Original Article

Comparison Between Aspiration and Incision & Drainage of Breast Abscess

Afzaal Baig[1], Muhammad Waqid Bin Abdullah[1], Zubair Ahmad[1], Syed Muhammad Talha Bukhari[2], Haseeb Ahmad[1] and Roshan Butt[1]

ABSTRACT

Objective: To compare outcomes of needle aspiration and surgical incision and drainage of breast abscess.
Study Design: Randomized controlled trial.
Place and Duration of Study: This study was conducted at the Department of Surgery, Services Institute of medical sciences, Lahore from July 2020 to January 2021.
Methods: A total of 60 female patients between the ages of 18 to 65 years presented with unilateral breast abscess were included in the study and divided into 2 equal groups of 30 patients each. Females in Group-NA were treated with ultra sound guided needle aspiration while females in Group-I&D were treated with incision and drainage of the breast abscess. The primary outcomes were set as time taken for the procedure and duration of hospital stay among the two groups.
Results: The Mean±SD of age in this study was 39.93±13.97 years with an age range of 25-58 years. The size of abscess in Group-NA was 7.2±1.71 cm while this size was 6.96±1.56 cm in Group-I&D. The results of the primary outcomes of the study show significantly less time required for procedure in Group-N A compared to Group-I&D (7.2±1.54 Vs 19.96±2.77 minutes, p= 0.000). Similarly mean duration of hospital stay was significantly less in Group-NA compared to Group-I&D (1.63 ± 1.06 Vs 3.23 ± 1.38 days, p=0.000).
Conclusion: Needle aspiration provides the major advantages of less time required for procedure and reduces duration of hospital stay compared to incision & drainage procedure in females with breast abscess.
Key Words: Breast abscess, Incision & Drainage, Needle aspiration.

Citation of article: Baig A. Waqid Bin Abdullah M, Ahmad Z, Bukhari SMT, Ahmad H, Butt R. Comparison Between Aspiration and Incision & Drainage of Breast Abscess. Med Forum 2024;35(3):65-69. doi:10.60110/medforum.350315.

INTRODUCTION

A breast abscess is a type of localized infection caused by purulent fluid accumulated within the breast tissue. This is a frequently reported complaint by lactating mothers that ranges from infection in the breast to the formation of an abscess.[1] These abscesses are found as a common reasons for morbidity and breastfeeding disruption in nursing mothers.[2] Among the globally reported incidences of mastitis, the highest are observed in women in their early postpartum weeks and out of cases of mastitis 3-11% is then presented as the cases of breast abscesses.[3]

Although the cases are reducing in developed countries, they are still a common complaint in the developing countries. In a study conducted in Ethiopia, among the total emergency admissions, nearly 3% were of breast abscess which made it 9th frequent reason for admissions in general surgery department. In a study by Khan ZM conducted in Pakistan, this incidence was reported to be approximately 10.2%.[2,4] The complaint of breast abscess presented by women belonging to reproductive age and associated with lactation is termed as puerperal and nearly 0.4% of lactating mothers suffers from this type of breast abscess.[5] There are also abscesses of non-lactational (non-puerperal) origin and are presented by older premenopausal women. The non-lactational abscesses are further divided as peripheral and central periareolar.[1]

The etiology of puerperal and non-puerperal abscesses is different. Puerperal abscess is formed as a result of inflammation of a breast in the lactating mother or due to any unresolved mastitis. Bacteria especially Staphylococcus aureus are introduced through nipples and spread in lactoserum media. The other bacteria involved in puerperal abscess are S epidermidis and streptococci.[6] The non-puerperal abscess have no established etiology and are explained as result of autoimmunity, some kind of infections or any hypersensitivity reactions.[7]

If a breast abscess is not treated promptly and effectively, it can worsen and result in the loss of breast tissue and skin, which may require reconstruction and resurfacing of the breast.[8] The clinical diagnosis of breast abscess is made through patient's complaints of

[1.] Department of Surgery, Services Hospital, Lahore.
[2.] Department of Surgery, PKLI, Lahore.

Correspondence: Muhammad Waqid Bin Abdullah, Surgical Department, Services Hospital, Lahore.
Contact No: 03338002606
Email: waqidabdullah@gmail.com

Received: May, 2023
Accepted: August, 2023
Printed: March, 2024

chills, fever and malaise and confirmed by ultrasonography (US) scan. The use of US avoids unnecessary procedures as if it is only in earlier cellulitic phase, it can be treated with anti-inflammatory and antibiotic agents .[9]

If puss is found in USG, incision and drainage (I & D) has remained most advised and successful course of treatment for both types of breast abscess. Despite being effective this strategy has some disadvantages in shape of requiring general anesthesia in most cases, stress of surgical procedure on the patient, longer healing time, need for longer hospitalization and need the change of dressings for next few days. Moreover there is interruption in breast feeding, scars at the place of surgical wound and risk of breast deformation.

