

Advantages of Ultrasound Guided Aspiration of Breast Abscess in Comparison To Incision and Drainage

¹Emad Abdellatif Daoud M.D and ²Dahlia M. Dalam, M.D

¹Departments of General Surgery, ²Radiology,
Faculty of Medicine, Ain Shams University, Egypt

ABSTRACT

Background: Management of breast abscess involves incision and drainage; however, this invasive approach is associated with a high rate of complications. Ultrasound guided aspiration has emerged as an alternative to surgical drainage due to its ability to recognize a multiloculated abscess, assess the adequacy of drainage and the possibility of ruling out simple mastitis. We aim to compare between the incision and drainage and ultrasound-guided aspiration for the treatment of breast abscesses. **Patients and Methods:** forty –eight patients attended private hospital in Jeddah during a period from April 2011 to August 2015, were divided into two groups: Group (1) (US-guided needle aspiration) and group (2) (incision and drainage), each group was 24 patients .Incision and drainage was done under general anesthesia, whereas US-guided aspiration was done under local anesthesia with antibiotic coverage after the pus sample was taken for culture and sensitivity. Failure rate of procedure, a rate of healing and complications were recorded, follow-up of patients done for 6 weeks. **Results:** Group (1) show failure rate was 3/24(12.50%) and these patients underwent surgical operation, low incidence of milk fistulae 1 patient (4.16%), and better cosmetic appearance. While group (2) shows failure rate was 1 patient (4.16%) who underwent excision as chronic abscess, 4/24 patients (16.66%) show milk fistulae which necessitate cessation of breast feeding and unpleasant cosmetic appearance. **Conclusion:** Ultrasound-guided aspiration of breast abscesses is a better modality of treatment of breast abscess than incision and drainage. **Key words:** Breast, abscess ultrasonography; US-guidance, incision, and drainage.

INTRODUCTION

The treatment of breast abscesses poses a difficult clinical problem^[1]. Traditionally management of breast abscess involves an incision and drainage; however this is associated with a need for general anesthesia, prolonged healing time, regular dressing, difficulty in breast feeding, and possible unsatisfactory cosmetic outcome^[2]. Ultrasound has been shown to be useful in the diagnosis of breast abscesses, guiding needle placement during aspiration and also enables visualization of multiple abscess loculations [3, 4]. Breast abscesses can be treated by repeated needle aspiration with ultrasound guidance instead of surgical option ^[5,6]. This procedure has been used successfully and was associated with low recurrence and excellent cosmetic result [7]. The aim of this study was to compare between the incision and drainage and ultrasound-guided aspiration for the treatment of breast abscesses.

PATIENTS AND METHODS

During the period from April 2011 to August 2015, data of forty –eight patients with mean age of 33 years(range18–48years),attended the surgical department at a private hospital in Jeddah, KSA with a clinical diagnosis of breast abscess. Thirty-four lactating women and fourteen non-lactating women were recorded. Approval to carry out research was obtained from Research and ethical Committee of the hospital. The patient's diagnosis was based on symptoms and signs of breast abscess (breast pain, breast induration, redness, nipple discharge, and general signs of inflammation). These symptoms and signs were associated with a tenderness which was encountered in all cases. The patients were referred to the ultrasound Unit for confirmation of the diagnosis of breast abscess .Initial ultrasound examination was done using Logic E9 from GE (General Electric) USA and using a high frequency linear probe 5-12 MHz .The ultrasound criteria for the diagnosis of breast abscess as, presence of a non-vascular hypochoic collection

