



TO STUDY THE ULTRASOUND-GUIDED PERCUTANEOUS ASPIRATION IN LACTATIONAL BREAST ABSCESSES IN SOUTH INDIAN STUDY

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ABSTRACT

Breast abscess is a common cause of morbidity in women. While they are less common in developed countries as a result of improved maternal hygiene, nutrition, standard of living and early administration of antibiotics, breast abscess remain a problem among women in developing countries. The following were the aims and objective of this study. 1. To establish the role of ultrasound-guided percutaneous aspiration of breast abscess as a treatment modality in lactational breast abscess, To establish role of ultrasound as a diagnostic modality in localization of residual lactational breast abscess and to formulate the outcome of intervention/procedure after overall outcome of the present study. The present, observational study was conducted on 30 patients with clinically diagnosis of lactation breast abscess in the Postgraduate Department of Surgery, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry. Needle aspiration is simple to carry out and is well tolerated by patients. Patients do not require hospitalization, and clinical improvement is rapid. In the present study in every case, ultrasound imaging revealed the fluid collection. The percutaneous procedures used in the treatment of breast abscesses do not produce any cosmetic alterations, and the results obtained are satisfactory. There is no need for general anesthesia or operation, and no in-hospital stay, and postoperative dressings and discomfort after aspiration therapy are minimal. There is also a low occurrence of the troublesome milk fistulae that often follows incision and drainage. This technique should become the standard of practice in the management of breast abscesses. US-guided needle aspiration is a minimally invasive therapy in combination with antibiotics is found to successfully treat most breast abscesses. Advantages of ultrasound-guided aspiration: The results indicate several advantages associated with ultrasound-guided aspiration, including shorter healing times, lower rates of residual abscesses, no recurrence after two weeks, higher rates of lactation resumption, and minimal scarring. These findings suggest that ultrasound-guided aspiration may offer superior outcomes compared to the traditional incision and drainage approach. Clinical implications: The study underscores the clinical implications of adopting ultrasound-guided aspiration as a minimally invasive and effective method for managing breast abscesses

Keywords :- Abscess, benign, breast, needle aspiration, ultrasound-guided, Aspiration, Breast, Fistula, Percutaneous.

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INTRODUCTION

Percutaneous ultrasound (US)-guided aspiration is the first line of management for breast abscess. Our study aimed to look at the success of US-guided percutaneous drainage in managing breast abscesses at a tertiary care center and additionally to look for any

correlation between US features and failure rate. Breast abscess is a common cause of morbidity in women. While they are less common in developed countries as a result of improved maternal hygiene, nutrition, standard of living and early administration of antibiotics, breast

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abscess remain a problem among women in developing countries (Ioannis H and Nigel JB, 2002). Lactational breast abscess is an accumulation of pus in an area of the breast and frequently develops as a result of inadequately treated infectious mastitis (Dener C and Inan A, 2003). Between 5 and 11% of lactating women with infectious mastitis will develop a breast abscess, which usually occurs at 3 to 8 weeks postpartum. The causative agent is typically *Staphylococcus aureus* which enters the breast tissue through a milk duct or crack in the nipple. Risks for developing breast abscess include primiparity, birth after 41 weeks' gestation, age >30 years, and recent mastitis (Preece PE, 1982; Ulitzsch D, Nyman MKG, Carlson RA, 2004; Kvist LJ and Rydhstroem H, 2005).

Breast abscesses are a complication of mastitis, and a pyogenic abscess can evolve from acute bacterial mastitis if treatment with antibiotics is not successful. Breast abscesses are more frequently observed in nonpuerperal mastitis than in puerperal mastitis, and can be a particularly

difficult condition due to the intense discomfort and tendency for recurrence. When an abscess is small and located deep within the breast, it can be clinically difficult to detect and differentiate from mastitis (Hayes et al., 1991).

Clinical presentation of lactational breast abscess usually includes fever, chills, malaise, and recent or recurrent mastitis. Pain, erythema, and firmness over an area of the breast are typically present. However, a mass is not always palpable, especially if it is located deep within a large breast. Diagnosis is made via signs and symptoms, physical examination, and ultrasound (Kvist LJ and Rydhstroem H, 2005). While US-guided aspiration of breast abscesses is a common practice worldwide, it is rarely practiced in the developing world. To date, there are limited studies on this practice in our settings.