In view of the above mentioned draw backs needle aspiration (NA) has been used with satisfactory results without these unfavorable outcomes. Some studies showed lower cure rate of up to 82% with NA but under the guidance of real time high resolution US, NA has given good results than NA alone and is therefore now more frequently used by the surgeons.[10,11,12]

Colin C shared the results of study including 92 patients with puerperal breast abscess where alternative methods US guided NA, vacuum-assisted aspiration or pigtail catheter were used to cure the abscess. The results showed that US guided procedures provided recovery in 96% of the patients (47% of the patients were cured in the first round while 53% needed more than one procedure for the cure). The procedure was effective even in abscess > 5cm and didn't need discontinuation of breastfeed.[13] Hence the US guided NA provides a good cure rate. Besides the overall cure rate, US guided NA allows the surgeon to complete the procedure in less time and reduces the overall duration of hospital stay (DHS). This lessens the overall burden both on surgeons and the patients.

Although studies have been conducted with US guided NA confirming its good cure rate and shortening the complete healing time, few have discussed the total time of surgeon consumed for the procedure and shortening of need of the hospital stay compared to conventional I&D technique in our local population.[14]

This study was therefore planned to compare outcomes of a US guided NA and I&D for curing breast abscess in shape of time taken for the procedure and DHS after the procedure. The results will help the surgeons to treat the breast abscess by utilizing lesser time and cutting short the overall cost of treatment.

METHODS

This randomized controlled trial was conducted at the Department of Surgery, Services Institute of Medical Sciences (SIMS), Lahore from July 2020 to January 2021 over a period of 6 months.

The sample size calculations were done as per following details:

Confidence interval=95%, power=80%.

p1 (mean DHS with US guided NA) = 0.2 ± 0.55 days

p2 (mean DHS with I&D) =1.16 ± 0.37 days. [14]

Estimated sample size n1=30, n2=30.

A total of 60 women aging between 18 to 65 years and diagnosed with unilateral breast abscess were included in the study through consecutive sampling and randomized into 2 equal groups of 30 patients each using computer generated randomization sheet.

Exclusion criteria were defined as women having a history of TB, complex breast abscess, ulceration, necrosis, recurring breast abscess (based on history), ruptured abscess (based on clinical examination), and pregnant women.

Patients in Group-I&D underwent incision and drainage of the breast abscess, while patients in Group-NA had US guided needle aspiration of the breast abscess.

An 18 G needle and a 20 ml syringe were utilized in each instance in Group-NA. The abscess was located once the breast was stabilized using the thumb and index finger. Under local anesthetic with 2% lidocaine, a needle was inserted into the abscess from the region with normal skin. The process continued until no pus was aspirated. If necessary, aspiration was repeated every other day until the mass had fully disappeared or until three needle aspirations were completed (if the lump did not disappear after using three needles, treatment failure was recognized).

Under general anesthesia, the abscess in Group-I&D was targeted and excised close to the areolar border and along the skin's edge. The pus was fully removed from the loculi after they were fractured digitally or with artery forceps. Until the wound was cleansed and granulated, the wounds were kept exposed to drain and treated every other day.

For two days after the completion of the surgeries, the patients were advised to take oral medications including amoxicillin (500 mg), clavulanate (125 mg), diclofenac (50 mg), and pantoprazole (40 mg).

The length of the patient's hospital stay and the amount of time the surgical team needed to complete the surgery were the main goals.

Women were classified as breast abscess patients when they showed up with pain (VAS > 3) and edema across one or both breasts, combined with an abscess measuring less than 10 cm in diameter on the US.

From the moment the surgeon stabilizes the breast for aspiration or incision until the final dressing is placed, the procedure's duration was computed.

From the day the patient was admitted to the hospital for the surgery to the day they were deemed well enough to be released without any problems, DHS was calculated.

The hospital's ethics committee granted permission to proceed with the research.

Participants gave their signed permission after being informed of the goal of the research. SPSS version 25 was used for the data analysis process. Whereas qualitative data were shown as frequency and percentage, quantitative factors were portrayed as mean and standard deviation. To determine the significance of the difference between the two groups, an independent t-test was used, with p≤0.05 being considered significant.

RESULTS

The Mean±SD of age in this study was 39.93±13.97 years with an age range of 25 to 58 years. The demographic details and base line clinical characteristics are shown in Table-1.