mostly multiloculated, with posterior acoustic enhancement due to the fluid content and peripheral rim of vascularity were included. All abscesses contained debris and ranged in size from 1.2 to 8.0 cm (mean size, 4.6cm). After the diagnosis of breast abscess was confirmed, the patients were then divided into two groups (1) and (2) with 24 patients in each group. Patients with a group (1), underwent percutaneous ultrasound-guided needle aspiration. After the procedure explained to the patient, a written consent obtained, and sterilization of the overlying area of skin was done, followed by injection of local anesthesia using 10-ml 1% lignocaine usually using a 23 G needle. Under US guidance and free hand technique a 16 G needle was advanced into the abscess cavity under direct vision. A 20 -ml syringe was used to aspirate the fluid contents of the abscess till complete drainage. The amount of the aspirate was calculated and a sample was sent to the laboratory for cytology, culture and sensitivity. The mean time of every single procedure (considering disinfection, aspiration, and dressing) was 16 minutes ,ranged from 11 to 31 min. Lactating patients were advised to resume breast-feeding on both breasts as soon as possible as they could tolerate the pain. Post procedure ultrasound scan was done to assess radiological resolution of the abscess which was defined as complete absence of fluid collection, normal breast glandular and fibro-fatty tissues without edema. The patient's follow-up was done at the OPD by the clinical and US imaging on first, second, fourth and sixth weeks. In a situation where there was a persistent abscess, re-aspiration was to be done. Mammography was performed to exclude underlying malignancy in a case of residual persistent mass after the US-guided aspiration. Patients with a group (2) underwent open surgical drainage under general anesthesia. The abscess samples were sent for culture and sensitivity as well as cytology .Daily dressing with packing gauze was done till the resolution of sign and symptoms with ultrasound evidence and complete healing of wound as an end point of management. All patients were encouraged for breastfeeding on opposite site with an expression of milk on the same side.

Statistical Methodology and Analysis:

Analysis of data was done by IBM computer using SPSS (statistical program for social science version (16) as follows:

Description of qualitative variables as number and percentage
 $p > 0.05$ insignificant
 $P < 0.05$ significant
 $P < 0.001$ highly significant

Abstract



Fig. (1): Acute abscess; well-defined hypoechoic cystic breast mass with posterior acoustic enhancement denoting fluid content with echogenic debris inside (likely pus).

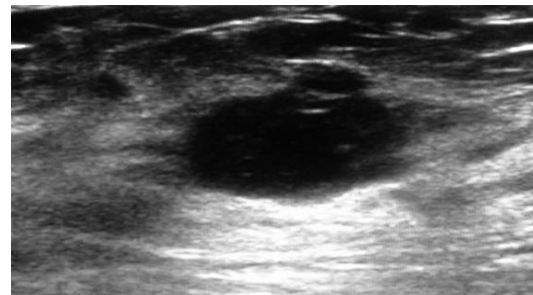


Fig. (2): Chronic abscess with thick walls and residual echogenic fluid collection and good through transmission.

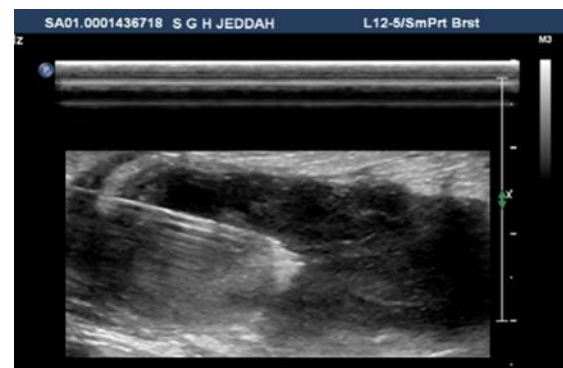


Fig. (3): Ultrasound guided drainage of a breast abscess with the needle in place

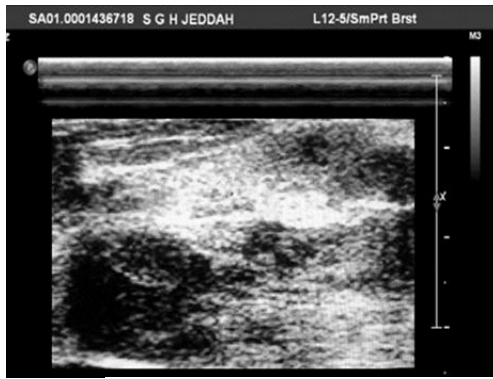


Fig. (4): Post Ultrasound guided aspiration of breast abscess with collapsed cavity

