Original Article

Outcome of Percutaneous Needle Aspiration in the Treatment of Lactational Breast Abscess

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ABSTRACT

OBJECTIVE: To evaluate the clinical outcome of ultrasound guided percutaneous needle aspiration in lactational breast abscess in terms of complete resolution of abscess, need of incision & drainage and uninterrupted breast feeding.

METHODOLOGY: This descriptive cross-sectional study was conducted at Liaquat University Hospital Hyderabad from March-May 2020. Patients with Lactational breast abscess diagnosed on the basis of history, clinical examination and further confirmed on ultrasound were enrolled in the study. Patients presented with already burst abscess or recurrent abscess were not included in the study. Every patient was submitted for ultrasound guided per cutaneous needle aspiration. Failure of procedure was considered on the basis of persistence of clinical features and ultrasound evidence of residual collection after three attempts of aspiration. The patients were offered incision and drainage as next treatment modality. Data was analyzed on SPSS version 22. Results were analyzed for mean, frequency and percentage.

RESULTS: A total of 68 patients with breast abscess were included. The mean age was 24.76±3.15 years. Out of 68 lactating women, 50 (73.5%) abscesses were treated with a combination of ultrasound guided percutaneous aspiration and oral antibiotics. Eighteen patients (26.4%) did not respond even after three attempts of aspiration and submitted for incision and drainage. Cracked nipples were observed as the predisposing factor for development of abscess in 47(69%) patients, 44 patients (64%) were able to continue breast feeding from both sides.

CONCLUSION: Ultrasound guided needle aspiration should be used as initial treatment modality in lactational breast abscess especially for patients who present early with small abscess.

KEY WORDS: Lactational Breast abscess, Ultrasound guided needle aspiration, Incision and drainage.

This article may be cited as: Sushel C, Kalhoro N, Luxmi S, Das K, Khaskheli GA, Mallah Q. Outcome of Percutaneous Needle Aspiration in the Treatment of Lactational Breast Abscess. J Liaquat Uni Med Health Sci. 2020;19(04):233-7. doi: 10.22442/jlumhs.201940696

INTRODUCTION

Breast infections are common problems in lactating women which ranges from mastitis to abscess formation. Lactational breast abscess is defined as the collection of septic fluid that develops into the mammary glands during the period of lactation. Breast abscess is a sequela of mastitis if not treated on time[1]. About 3% to 20% lactating women are at risk of developing mastitis[2] and about 4.6% to 11% of patient with mastitis develop breast abscess[3]. 85% of abscesses develop within 6 months in primiparous women because of faulty breast feeding techniques[4].

Although the exact etiology of breast abscess is not known, but may be because of improper attachment between baby's mouth and breast, resulting in the breach in the skin of nipple and areola. Through these ulcers the organisms gain entry to the breast substances. If the breast is not emptied properly, lactose rich milk provides a culture medium for the bacteria that is introduced through the terminal ducts of the nipple results in mastitis and abscess formation[5-7]. Other risk factors for the development of breast abscess are advanced maternal age, prolong pregnancy, poor personal hygiene, poor sucking, reduced number of feeds, infection in the oral cavity of baby, infected post traumatic hematoma, smoking, obesity and presence of nipple ring[2,8]. Inadequate sleep and stress is one of the contributing factors in a lactating mother.

Staphylococcus aureus is the most frequent causative pathogen but in some cases staphylococcus epidermidis and streptococcus species are found on culture media[9-11]. Although the bacteria may be present in the milk but continue feeding from both sides is still safe for the baby because mother's milk contains antibodies which provide immunological protection to baby[2].

Patient usually presents with painful swelling, fever with rigors & malaise. Clinical examination may reveal cracked nipples, erythema, edema, and tender swelling with or without palpable axillary lymph nodes. Sometimes patient present with painless fluctuating swelling because of multiple courses of antibiotics prescribed by general practitioners. Skin necrosis and spontaneous burst abscess is a feature of delayed

presentation. Although it is a clinical diagnosis but ultrasonography is the recommended investigation prior to offer any treatment in the emergency setting.

