Original Article

DOI: 10.17354/ijss/2016/211

Ultrasound-guided Percutaneous Aspiration of Breast Abscesses: An Outpatient Procedure

Anjali Pawar Dahiphale[1], Anita J Kandi[2], Prashant Titare[1], Varsha Rote Kaginalkar[3], Sarojini Jadhav[4]

[1]Associate Professor, Department of Radiodiagnosis, Government Medical College, Aurangabad, Maharashtra, India, [2]Associate Professor, Department of Surgery, Government Medical College, Aurangabad, Maharashtra, India, [3]Professor and Head, Department of Radiodiagnosis, Government Medical College, Aurangabad, Maharashtra, India, [4]Professor and Head, Department of Surgery, Government Medical College, Aurangabad, Maharashtra, India

Abstract

Introduction: Most breast abscesses occur as a complication of mastitis secondary to bacterial infection. Mastitis usually affects lactating women, but it can also occur in non-lactating women. Ultrasound-guided percutaneous aspiration of breast abscess is minimally invasive and dynamic procedure.

Aim and Objective: To evaluate the efficacy of ultrasound-guided percutaneous aspiration in treating breast abscess as an outpatient procedure.

Materials and Methods: Ultrasound-guided percutaneous aspiration of breast abscess done in our radiology department on Aloka prosound alpha 7 ultrasound scanner and clinical and ultrasound follow-up done. Repeat aspiration done if abscess present on follow-up. Data were statistically analyzed.

Results: Most common diameter was 3-5 cm and amount of pus aspirated was 41-70 ml. Maximum 2 aspirations were required. In our study, 90% patients were cured by ultrasound-guided needle aspiration. Treatment failure was reported in 10% cases.

Conclusion: Ultrasound-guided needle aspiration of breast abscess is safe, effective, easily available, patient-friendly outpatient procedure without the development of any cosmetic issue.

Key words: Breast abscess, Percutaneous needle aspiration, Ultrasonography

INTRODUCTION

Mastitis is the inflammation of breast tissue. Most breast abscesses occur as a complication of mastitis. Mastitis usually affects lactating women, but it can also occur in non-lactating women. A breast abscess is defined as localized infection with a collection of pus in the breast parenchyma. Bacteria can enter through a crack in the skin of the breast or a cracked nipple. Despite breast abscess becoming less common in developed countries, it has remained one of the leading cause of morbidity in women in developing countries.[1] The frequency of breast abscess is quite high in India, generally related to poor nutrition, standard of living. Non-lactating breast abscess is not as common in India as in the western countries. The conventional treatment of breast abscess is by surgical incision and drainage. This often requires hospitalization, general anesthesia, and regular post-operative dressing.[2] It is most expensive and placement of surgical drains are unpleasant.[3] In the era of cosmesis, minimally invasive, less painful, more conservative approach in the management of breast abscess by ultrasonography (USG)-guided percutaneous needle aspiration with antibiotic coverage is very feasible.[1,3-5]

Access this article online

www.ijss-sn.com

Month of Submission : 02-2016
Month of Peer Review : 03-2016
Month of Acceptance : 03-2016
Month of Publishing : 04-2016

Aim and Objective

To assess the efficacy of ultrasound-guided percutaneous aspiration of breast abscess as an outpatient procedure.

MATERIALS AND METHODS

In our prospective study, population analyzed was presented with mastitis who were referred to our

Corresponding Author: Dr. Anjali Pawar Dahiphale, Department of Radiodiagnosis, Government Medical College, Aurangabad, Maharashtra, India. Phone: +91-9325790053. E-mail: dranjalidahiphale@gmail.com

department for sonography with clinical suspicion of breast abscess. There were 30 patients with breast abscesses randomized for USG-guided percutaneous aspiration on an outpatient basis with antibiotic coverage and repeat aspiration if necessary during the period from March 2012 to December 2015. All patients were from the outpatient department. A detailed history was taken and clinical examination was done. Characteristic of breast swelling, size of swelling, duration, history of fever, past history, and current lactation history were noted. All the necessary investigations were done accordingly.

The procedure of ultrasound-guided percutaneous aspiration was explained in detail to the patient. Informed written consent was taken in every patient. Ultrasound imaging features of the lesion like the initial size with long axis diameter was taken. Whether the lesion was uniloculated or multiloculated with internal septation and echoes was noted. All breast abscesses smaller than 7 cm in diameter were managed by ultrasound-guided percutaneous aspiration with all aseptic precaution under local anesthesia of 2 ml 2% lignocaine. On USG, abscesses were round to oval or irregular predominantly anechoic lesions with internal echoes (Figure 1). They were either uniloculated or multiloculated with internal septations. Ultrasound-guided needle aspiration was performed using 18 G needle and 20 ml disposable syringe in each case (Figure 2) pus aspirated till the abscess cavity was collapsed (Figure 3). Amount of pus aspirated was recorded, and some aspirate was sent for culture and sensitivity. These patients were given oral amoxicillin and clavulanic acid 625 mg BD daily for 7 days. Follow-up ultrasound examination done in all cases USG-guided aspiration was repeated on third and consecutively on the 7th day if required and again follow-up was done on the 14th day. At every follow-up, a clinical assessment with USG was done to assess complete resolution of the abscess. If the abscess persisted after three aspirations till 14th day, it was considered as treatment failure and hence incision and drainage were advised.