RESULTS

During the period from April 2011 to August 2015, forty-eight female patients with mean age 33 years (range 18–48years), 34 lactating women and 14 non-lactating women with a clinical and radiological diagnosis of breast abscess attended, at a private hospital in Jeddah, KSA. The patients were then divided into two treatment groups .Group (1) and group (2) with 24 patients in each group .Patients with a group (1), underwent ultrasound guided aspiration. Fifteen patients were completely cured with complete drainage of breast abscess after the single US guided aspiration with a success rate of 62.50 % (15/24).None of these abscesses need more required re-aspiration. The other 9 patients had large multiloculated abscesses and had substantial residual fluid after aspiration. Follow-up US examinations were performed at 1, 2, 4 and 6weeks. These remnant abscesses underwent repeated drainage procedures until a complete resolution was observed in 6 patients at clinical and US examination. During the serial US examinations a progressive decrease of the volume of aspirated purulent material and size of the fluid collection with decrease of the hypochoic internal structure was observed until final restoration of the breast tissue.3 patients (3/24) (12.50 %) completely re-aspirated on the 1st visit, 3 patients (3/24) (12.50%) underwent complete aspiration in the second visit. The treatment was successful in 21 patients out of 24 patients (87.50 %) with complete clinical and US resolution within 1 to 3weeks (median 2 weeks) as shown in the table (1). There were 3 patients out of 24 patients with failure of US-guided

aspiration (12.50%).2 patients out of 24 patients (2/24) (8.33%) with failed re-aspiration in 4th and 6th week underwent mammography and breast US to exclude the presence of impalpable mass, and then underwent surgical excision of a chronic abscess. One patient underwent immediate surgical incision and drainage due to a rapid increase in size as a result of post procedure bleeding. In all these patients underwent surgical incision and drainage, tissue biopsy was done and sent for histopathological diagnosis.

Table (1): Shows times of aspiration need to achieve complete resolution

<i>No of aspirations</i>	<i>Frequency no</i>	<i>Percent</i>
Frist aspiration	15	62.50%
Second aspiration	3	12.50%
Third aspiration	3	12.50%
Total	21	87.50%

As shown in the table (2), the failure rate was statistically insignificant difference between 2 groups. For group (1) was (12.50 %) with three patients requiring conversion to open surgical drainage after aspiration while in a group (2) failure rate is 1 patient (4.16%) who complain of persistent mass post incision and drainage and underwent excision as a chronic abscess. Milk fistula was major Complication which appears in group (1) as 1 patient (4.16%) while in group (2) was in 4 patients (16.66%) warranted for cessation of breast feeding which is statistically insignificant also.

Table (2): Showing complications of surgical treatment and US guided treatment

	<i>Group 1 US guided aspiration</i>	<i>Group 2 Incision and drainage</i>	<i>P value</i>
Failure rate	3 (12.50%)	1(4.16%)	0.23NS
Milk fistula	1(4.16%)	4(16.66%)	0.14NS

In this study, healing was achieved when clinically no breast tenderness, no swelling or wound at the previous site of the abscess and sonographically complete absence of fluid collection, normal breast glandular and fibro-fatty tissue with no edema. In group (1) healing rate is faster than group (2) as 21/24 patients (87.5%) healed until end of 4th week while in a group (2) 19/24 patients (79.16%) healed until the end of

4th week and 23/24(95.83%) healed until end of 6th week with insignificant difference statistically.

Due to delayed healing, patients in group (2) complained of an ugly scar, daily change of

dressings, especially packing of a wound, as painful and cumbersome.