For the past few decades treatment modalities are being used to treat breast abscess such as per cutaneous needle aspiration with or without ultrasound guidance[12,13], ultrasound-guided percutaneous pigtail catheter drainage, mammotome biopsy system[9], vacuum assisted biopsy[14] and incision & drainage. Conventional open surgical drainage is a gold standard procedure in the management of lactational breast abscess because all loculi are broken down with low risk of recurrence. However, patients need hospital admission, require general anesthesia, daily dressing with poor cosmetic outcome[15]. There are chances of damage to major lactiferous duct resulting in mammary fistula. The other problem associated with open surgical drainage is patient's refusal for breast feeding her baby because of pain and strong belief of transfer of infection to baby.

Recent research studies reported that breast abscesses can be treated by ultrasound-guided needle aspiration. With the help of ultrasound, multiple and lobulated abscesses can be drained completely with very low risk of recurrence[12,16]. Ultrasound assisted needle aspiration is a least invasive outpatient (OPD) treatment with excellent cosmetic outcomes.

Percutaneous needle aspiration can be repeated 2-3 times with minimum morbidity. However ultrasound guided needle aspiration has some limitations for large abscess or abscesses with thick material. Patient may need incision and drainage, if does not respond after two to three sessions of aspiration.

The aim of our study is to evaluate the clinical outcome of ultrasound guided percutaneous needle aspiration in lactational breast abscess in terms of complete resolution of abscess, need of incision & drainage and uninterrupted breast feeding.

METHODOLOGY

This descriptive cross-sectional study was performed at Liaquat University Hospital Hyderabad from March to May 2020. Approval was taken from institutional research and ethical committee. Patients with Lactational breast abscess diagnosed on the basis of history and clinical examination and further confirmed on ultrasound were enrolled in the study. Patients who presented with already burst abscess, recurrent breast abscess and non lactational breast abscess were excluded from the study. All participants were well informed regarding purpose, procedure and benefits of treatment and informed and written consent was taken. A pre-designed proforma was used for data collection. The outcome variables are complete resolution of abscess and continuation of breast feeding.

As this was an OPD procedure, patients were brought directly to the radiology department. After following the aseptic protocol, the overlying skin adjacent to the abscess was infiltration with 2% Lignocaine. Under ultrasound guidance 20ml disposable syringe inserted into the abscess cavity, Initial aspirated pus was sent for culture and sensitivity. Aspiration was continued until there was no significant residual material. After the procedure, the patients were send back to home on oral antibiotics. Patients were motivated to continue breast feeding as soon as possible. On fourth day of procedure, the follow up ultrasound was done, if re-aspiration was needed it was performed at same visit. Failure of procedure was considered on the basis of persistence of clinical feature and ultrasound evidence of residual collection after three attempts of aspiration. The patients were offered incision and drainage as treatment modality.

Data was analyzed using Statistical Package for Social Sciences (SPSS version 22.0). Chicago Illinois, USA), continuous variables like age and size of abscess cavity were measured with the help of ultrasound were summarized by mean with standard deviation or median and ranges whenever appropriate. Categorical variables such as parity, number of aspiration, conversion to incision and drainage, feeding status were analyzed as proportions and percentages. Stratified analysis was done. Chi Square test was applied where applicable and pivalueilessithani0.05 was considered significant.

RESULTS

Our study comprises of 68 patients. The mean age±SD of the patient was 24.76±3.15 years. (Demographic features of study population shown in Table I).

Out of 68 lactating women, 50 (73.52%) abscesses were treated with a combination of ultrasound guided percutaneous aspiration and oral antibiotics. 18 patients (26.47%) did not respond even after three attempts of aspiration and submitted for incision and drainage. Success rate of needle aspiration is inversely proportion to the size of abscess cavity and duration of illness (Table II)

The pus Culture and Sensitivity (C/S) report showed Staphylococcus aureus in 53 patients (77.9%), other organisms in 3 patients (4.4%) and no growth on pus C/S in 12 patients (17.64%).

In this study, cracked nipples were observed as the predisposing factor for development of abscess in 47 (69%) patients. All of them were primiparous.

