resumption of lactation was earlier among the sonography guided procedure.

Index Terms: Sonography; Breast Abscess; Surgical drainage

Introduction:

A common cause of morbidity in women is breast abscess.¹ Breast abscesses are still an issue for women in developing nations, despite the fact that they are less common there due to improvements in maternal hygiene, nutrition, standard of living, and early antibiotic therapy.^{2,3} The management of breast abscesses presents a challenging clinical issue. Incision and drainage are the traditional methods for treating breast abscesses, but they are also associated with the need for general anesthesia, extended healing times, regular dressing, difficulty breast-feeding, and potentially disappointing cosmetic results.^{2,4,5} Breast abscess recurrence rates are reported to be between 10 to 38%, despite the aggressive method of incision and drainage along with the administration of antibiotics. Repeated needle aspirations with or without ultrasound supervision is a treatment option for breast abscesses. In addition to helping with needle placement during aspiration and allowing for the detection of several abscess loculations, ultrasound has been demonstrated to be helpful in the diagnosis of breast abscesses. This surgery has a successful track record, is less likely to reoccur, produces outstanding cosmetic results, and is less expensive.²⁻⁴ In India, incision and drainage remain the most popular forms of therapy for breast abscesses. There is no information available to compare the effectiveness of surgical incision and drainage against ultrasound guided needle aspiration for the treatment of breast abscesses. This study's objective was to determine whether ultrasound-guided needle aspiration could be a viable alternative treatment for breast abscesses in our facility. The primary end points were recurrence rate, resumption of lactation, residual abscess rates and healing time among both the groups.

Materials and methods:

Between August 2020 and March 2021, a comparative observational study was carried out. All female patients aged 18 and older who arrived to the surgical department with a breast abscess [lactational and non-lactational] that had an ultrasound-measured diameter of up to 5 cm were included in the study. The study excluded patients with recurrent or chronic breast abscesses, necrotic skin overlaying the abscess, and abscesses that were already draining. Additionally, those with clinical indications of immunological suppression (WHO clinical stages III and IV) were excluded.

We calculated the sample size to be 40 in each group, taking into account the difference of 30% in healing rates between the ultrasonography-guided aspiration and the incision and drainage approach for breast abscesses. Therefore, 40 cases in each group were included in the current study. Based on the existence of breast pain, swelling, fever, and a fluctuating sensitive breast swelling, a clinical diagnosis was made. The radiology department performed an ultrasound scan on the patients who had been clinically

diagnosed using a high frequency linear transducer with a 7.5 MHZ frequency. The existence of a thick-walled echo complex mass, primarily cystic with internal echoes and septations, supported the diagnosis sonographically. The abscess' size was estimated. Breast abscesses were described as being resolved when there was no longer any sonographically detectable fluid collection, normal breast glandular and fibro fat tissue, or wound at the prior site of the abscess.

During follow-up visits, patients were obliged to bring their pill packs in order to verify that they had actually taken the medication. Lactating patients were instructed to resume breastfeeding on both breasts as soon as they could handle the discomfort while the infant breastfed on both arms. The lead researcher followed up with the patient at the OPD. Clinical evaluation of symptoms and signs was performed during the follow-up appointment to determine whether the abscess had healed. An ultrasound scan was performed to evaluate the abscess' radiological resolution, which was indicated by the absence of all fluid collection and the presence of normal breast glandular and fibrofatty tissues free of edema. At the subsequent session, the recurrence and acceptance of the breast abscess were evaluated. Patients were sent to the Breast outpatient clinic for additional follow-up if they had not completely resolved their breast abscess at the end of the research period.

Statistical analysis plan:

The data was collected, compiled, and analyzed using EPI info (version 7.2). The qualitative variables were expressed in terms of percentages. The quantitative variables were categorized and expressed in percentages or terms of mean and standard deviations percentages. The difference between the two proportions was analyzed using the chi-square or Fisher exact test. All analysis was two-tailed, and the significance level was set at 0.05.