Table (3): Shows healing rate in both groups

<i>Study group</i>	<i>Group 1</i>	<i>Group 2</i>	<i>X2</i>	<i>P value</i>
1 st visit (1 st week)	1 (4.16%)	2 (8.33%)	2.3	0.34NS
2 nd visit(2 nd week)	11(45.83%)	9 (37.50%)		
3 rd visit(4 th week)	9 (37.50%)	8(33.33%)		
4 th visit (6 th week)	0	4 (16.66%)		

Discussion In case of breast disease management, care should be taken to ensure that its beauty is minimally compromised in order to preserve its value and function⁽⁸⁾. Treatment of breast abscess traditionally has been incision and drainage, however this has been found to be associated with need of general anesthesia, Difficult in breast feeding, prolonged healing time, and regular dressing^(9,10).

Possible unsatisfactory cosmetic outcome including scarring with nipple retraction, hypertrophic scar and keloid are also major drawbacks of surgical drainage of breast abscess^(10,11). The possibility of using sonographically guided percutaneous aspiration has emerged as a valid alternative to surgical drainage due to ability to recognize a multiloculated abscess, assess the adequacy of drainage and the possibility of ruling out simple mastitis⁽¹²⁾. Karstrup et al⁽¹³⁾ first reported the successful use of this technique in 1990, soon followed by other investigators⁽¹³⁾.

The benefits for the patient underwent US needle aspiration are too many as there is no need for general anesthesia, no in-hospital stay, with no requirement for postoperative dressings, minimal discomfort after aspiration and avoids unsightly scarring in the breast^(14,15). There was also a low occurrence of the milk fistulae that often follows incision and drainage⁽¹⁶⁾. Our study has shown that a high rate of success was achieved with (87.50 %) in patients completing treatment, In comparison to other studies, Sarhan et al⁽¹⁷⁾ and Chandika et al⁽¹⁸⁾ reported the cure rate of 93%, .Schwarz et al⁽¹⁹⁾ reported cure rate of 82%, Christensen et al⁽²⁰⁾ and Berna et al⁽²¹⁾ reported cure rate of 82%). O'Hara et al⁽²²⁾ reported 85% cure rate in his study while Hook et al⁽²³⁾ reported a 54% cure rate breast abscesses treated

by aspiration and irrigation^(22,23). Healing rate of the two groups had no statistically significant difference in both overall and at each visit this was similar with what was found elsewhere⁽¹⁾. This similarity in the healing rate between the two treatment option could be explained by the fact that regardless of the way pus is removed from the cavity (incision and drainage-US guided aspiration) the healing process is the same which is by collapse of the cavity wall and adherence to one another by fibrin, later by granulation tissue⁽²⁴⁾.

Still there is debate against aspiration of breast abscesses is that these abscesses are frequently multiloculated, this may be one reason why multiple aspirations are required and it is mainly cause for failure and recurrence⁽²⁵⁾. Many authors consider it is essential to perform trucut biopsy in persistent palpable masses unresolved by percutaneous drainage and seen on US imaging and mammography in patients above 35 years of age to prevent missing a malignancy^(2,18).

CONCLUSION

Our study confirms that, low rate of complications, high rate of success and the optimal compliance observed in all patients are advantages of US guided. So ultrasound guided needle aspiration is a feasible alternative treatment option for breast abscesses in comparison to surgical drainage.