Out of 68 patients, 24 patients were unable to continue breast feeding, 7 patients after I/D, develop mammary fistula, which does not respond on conservative treatment and require cessation of lactation. The remaining 17 patients were unable to continue breast feeding because of pain in 8 patients, hardening of nipple/breast tissue in 6 patients and fear

of transmission of infection to baby in 3 patients.

TABLE I: DEMOGRAPHIC FEATURES OF THE STUDY POPULATION (n=68)

Variables	Frequency	Percentage
Site of abscess		
Right breast	44	64.7
Left breast	23	33.8
Bilateral	01	1.5
Quadrants involved		
Upper outer quadrant	22	32.4
Upper inner quadrant	13	19.1
lower outer quadrant	15	22.1
lower inner quadrant	03	4.4
sub/retroaerolar/central	06	8.8
more than one quadrant	09	13.2
Parity		
1st child	49	72.1
2nd child	09	13.2
More than 2 children	10	14.7
Predisposing factors		
Cracked nipples	47	69
History of trauma	02	3
Delayed feeding	02	3
None	17	25
Time of development of abscess after the birth of baby		
0-1 month	36	52.9
1-3 months	24	35.2
3 months onwards	08	11.7

DISCUSSION

A breast abscess is a troublesome problem for the lactating mother. The conventional method of treatment of lactational breast abscess is open surgical drainage. Currently ultrasound guided aspiration of abscess as the first line treatment option under cover of antibiotics shown the promising results. It is evident that when compared to open surgical drainage, percutaneous ultrasound guided needle aspiration has superior results. There is no need of hospital admission, general anesthesia, surgery and painful postoperative dressings. The discomfort after aspiration is minimal and no any chance of troublesome milk fistula that often follow incision and drainage.

Literature review was carried out by Elaine Lam, according to author's recommendations, needle aspiration either with or without ultrasound guidance should be employed as first line treatment for breast abscess[16]. Same observations were shared by Kamal Kataria[2].

In our study, we were able to achieve 73.5% cure rate in percutaneous ultrasound guided needle aspiration. The studies conducted by kaushal[17] reported 82% cure rate. In Catherine's study[12], successive rate of US guided percutaneous drainage is 96% even for abscess greater than 5cm. Sheikh[18] reported 83% successive rate of needle aspiration without utilizing ultrasound facility.

In present study, on U/S the size of the cavity ranges from 2-10cm. In Hook GW[19] study the size ranged from 1 to 15 cm showed the success rate of 83.3%.

TABLE-II: RELATIONSHIP OF SIZE OF CAVITY, AREA INVOLVED AND DURATION OF ILLNESS WITH NUMBER OF PERCUTANEOUS ASPIRATIONS, INCISION AND DRAINAGE

	Aspiration				Total 68
	Single n = 9	Twice n = 23	Three times n = 18	Convert to ID n = 18	
Size of cavity on ultrasound					
2-4 cm	7(10.2%)	11(16.1%)	5(7.3%)	0	23(33.8%)
5-7 cm	2(2.9%)	10(14.7%)	11(16.1%)	6(8.8%)	29(42.6%)
8-10 cm	0	2(2.9%)	2(2.9%)	12(17.6%)	16(23.5%)
Area involved					
Upper inner	3(4.4%)	6(8.8%)	4(5.8%)	0	13(19.1%)
Upper outer	2(2.9%)	8(11.7%)	10(14.7%)	2(2.9%)	22(32.3%)
Lower inner	0	1(1.4%)	1(1.4%)	1(1.4%)	3(4.4%)
Lower outer	4(5.8%)	7(10.2%)	2(2.9%)	2(2.9%)	15(22.0%)
Central	0	1(1.4%)	1(1.4%)	4(5.8%)	6(8.8%)
More than one quadrant	0	0	0	9(13.2%)	9(13.2%)
Duration of disease					
5 days	9(13.2)	10(14.7%)	1(1.4%)	0	20(29.4%)
5-10 days	0	13(19.1%)	16(23.5%)	7(10.2%)	36(52.9%)
more than 10 days	0	0	1(1.4%)	11(16.1%)	12(17.6%)