Results:

We have included 40 cases in both the groups; Group A= Incision and drainage, Group B= ultrasonography guided aspiration

Table 1: Demographic particulars of both the groups

Demographic particulars	Group A		Group B		P value
	N=40		N=40		
	Number	%	Number	%	
Age*	36.40	10.27	34.22	8.03	0.5672
Lactating (Yes)	10	25.00	12	30.00	0.6754
Side of abscess					
Right	20	50.00	21	52.50	0.7822
Left	20	50.00	19	47.50	
Size of abscess* (cm ²)	4.67	1.12	4.88	2.18	0.1222

*Mean and Standard deviation have been considered

The mean age of the cases among both the groups was comparable. ($p>0.05$) Of the 40 cases in each group, 25% were lactating among Group A and 30% were lactating among Group B. The side of lesion was comparable in both the groups. The average size of abscess among Group A was 4.67 cm² and among Group B was 4.88 cm². ($p>0.05$)

Table 2: Distribution of the groups based on the residual abscess at 7th day follow up

Residual abscess	Group A		Group B		P value
	Number	%	Number	%	
Yes	10	25.00	3	7.50	0.0328
No	30	75.00	37	92.50	
Total	40	100.00	40	100.00	

Over all residual abscess rate was 25% in Group A and 7.50% in Group B and this difference was statistically significant. ($p<0.05$)

Table 3: Distribution of the groups based on the recurrence after 2 weeks

Recurrence after 2 weeks	Group A		Group B		P value
	Number	%	Number	%	
Yes	7	17.50	0	0	0.0042
No	33	82.50	40	100.00	
Total	40	100.00	40	100.00	

The recurrence rates among Group A and B were 17.50% and 0% respectively and this difference was statistically significant. ($p < 0.05$)

Table 4: Distribution of the groups based on the resumption of lactation

Resumption of lactation	Group A		Group B		P value
	n=10		n=12		
	Number	%	Number	%	
Yes	2	20.00	11	91.67	0.0031
No	8	80.00	1	8.33	

Of the 10 cases in Group A, 20% resumed the lactation and of the 12 cases in Group B, 91.67% resumed the lactation.

Table 5: Distribution of the groups based on the time to heal

Time to heal	Group A		Group B		P value
	n=40		n=40		
	Mean	SD	Mean	SD	
	13.92	4.55	5.33	2.33	<0.001

The average time to heal among Group A was 13.92 days and among Group B was 5.33 days and this difference was statistically significant.

Discussion:

Breast abscesses are a frequently seen clinical entity in daily practice.^{1,5} Acute mastitis can be treated conservatively with antibiotics when it is first diagnosed and at an early stage.⁶ Previously, the treatment for an abscess needed incision and drainage, but this was accompanied by the need for daily dressing, a lengthy healing period, concerns about continuing breastfeeding, an unsatisfactory cosmetic result, and a risk of recurrent breast abscess.⁷⁻⁹ Historically, this was the primary form of care, but with time and additional analysis, research, and clinical trials, it has become clear that minimally invasive techniques yield superior results and are more widely accepted. Due to its simplicity and success, ultrasound guided needle aspiration under antimicrobial treatment has evolved into the most recent

management protocol in many institutions. In light of this, we looked into the effectiveness of aspirating breast abscesses using ultrasonography as a guide.

During the course of the study, no recurrent abscesses were noticed in the ultrasound guided aspiration group. The group that underwent both an incision and an incision saw a 17.50% recurrence rate. In a research by Rigourd V et al.¹⁰, the time between the development of the abscess and the need for drainage was considerably longer for patients who ultimately required surgical drainage ($p=0.0031$). In a research by Colin C et al.¹¹, 49/105 (47%) of the 105 abscesses were recovered after the initial round of treatments, whereas 56/105 (53%) required more than one drainage, with a median number of drainages of 2.6 (2-6) In the surgical therapy group, 31% of patients developed recurring abscesses, whereas none did in the least invasive treatment group, according to Strauss A et al. In a research by Rigourd V et al.¹⁰, all patients who had been handled by needle aspiration remained nursing following the treatment, and 40% of the patients were still breastfeeding after 6 months. Our research reported similar conclusions.

The average healing time for the ultrasonography-guided group was 5 days, compared to 13 days for the incision and drainage group. In a study conducted by Chandika AB et al.¹², there was no statistically significant difference between the healing rates of the two groups overall or at each visit (Log rank: 0.24 df 1 P-0.63). In a research by Naeem M. et al.¹³, the ultrasonography guided group's mean healing time was noticeably shorter. In their study, a total of 93.3% of patients in the ultrasonography guided group and 76.6% of patients in the incision and drainage group experienced healing ($P = 0.033$).

Both studies' cost-effectiveness could not be compared. Because it was an observational study, the degree of evidence is still weak. Conducting randomized controlled studies in this area would result in more reliable data. However, the study's enormous sample size allowed it to prove that sonography-guided surgery is far superior to conventional incision and drainage.

Conclusions:

The recurrence rates, residual abscess rates and healing time was significantly higher among traditional incision and drainage method of treatment of breast abscess. Resumption of lactation was earlier among the sonography guided procedure. Hence, we conclude that sonography guided drainage is better approach than the traditional method.

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