The following information was recorded in the database for each patient, viz., age, parity, lactational status, ultrasound measurement and features, pus volume removed, number of aspirations required, pus culture, and healing time. Lactating patients were encouraged to continue breastfeeding from the affected and unaffected breast.

RESULTS

Distribution of patients according to signs and symptoms were done. All the patients were presented with painful swelling (100%). Only 14 patients were presented with fever (46.66%). Axillary lymphadenopathy was present in 5 (16.66%) patients. 15 patients (50%) were presented with the cracked nipple. Out of 30 patients, 27 were lactating (90%) and remaining 3 (10%) were non-lactating. There were 24 (80%) primigravida patients.

Failure was seen in three patients as two out of them developed skin changes and repeated collection even after 3 aspirations, and they had multiloculated abscesses.

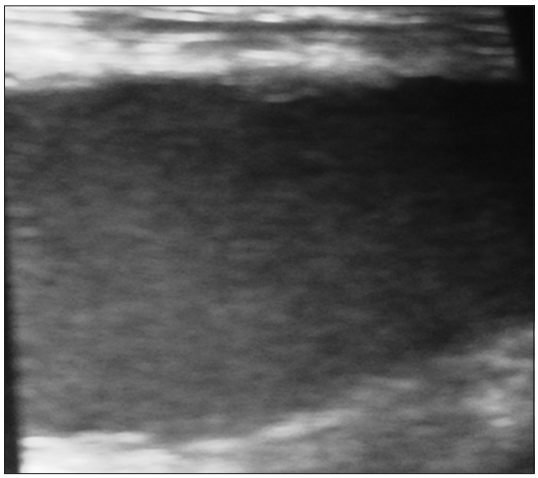

Figure 1: Image showing anechoic loculated collection with internal echoes in the breast

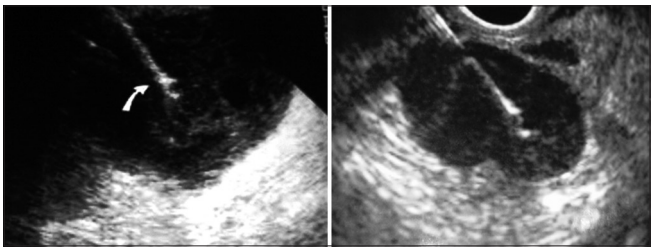

Figure 2: Ultrasound images showing breast abscesses with internal echoes and septations. Percutaneous aspiration needle is seen in the cavity of breast abscesses

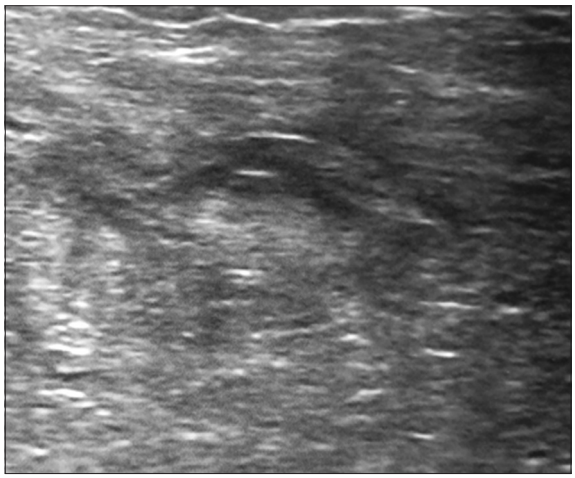

Figure 3: Ultrasound image showing collapsed abscess cavity after aspiration procedure

Remaining one patient was positive for tubercular breast abscess and shifted to antitubercular treatment.

In 25 patients (83.33%) pus culture was positive for *Staphylococcus aureus*.

Healing time approximately was 2 weeks for all cured patients. All patients were treated as outdoor patients. Only three patients from this group required hospitalization due to failure and underlying causes. Satisfaction rate was 100%, and no scar remained in all the patients.