In our series 36 of 68 (53%) cases the symptoms occurred in the first 4 weeks after the birth of the baby and the commonest organism was staphylococcus aureus. Similar observations were reported by Lukassek[11]. On the other hand, Leung observed only 35% cases present within one month after delivery[5].
Sheik WI[18] observed that, those patients who presents within 5 days of onset of symptoms had complete resolution of abscess with needle aspiration. In our study, there was 29.4% resolution of abscess in patients who presented within 5 days of development of symptoms. 16.1% of patients need incision & drainage who presented after 10 days of development of symptoms.
In the developed world, because of the availability of better health services, patients usually present early, so the results of aspiration are much better than our population.
As lactational breast abscesses are frequently multiloculated so multiple sessions of aspirations under U/S guidance are required to overcome this problem. Chances of treatment failure are more when abscess is multiloculated, located at retroaerolar region or abscess is very thick in consistency[19]. Our study showed that needle aspiration was failure in 18 /68 patients. out of which 9/18 having abscess involving more than one quadrant and 4/18 patients presented with retroaerolar abscess. In our study, the first aspirate was pure pus, whereas the subsequent aspirated material changes from pus mixed with blood to serous fluid.
Study conducted by Elain Lam shows that nursing an infant from the infected breast may put the infant at risk for developing pneumonia, lung abscess and can be fatal specially when abscess caused by staphylococcal organisms. The feeding can be continued from the contralateral breast[16].
In our study 44 patients (64%) were able to continue breast feeding from both sides. We could not found any complication in the infant. According to the data collected by Michael, there is no indication to stop feeding in case of breast engorgement, infection and even after development of abscess. Acute cessation of breast feeding and improper expression of milk from all the quadrants even aggravates the symptoms[1,20]. Though milk expressed from the infected breast contain bacteria, but at the same time it secrets antibodies which provide immunity to the nursing child[2]. Falcon did not report any complication due to breast abscess in nursing baby[13].
Incidence of lactational breast abscess has decline worldwide due to better health care facilities, improved hygiene and early administration of antibiotics. However, our study has shown that this is still a major health problem in nursing mothers. Most of these patients belong to poor families and therefore, this increased incidence can be attributed to multiple factors including poor immunity, faulty nursing technique, delay in administration of treatment, improper drug doses result in resistance to treatment.

CONCLUSION

Ultrasound guided aspiration along with oral antibiotic is safe, effective and feasible treatment option for lactational breast abscess, especially in patients who present early with small breast abscess. Patients should be motivated to continue breast feeding.

Ethical permission: Liaquat University of Medical & Health Sciences ERC permission letter No. LUMHS/ REC/-882, dated: 13-03-2020.

Conflict of Interest: There is no conflict of interest.

Funding: There was no any funding agency.

AUTHOR CONTRIBUTIONS

Sushel C: Data collection & compiling
Kalhoro N: Data collection & statistical analysis
Luxmi S: Help in controlling infection
Das K: Data collection
Khaskheli GA: Data collection & compiling
Mallah Q: Data collection & compiling

REFERENCES

1. Amir LH. ABM clinical protocol #4: Mastitis, revised March 2014. Breastfeed Med. 2014; 9(5): 239-43. doi: 10.1089/bfm.2014.9984.
2. Kataria K, Srivastava A, Dhar A. Management of lactational mastitis and breast abscesses: review of current knowledge and practice. Indian J Surg. 2013; 75(6): 430-5. doi: 10.1007/s12262-012-0776-1.
3. Merz L, De Courten C, Orasch C. Breast infection. Rev Med Suisse. 2014; 10(427): 925-6, 8-30.
4. Afridi SP, Alam SN, Ainuddin S. Aspiration of breast abscess through wide bore 14-gauge intravenous cannula. J Coll Physicians Surg Pak. 2014; 24(10): 719-21. doi: 10.2014/JCPSP. 719721.
5. Leung SS. Breast pain in lactating mothers. Hong Kong Med J. 2016; 22(4): 341-6. doi: 10.12809/ hkmj154762.
6. Dennis CL, Schottle N, Hodnett E, McQueen K. An all-purpose nipple ointment versus lanolin in treating painful damaged nipples in breastfeeding women: a randomized controlled trial. Breastfeed Med. 2012; 7(6): 473-9. doi: 10.1089/bfm.2011. 0121.
7. Barron AU, Luk S, Phelan HA, Williams BH. Do acute-care surgeons follow best practices for breast abscess management? A single-institution analysis of 325 consecutive cases. J Surg Res. 2017; 216: 169-71. doi: 10.1016/j.jss.2017.05.013.
8. David M, Handa P, Castaldi M. Predictors of outcomes in managing breast abscesses-A large retrospective single-center analysis. Breast J. 2018; 24(5): 755-63. doi: 10.1111/tbj.13053.