Table No. 1: Demographics and baseline clinical characteristics
n=60

Demographics and baseline clinical characteristic		Group-NA n=30	Group-I&D n=30
Age (Mean±SD) years		38.80±13.01	41.07±13.85
Parity (Mean±SD)		2.9±1.06	2.83±0.98
Lactation	Yes n(%)	15 (50)	12 (40)
	No n (%)	15 (50)	18 (60)
Size of abscess (Mean±SD) cm		7.2±1.71	6.96±1.56
Size of abscess	≤5 cm n(%)	8(26.66)	8 (26.66)
	>5 cm n (%)	22 (73.33)	22 (73.33)

The results of primary outcomes of the study show significantly less time consumed in performing the procedure and significantly less DHS in Group-NA compared to Group-I&D as shown in Table-2.

Table No. 2: Results of primary outcomes
n=60

Primary outcomes	Group-NA n=30	Group-I&D n=30	p-value
Time required for procedure (Mean±SD) min	7.2±1.54	19.96±2.77	0.000
DHS (Mean±SD) days	1.63±1.06	3.23±1.38	0.000

We also stratified the results according to size of abscess and results show that the time required for procedure was significantly less in Group-NA compared Group- I&D irrespective of the size of the abscess as shown in Table-3.

Table No. 3: Time required for procedure as per size of abscess n=60

Time required for procedure as per size of abscess	Group-NA n=30	Group-I&D n=30	p-value
≤5 cm (Mean±SD) min	6.62±1.30	19.37±3.2	0.000
>5 cm (Mean±SD) min	7.40±1.59	20.18±2.64	0.000

DISCUSSION

The procedure of NA has been discussed in a lot of studies which show its high cure rate however the outcomes like time required by the surgeon to perform the procedure and DHS after the procedure has been less studied especially in comparison to conventional I&D technique.

Saeed S et al. compared the NA versus I&D for managing breast abscess ≤5 cm in diameter. This study conducted with Pakistani population reported a comparable healing time among the 2 groups. The researchers mentioned that the method of NA was more feasible for the surgical team and acceptable for the patients.[15]

Karvande R compared traditional method of I&D and US guided NA in treating breast abscess < 10 cm size. The results of this study showed a significantly less mean procedure time (6.63±01.61 Vs 18.87±2 minutes respectively, p=0.000) and DHS (0.2±0.55 Vs 1.16±0.37 days respectively, p= 0.000) in Group undergoing NA compared to Group where I&D was used.[14]

Fardhus et al. compared the NS and I&D methods with the aims of finding the better treatment in shape of less time consumed in procedure. The outcomes of the study showed significantly less time required for performing the procedure in NA technique compared to I&D technique (6.62± 1.5 min Vs 18.81 ± 2.10 min). The author mentioned NA method as a simple and feasible procedure that can be done even without US and no use of anesthesia was needed. [16]

Saboo A in their study on the trends in the management of non-puerperal breast abscess mentioned NA as a procedure that allows a significantly shorter hospital stay compared to operative management.[17]

In a recent study published study in December 2023, Ubaid M and co-researchers compared the US guided NA technique and traditional I&D technique for the management of breast abscess. The outcomes of the study showed a significantly less mean procedure time in group with NA technique compared to I&D technique (7.72±1.96 Vs 22.22±3.07 min respectively, p<0.001). Similarly, there was a significant difference in the length of hospital stay in NA group compared to I&D group (1.36±0.49 days Vs 2.01±0.39 days, p<0.001).[18] The Mean±SD of age in our study was

39.93±13.97 years with an age range of 25-58 years. The size of abscess in Group-NA was 7.2±1.71 cm while this size was 6.96±1.56 cm in Group-I&D and majority of patients in both groups (73.33%) had abscess > 5 cm in diameter. The results of the primary outcomes of the study show significantly less time required for procedure in Group-NA compared to Group-I&D (7.2±1.54 Vs 19.96±2.77 minutes, p= 0.000). These results are in line with the results shared by previous studies conducted with NA techniques for the treatment of breast abscess.[14,15,16,18] We also stratified the results as per size of abscess and found that the procedure required less time for both the abscesses ≤5 cm and > 5 cm to 10 cm.

Similarly mean DHS was significantly less in Group-NA compared to Group-I&D (1.63 ± 1.06 Vs 3.23 ± 1.38 days, p=0.000). This benefit of shorter DHS was also shared by previous researchers and is valuable for surgeons for less work burden and for patients in relieving psychological and financial burden. [14,15,17]

These results provide valuable evidence for the treatment of breast abscess for adopting more useful method than the traditional strategies for both surgeons and patients.

An additional advantage of the procedure is that the sample can be sent for diagnosis of possible carcinoma and thus operation can be avoided in that situation.