AIM OF THE STUDY

The following were the aims and objective of this study. To establish the role of ultrasound-guided percutaneous aspiration of breast abscess as a treatment modality in lactational breast abscess, to establish role of ultrasound as a diagnostic modality in localization of residual lactational breast abscess and to formulate the outcome of intervention/procedure after overall outcome of the present study.

MATERIAL AND METHODS

The present, observational study was conducted on 30 patients with clinically diagnosis of lactation breast abscess in the Postgraduate Department of Surgery, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry. The size of the abscess varied from 2 to 8

cm. All the patients were lactational mothers. Pain over an area of breast was present in all the patients. Discharge was present in 20 (66.67%) patients. All were given antibiotic cover against other infections. They were subjected to ultrasonography-guided percutaneous aspiration of breast abscess thrice during a period of one week.

RESULTS AND DISCUSSION

Breast abscesses are commonly encountered in routine practice by healthcare providers ranging from primary care physicians to breast surgeons. Early recognition and prompt treatment are imperative to minimize morbidity. It is therefore essential that all potential providers are well-aware of contemporary approaches or best practices for the management of breast abscesses. The treatment involves drainage of the purulent material along with antibiotic coverage. Conventionally, surgical incision and drainage were common practice. In recent years, percutaneous needle aspiration, with or without ultrasound (US) guidance has superseded surgical drainage. Current recommendations include image-guided aspirations as the first line with surgical drainage being reserved for non-resolving abscesses or those presenting with necrotizing signs

The present, observational study was conducted on 30 patients with clinically diagnosis of lactation breast abscess in the Postgraduate Department of Surgery, Sri Lakshmi Narayana Institute of Medical Sciences. The size of the abscess varied from 2 to 8 cm. All the patients were lactational mothers. Pain over an area of breast was present in all the patients. Discharge was present in 20 (66.67%) patients. All were given antibiotic cover against other infections. They were subjected to ultrasonography-guided percutaneous aspiration of breast abscess thrice during a period of one week. Following observations were made during the course of the study.

1: Age distribution of patients: Most patients were in the age group of 23 – 25 years (36.67%), followed by 20 – 22 and 26 – 28 years (23.33% each) and 29 – 31 years (16.67%). Mean age \pm standard deviation of the patients was 24.96 ± 2.90 years with a range of 20 to 31 years. Mean age \pm standard deviation (range) = 24.96 ± 2.90 (20 – 31) years.

2: Parity distribution of patients (n=30) : Most of the patients were para 1 (56.67%), followed by para 2 (36.67%) and para 3 (6.66%).

3: Distribution of patients according to duration of symptoms (n=30): Half of the patients presented after symptoms persisted for 11 to 15 days (50%), followed by 16 to 20 days (26.67%), >21 days (13.33%) and <10 days (10%). Mean duration of symptoms \pm standard deviation

was 15.46 ± 4.04 days with a range of 8 to 21 days. Mean duration of symptoms \pm standard deviation (range) = 15.46 ± 4.04 (8 – 21) days.

4: Distribution of patients according to size of abscess (n=30): Abscess with a size of 4 cm was seen in most patients (20%), followed by size of 5 cm (16.67% each), size of 2, 3 and 7 cm (13.33% each) and size of 8 cm in 6.67% patients. Mean size of abscess \pm standard deviation was 4.76 ± 1.81 with a range of 2 to 8 cm Mean size of abscess \pm standard deviation (range) = 4.76 ± 1.81 (2 – 8) cm.

5: Distribution of patients according to quantity of pus (n=30): In 20% patients each, quantity of pus was <20 ml, 21 – 30 ml, 31 – 40 ml and 41 – 50 ml respectively. In 13.33% patients, quantity of pus was 51 – 60 ml and in 6.67% patients, it was >61 ml Mean quantity of pus \pm standard deviation (range) = 39.33 ± 18.55 (10 – 90) ml.

6: Distribution of abscesses according to quadrant and side involved: There were 31 quadrants involved for 30 abscesses in the study. There were 18 on the left side and 13 on the right. One abscess of 5 cm size stretched from inferolateral to superolateral on the left side, thereby involving two quadrants. Superolateral quadrant left and right side was the most involved with 13 (41.94%) abscesses, which included 8/18 (44.44%) on the left side and 5/13 (38.46%) on the right side. Superomedial quadrant was more involved on the right side (38.46%), while inferolateral quadrant was more involved on the left side (22.22%) and inferomedial quadrant also was more involved on the left side (16.67%).