9. Wang K, Ye Y, Sun G, Xu Z. The Mammotome biopsy system is an effective treatment strategy for breast abscess. Am J Surg. 2013; 205(1): 35-8. doi: 10.1016/j.amjsurg.2012.05.012.
10. Branch-Elliman W, Lee GM, Golen TH, Gold HS, Baldini LM, Wright SB. Health and economic burden of post-partum Staphylococcus aureus breast abscess. PloS one. 2013; 8(9): e73155. doi: 10.1371/journal.pone.0073155.
11. Lukassek J, Ignatov A, Faerber J, Costa SD, Eggemann H. Puerperal mastitis in the past decade: results of a single institution analysis. Arch Gynecol Obstet. 2019; 300(6): 1637-44. doi: 10.1007/s00404-019-05333-3.
12. Colin C, Delov AG, Peyron-Faure N, Rabilloud M, Charlot M. Breast abscesses in lactating women: evidences for ultrasound-guided percutaneous drainage to avoid surgery. Emerg Radiol. 2019; 26(5): 507-14. doi: 10.1007/s10140-019-01694-z.
13. Falco G, Foroni M, Castagnetti F, Marano L, Bordoni D, Rocco N, et al. Ultrasound-Guided Percutaneous Catheter Drainage of Large Breast Abscesses in Lactating Women: How to Preserve Breastfeeding Safely. Breastfeed Med. 2016; 11: 555-6. doi: 10.1089/bfm.2016.0121.
14. Chen C, Luo LB, Gao D, Qu R, Guo YM, Huo JL, et al. Surgical drainage of lactational breast abscess with ultrasound-guided Encor vacuum-assisted breast biopsy system. Breast J. 2019; 25 (5): 889-97. doi: 10.1111/tbj.13350.
15. Jahanfar S, Ng CJ, Teng CL. Antibiotics for mastitis in breastfeeding women. Sao Paulo Med J. 2016; 134(3): 273. doi: 10.1590/1516-3180.20161343T1.
16. Lam E, Chan T, Wiseman SM. Breast abscess: evidence based management recommendations. Expert Rev Anti Infect Ther. 2014; 12(7): 753-62. doi: 10.1586/14787210.2014.913982.
17. Suthar K, Mewada B, Surati K, Shah J. Comparison of percutaneous ultrasound guided needle aspiration and open surgical drainage in managemnet of purperal breast abscess. Int J Med Sci Public Health. 2013; 2(1): 69-72. doi:10.5455/ijmsph.2013.2.69-72.
18. Sheih WI, Suleri M, Kulsoom M. Comparison of multiple needle aspirations and open surgical drainage in management of breast abscess. JRMC. 2009; 13(1): 30-3.
19. Hook GW ID. Treatment of breast abscesses with US-guided percutaneous needle drainage without indwelling catheter placement. Radiology. 1999; 213(2): 579-82. doi: 10.1148/ radiology.213.2.r99nv25579.
20. Abou-Dakn M, Richardt A, Schaefer-Graf U, Wockel A. Inflammatory Breast Diseases during Lactation: Milk Stasis, Puerperal Mastitis, Abscesses of the Breast, and Malignant Tumors - Current and Evidence-Based Strategies for Diagnosis and Therapy. Breast Care (Basel). 2010; 5(1): 33-7. doi: 10.1159/000272223.

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