A review published in European Journal of Breast Health also stated that if the clinicians present at the primary health care centers refer the cases at early phase prior to complications, breast abscess can be resolved with minimum invasive procedure of needle aspiration combined with an antibiotic and the surgical incision can be avoided preserving the natural shape and skin of the breast.[18]

The major limitation of this study is small sample size and shorter follow up period. Future studies with longer follow up and higher number of patients can provide more useful data over the subject.

CONCLUSION

NA provides the major advantages of less time required for procedure and reduced need of hospital stay compared to I&D procedure in females with breast abscess. The method can be adopted on priority because it can be performed on immediate basis without the need of complete operation theater settings and does not need any specialty skills.

Author's Contribution:

Concept & Design of Study:	Afzaal Baig
Drafting:	Muhammad Waqid Bin Abdullah, Zubair Ahmad
Data Analysis:	Syed Muhammad Talha Bukhari, Haseeb Ahmad, Roshan Butt
Revisiting Critically:	Afzaal Baig, Muhammad Waqid Bin Abdullah
Final Approval of version:	Afzaal Baig

Conflict of Interest: The study has no conflict of interest to declare by any author.

Source of Funding: None

Ethical Approval: No.ERB/652/1148/SIM Dated 05.01.2020

REFERENCES

1. Kang YD, Kim YM. Comparison of needle aspiration and vacuum-assisted biopsy in the ultrasound-guided drainage of lactational breast abscesses. Ultrasonography 2016;35(2):148-52.
2. Khan ZM, Jamal S, Khaliq T, Shabbir S. The frequency of various causes of breast lumps in females presenting to surgical OPD in a tertiary care hospital. Ann Pak Inst Med Sci 2013;9:26-9.
3. Boakes E, Woods A, Johnson N, Kadoglou N. Breast infection: a review of diagnosis and management practices. Eur J Breast Health 2018;14(3):136–143.
4. Argaw F, Bekele Muleta M, Tsehay A, et al. Pattern of general surgical and urologic admissions at St. Paul's hospital millennium medical college. Ethiop Med J 2019;57(1):19.
5. Fathy E, Nashed GA, Awadallah EG, Shokralla SY. Comparative study between surgical drainage of acute lactational breast abscess and ultrasound-guided needle aspiration and/or drainage. Egypt J Surg 2022;41:97–104.
6. Liu L, Zhou F, Wang P, et al. Periductal mastitis: an inflammatory disease related to bacterial infection and consequent immune responses? Mediators Inflamm 2017;2017:5309081.
7. Bi J, Li Z, Lin X, et al. Etiology of granulomatous lobular mastitis based on metagenomic next-generation sequencing. Int J Infect Dis 2021;113:243–250.
8. Ibrahim MH, Omoyibo EE. Management challenges of complicated lactational breast abscess in a tertiary health facility in a resource-constrained environment. Nigerian J Plastic Surg 2019;15(1):20-3.
9. Khowaja MA, Jamali AH, Zardari IA, Ghumro AH, Dahri FJ. Incidence and management of breast abscess in lactating and non-lactating females. National Editor Advis Board 2019;30(2)27-30.
10. Randhawa SR, Akram M, Akram H, Sajid M. Comparison of needle aspirations and incision and drainage of breast abscesses. J Univ Med Dent Coll 2019;10:40–4.
11. Patani N, MacAskill F, Eshelby S, et al. Best-practice care pathway for improving management of mastitis and breast abscess. Br J Surg 2018;105(12):1615–1622.

12. Omranipour R, Vasigh M. Mastitis, breast abscess, and granulomatous mastitis. Adv Exp Med Biol 2020;1252:53–61.
13. 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):1-8.
14. Karvande R, Ahire M, Bhole M, Rathod C. Comparison between aspiration and incision and drainage of breast abscess. Int Surg J 2016;3(4):1773-80.
15. Saeed S, Naumani AR, Kazmi A, Khalid R, Ali M, Naqi SA, et al. Comparison between needle aspiration versus incision and drainage in management of breast abscess. Pak J Surg 2021;37(1): 56-58.
16. Fardhus, Sharfuzzaman AMSM, Dewan N, Kirttania DC, Sami-AI-Hasan A, Rab JZ. Comparison between aspiration and incision and drainage of breast abscess. J Surgical Sci 2018;22(1):11-5.
17. Saboo A, Bennett I. Trends in non-lactation breast abscesses in a tertiary hospital setting. Aus New Zeland J Surg 2018;88(7-8):739-44.
18. Boakes E, Woods A, Johnson N, Kadoglou N. Breast infection: a review of diagnosis and management practices. Eur J Breast Health 2018;14(3):136–143.