REFERENCES

1. Dener C, Inan A. Breast abscesses in lactating women. *World J Surg.* 2003; 27(2):130–133.

2. Bharat A, Gao F, Aft RL. Predictors of primary breast abscesses and Recurrence. *World J Surg.*2009;33(12):2582–2586.
 3. Berens PD. Prenatal, intrapartum, and postpartum support of the lactating mother. *Pediatr Clin North Am.*2001; 48(2):365–375.
 4. Kvist LJ, Rydhstroem H. Factors related to breast abscess after delivery: a population-based study. *BJOG.*2005;112(8):1070–1074.
 5. Rizzo M, Peng L, Frisch A. Breast abscesses in nonlactating women with diabetes: clinical features and outcome. *Am J Med Sci.* 2009;338(2):123–126.
 6. Hayes R, Michell M, Nunnerly HB. Acute inflammation of breast—the role of breast ultrasound in diagnosis and management. *ClinRadiol.* 1991;44(4):253–256
 7. Osterman KL, Rahm VA. Lactation mastitis: bacterial cultivation of breast milk, symptoms, treatment, and outcome. *J Hum Lact.* 2000; 16(4):297–302.
 8. Smriti A, Manju V, Vatsla DA. Comparison of cabbage leaves vs. hot and cold compresses in the treatment of breast engorgement. *Ind J Comm Med.* 2008; 33(3):160–162
 9. Imperiale A, Zandriono F, Calabrese M, et al. Abscesses of the breast: US-guided serial percutaneous aspiration and local antibiotic therapy after unsuccessful systemic antibiotic therapy. *ActaRadiol.* 2001;42(2):161–165.
 10. Ulitzsch D, Nyman MK, Carlson RA. Breast abscesses in lactating women: US-guided treatment. *Radiology.* 2004;232:904–909.
 11. Cantlie HB. Treatment of acute puerperal mastitis and breast abscess. *Can Fam Physician.*1988;34:2221–2226.
 12. Marchant DJ. Inflammation of the breast. *ObstetGynecolClin North Am.* 2002; 29(1):89–102.
 13. Karstrup S, Solvig J, Nolsoe CP, et al. Acute puerperal breast abscesses: US-guided drainage. *Radiology* 1993;188:807–09
 14. Sharma R. Drainage of puerperal breast abscess by percutaneous placement of suction drain should not be popularized as a novel surgical technique outside carefully controlled trials. *Ind J Surg.* 2007;69(1):33.
 15. Dixon JM. Repeated aspiration of breast abscesses in lactating women. *BMJ* 1988;297:1517–18
 16. Nyaman MK, Carson RA. Breast abscess in Lactating women: U.S.-guided treatment. *Radiology.*2004;232(3):904–909
 17. Sarhan HH, Ibraheem MO. Percutaneous Needle Aspiration Is A Minimally Invasive Method for A Breast Abscess. *Arch Clin Exp Surg.*2012; 1: 105- 109.
 18. Chandika BA, Gakwaya MA, MalwaddeKE, et al ;Ultrasound Guided Needle Aspiration versus Surgical Drainage in the management of breast abscesses: a Ugandan experience. *BMC Research Notes.*2012; 5: 12
 19. Schwarz RJ, Shrestha R. Needle aspiration of breast abscesses. *Am J Surg.* 2001; 182(2): 117– 119.
 20. Christensen AF, Suliman AN, Nielsen RK, H et al. Ultrasoundguided drainage of breast abscesses: results in 151 patients. *The British Journal of Radiology.*2005; 79: 186-188.
 21. Berna-Serna DJ, Madrigal M. Percutaneous management of breast abscesses—an experience of 39 cases. *Ultrasound in Medicine & Biology.*2004; 30: 1-6.
 22. O'Hara RJ, Dexter SP, Fox JN. Conservative management of infective mastitis and breast abscesses after ultrasonographic assessment. *Br J Surg* 1996; 83:1413–14.
 23. Hook GW, Ikeda DM. Treatment of breast abscesses with US-guided percutaneous needle drainage without indwelling catheter placement. *Radiology.* 1999;213(2):579–582.
 24. Anderson Muir's JR. ELBS pg 4.30. 12 Text book of Pathology
 25. Tewari M, Shukla HS. Effective method of drainage of puerperal breast abscess by percutaneous placement of suction drain. *Ind J Surg.* 2006; 68(6):330–333.
-