DISCUSSION

The present study was carried out on the patient population with mastitis, who presented to the Department of Radiology between March 2012 and December 2015 for USG. There were total 30 patients with breast abscesses randomized for ultrasound-guided percutaneous aspiration. The mean age was 26 years which is correlated with the findings of Chandika *et al*., mean age 23.12 years.[6] In our study, 27 patients were lactating, i.e. 90% of the total patients were lactating and only 3 patients (10%) were non-lactating. All lactating patients (90%) continued breastfeeding in the treatment period satisfactorily and no milk fistula developed. The findings were correlated with Schwarz and Shrestha lactating (83%) and non-lactating (17%) while the study of Chandika *et al*., found 66.2% of lactating patients.[6,7] We found 9 (36%) patients with fever. Similar findings were found in the study of Sarhan *et al*., 12 patients (28%) out of 43 with fever.[8]

In our study, USG long axis diameter of the abscess ranged in size from 1.5 to 7 cm (average size 3.5 cm) (Table 1) correlated with findings of Christensen *et al*., (3.5 cm) and Chandika *et al*., (3.49 cm).[6,9] In our study, cure rate with one aspiration was in 10 patients (33.33%), two aspirations required in 14 patients (46.66%), and three aspirations required in 3 patients (10%) with failure in 3 patients (10%) (Table 4). In study of Sarhan *et al*., they mentioned cure rate with one aspiration in 23 patients (53.4%), two aspirations in 9 patients (21%), and three aspirations in 8 patients (18.6%) with failure in 3 patients (7%).[8]

In our study, pus volume ranges from 10 to 130 ml (avg 40 ml) (Table 2). Elagili *et al*., mentioned the volume range of 1-200 ml.[3] Leborgne and Leborgne observed the range of 1-225 ml with the initial aspiration of 28 ml.[10] *S. aureus* was the most common pathogen in 25 patients (83.3%) in our study which is correlated with Ulitzsch *et al*., (89%).[5] In our study, the cure rate was 90% (Table 5). Our results showed that most of the patients with breast abscesses (90%) can be treated with repeated aspirations (Table 3) with antibiotic coverage correlated with findings of Chandika *et al*., with cure rate (93.1%). Karstrup *et al*., (95%) and Sarhan *et al*., reported cure rate of 93% with antibiotic therapy.[6,8,11] Ulitzsch *et al*., reported cure rate of 97.67% and Elagili *et al*., mentioned cure rate 83% (Tables 1-5).[3,5]

In our study, no scarring was found and all patients continued breastfeeding (100%) correlated with the study of Saleem *et al*., and Ulitzsch *et al*.[1,5] They also found 100% results in their study. Eryilmaz *et al*., reported that

Table 1: Distribution of patients according to size of abscess

Size of abscess in cm	Number of patients (*n*=30)	Percentage
<3	5	16.66
3-5	20	66.66
5-7	5	16.66

Maximum number of patients were presented with size <5 cm

Table 2: Distribution of patients according to volume of pus

Volume of pus in ml	Number of patients (*n*=30)	Percentage
<20	4	13.33
20-40	10	33.33
41-70	12	40
71-100	2	6.66
>100	2	6.66

In most of the patients pus volume drained was <70 ml

Table 3: Healing time in number of patients

Duration of days	Number of patients (*n*=30)	Percentage
Up to 5	10	33.33
6-10	15	50
>10	5	16.66

Maximum Healing time required was upto 2 weeks

Table 4: Distribution of number of patients as per number of aspirations done

Number of aspirations	Number of patients (*n*=30)	Percentage
1 Aspiration	10	33.33
2 Aspirations	14	46.66
3 Aspirations	3	10
Failure	3	10

Most of the patients were cured with 2 aspirations

Table 5: Response to treatment

Number of patients	Cured with respective treatment (%)	Recurrence/ failure (%)	Tuberculous breast abscess (%)
30	27 (90)	2 (6.66)	1 (3.33)

Failure was seen in 6.6% patients

the risk factor for failure of needle aspiration of breast abscess was abscess size more than 5 cm.[12] We also found failure in 2 (6.66%) patients with abscess size >5 cm with multiloculation. One patient was positive for tuberculous breast abscess was shifted to antituberculous treatment. Healing time was 2 weeks consistent with finding of Chandika *et al*., and Strauss *et al*.[6,13] All 27 patients (90%) in our study treated on outpatient basis consistent with study of Christensens *et al*., 77 patients (87%).[9] USG-guided aspiration of breast abscess is very cost effective treatment as it is outpatient procedure without hospitalization and no general anesthesia and repeated dressing required consistent with findings of Chandika *et al*., (93.11%).[6] No breast abscess recurrence was observed in all cured patients. The procedure is highly accepted by all the patients with 100% satisfaction consistent with study of Ulitzsch *et al*., and Christensen *et al*.[5,9]

CONCLUSION

USG-guided percutaneous aspiration of breast abscess represented a minimally invasive, simple outpatient department procedure without the need of general anesthesia with superior cosmetic results, high satisfaction rate in lactating, and non-lactating women. It is very promising, feasible, and efficient alternative method of treatment to conventional incision and drainage in properly selected patients.

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How to cite this article: Pawar Dahiphale A, Kandi AJ, Titare P, Kaginalkar Rote V, Jadhav S. Ultrasound-guided Percutaneous Aspiration of Breast Abscesses: An Outpatient Procedure. Int J Sci Stud 2016;4(1):169-172.

Source of Support: Nil, **Conflict of Interest:** None declared.