Patients in our study who presented with a breast abscess showed that most of them can be effectively managed by US-guided aspirations. We did not identify any US imaging features that could predict the success or failure of US-guided percutaneous aspiration. Breast abscesses are a common finding in puerperal women. This may be due to predisposing factors such as mastitis and the proliferation of glandular tissue in the breast which commonly occurs during lactation. A majority of patients in our study had lactation-associated breast abscesses which are consistent with previous reports. For breast abscesses showing non-resolution after the first aspiration attempt, repeated US-guided aspirations can be done. The traditional management of lactational breast abscesses has been I&D in both high and low-income countries. However, recent evidence suggests good outcomes with percutaneous aspiration with or without US guidance. A recent study reported success rates of 96% with US-guided percutaneous aspiration regardless of abscess size data

published previous studies showed that with repeated aspirations, there are success rates of 24% with a single aspiration, 32% with two, and 46% with three aspirations. We successfully managed with US-guided percutaneous aspirations in 75% of our cohort, despite late presentation possibly due to the cultural stigma attached to breast diseases.

Breast abscesses constitute a significant clinical/surgical problem because of the significant associated patient discomfort and the tendency towards recurrence. Breast abscesses are observed more often in lactating women. Patients with breast abscesses are commonly seen in the Emergency Department. The traditional treatment of breast abscesses is by surgical incision and drainage, digital disruption of the septations, complete evacuation of abscess contents, with or without the placement of surgical drains. Appropriate systemic antibiotic coverage should also be used. Despite adequate surgical drainage, between 10% and 35% of abscesses recur and require additional drainage procedures.

Frequently, the surgical drainage paradigm necessitates general anesthesia, may lead to unpleasant scar formation, is more expensive than aspiration, and often calls for regular postoperative dressing changes. Moreover, surgical drainage of breast abscess may interfere with lactation. Needle aspiration of the purulent material in breast abscesses has been reportedly performed with or without ultrasound guidance. It was first suggested in the 1920's that breast abscesses can be successfully treated with percutaneous needle aspiration. Today, high-resolution, real-time, hand-carried ultrasonography allows surgeons to perform directed bedside drainage of breast abscesses, often irrespective of the total abscess volume and/or size.

In the present study, patients presented were from age group 20 to 31 years and most patients were in the age group of 23-25 years with mean age of 24.96 years, which is similar to the study conducted by Dixon JM (1988) in which six women aged 24-32 with mean age 27 years presented three to eight weeks postpartum with a breast abscess. The present study is also similar to the study conducted by Chandika AB, Gakwaya AM, Kiguli-Malwaddle E, et al. (2012) in which the mean age was 23.12 years.

In the present study, most of the patients were para 1 (56.67%), which is similar to study conducted by Chandika AB, Gakwaya AM, Kiguli-Malwaddle E, et al. (2012) in which most of them were lactating primiparous patients. Kvist LJ and Rydhstroem H (2005) concluded in their study that primiparous women appear to be at a greater risk for the development of breast abscess during lactation than multiparous women. Also, in the present study, in 19 patients in whom abscess was resolved, 11 (57.89%) were primipara and 8 patients (42.11%) were multipara.

Several studies have reported shorter resolution time with needle aspiration compared with I&D and less scar formation, though there was a higher failure rate in the aspiration group compared to open drainage. Despite the potential need for repeat intervention, patients may prefer minimally invasive percutaneous aspirations due to early resumption of breastfeeding, improved cosmesis, less pain, and no hospitalization. Patients who undergo I&D may develop psychological anxiety due to post-operative scar formation and deformity of the breast, with one report showing patient dissatisfaction rates of 70%. In addition to this, these patients need daily dressing of the abscess cavity which is painful and also leads to an extra financial burden.

In our study, size of abscess varied from 2 to 8 cm, which is similar to the study conducted by Kielar M, Raczek-Pakula K, Waligora J, et al. (2009), in which ultrasonographic examinations confirmed the presence of typical image of an abscess, from 3.3 to 8.2 cm in diameter. Also, in the present study, size of abscess (in cm) in patients in whom abscess got resolved was less as compared to those in whom abscess did not get resolved which is similar to the study conducted by Hook GW and Ikeda DM (1999), who concluded that percutaneous aspiration of breast abscesses can enable diagnosis of abscesses and be used to treat small abscesses if they are completely drained. Eryilmaz R, Sahin M, Hakan Tekelioglu M, et al. (2005) concluded in their study that breast abscesses smaller than 5 cm in diameter on physical examination can be treated with repeated aspirations with good cosmetic results. Incision and drainage should be reserved for use in patients with larger abscesses. Ozseker B, Ozcan UA, Rasa K, et al. (2008) observed that this method is more successful in abscesses with a maximum dimension smaller than 3 cm. Chandika AB, Gakwaya AM, Kiguli-Malwaddle E, et al. (2012) found that ultrasound-guided needle aspiration is a feasible and cost effective treatment option for both lactating and non-lactating breast abscesses with a diameter up to 5 cm by ultrasound in an immune competent patient. Suthar KD, Mewada BN, Surati KN, et al. (2013) however concluded in their study that there was high failure rate of aspiration therapy in abscesses with >5 cm size on ultrasonography.

In the present study, amount of pus varied from 10 ml to 90 ml. Abscesses resolved in cases where the amount of pus was less which is similar to the study conducted by Schwarz RJ and Shrestha R (2001) which observed that those patients in whom needle aspiration was successful had a significantly smaller volume of pus on initial aspiration (4.0 mL versus 21.5 mL).

In our study, the superolateral quadrant of left breast was more involved (44%) as compared to other quadrants, which is similar to study conducted by Elagili F, Abdullah N, Fong L, et al. (2007) in which 9 (30%)

lesions were in the upper outer quadrant of the left breast. Chandika AB, Gakwaya AM, Kiguli-Malwaddle E, et al. (2012) found that abscesses were located in the upper lateral quadrant (56%).

Studies have suggested a higher failure rate for abscesses treated with aspiration in the presence of skin necrosis, centrally located abscess, multi-loculation, and non-lactational abscess, however, the exact value of their predictive nature is not well established. None of our patients in the US-guided aspiration cohort had necrosis as it is likely that such patients were taken for surgical drainage. Not much difference in percentage was found between the lactational and non-lactational groups. The most common organism causing breast abscess in our study was *Staphylococcus aureus* (65%), consistent with previous reports, though methicillin-resistant *S. aureus* (MRSA) was not detected in any of our samples, unlike other reports. Thus, early recognition and prompt initiation of antibiotic therapy against *S. aureus* are important. The available clinical studies suggest that the percutaneous US-guided NA, a minimally invasive technique, is associated with a shorter mean healing time and mean duration of hospital stay, higher success rate, acceptable cosmetic results, minimal effects on breastfeeding, acceptable patient satisfaction, and emotional stability among patients with breast abscesses.

CONCLUSION

The size of the abscess varied from 2 to 8 cm. All the patients were breast feeding and pain over an area of breast was present in all the patients. Discharge was present in 20 (66.67%) patients. Antibiotic cover was given to all patients against other infections. Most patients were in the age group of 23 – 25 years (36.67%). Mean age of the patients was 24.96 with a range of 20 to 31 years. Most of the patients were para 1 (56.67%), followed by para 2 (36.67%) and para 3 (6.66%). There was no significant difference between primipara and multipara patients in resolution of abscess. 2. Mean duration of symptoms was 15.46 with a range of 8 to 21 days. Mean size of abscess was 4.76 with a range of 2 to 8 cm and mean amount of pus in 30 patients was 39.33 ml. Mean size of abscess was significantly less in whom resolution was observed ($p < 0.0001$). 3. There were 31 quadrants involved for 30 abscesses in the study, 18 on the left side and 13 on the right. Inferolateral quadrant left and right side was the most involved with 13 (41.94%) abscesses. 4. Causative agents like *Streptococcus aureus*, *S. spp.* and *Escherichia coli* were responsible for abscess in 28, 2 and 3 patients respectively. 5. Mean size of abscess reduced to 3.44 cm from baseline size of 4.76 cm after 1st aspiration. The difference was statistically highly significant ($p = 0.009$). Mean size of abscess significantly reduced to 2.97 cm after 2nd aspiration ($p = 0.002$). Mean size of

abscess significantly reduced to 2.78 cm after 3rd aspiration ($p=0.004$). 6. The success rate of resolution was 63.33%. Seventy-five percent of our breast abscess patients selected and referred for US-guided percutaneous abscess aspiration were able to avoid surgery with the majority requiring only a single aspiration.

Lower morbidity and higher patient satisfaction rates with percutaneous aspiration make it an essential

consideration in the treatment algorithm. Incision and drainage with its associated deformity and higher morbidity should be deferred in favor of the minimally invasive approach when possible. Though our study is limited by the small sample size and failed to identify factors predictive of failure of percutaneous aspiration treatment, it may be worth exploring in future studies. Antibiotics, especially with coverage for *S. aureus*, must be commenced early.

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