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ORIGINAL RESEARCH

Comparative study between ultra sonography guided needle aspiration and incision and drainage in breast abscess

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ABSTRACT

Aims and objectives: (1) To study the effectiveness of ultrasound guided aspiration of breast abscess in management of breast abscess. (2) To study the effectiveness of incision and drainage of breast abscess in management of breast abscess. (3) To compare the effectiveness and outcome of ultra-sonography guided needle aspiration with incision and drainage in management of breast abscess in terms of procedure time, healing time, hospital stay, post-operative pain and cosmetic output.

Material and methods: A prospective study was conducted at Sheth L.G Hospital, Maninagar, Ahmedabad. Among these 60 patients, 30 had undergone aspiration of the breast abscess (group A) and 30 had undergone incision and drainage of the breast abscess (group B).

Results and conclusion: Our study Ultra Sonographic guided needle aspiration is superior to incision and drainage in term of Hospital Stay Time, Procedure Time, Cosmetic Output and Post Operative Pain; Needle aspiration doesn't require any kind of anesthesia so patient can be managed OPD based also. Some patients don't respond to multiple aspiration, so they were managed with incision and drainage

INTRODUCTION

Breast abscess is defined as an acute inflammatory lump which yields pus on incision/aspiration.[i] It is a common staphylococcal soft tissue infection which is characterized by localized pain, swelling, and redness associated with a mass that may or may not be fluctuant.[ii]

Lactational breast abscess occurring during breast feeding is the result of Staphylococcus infection. Such abscesses tend to occur at the commencement of breast feeding when an inexperienced mother developed cracked nipples. They also occur at weaning when engorgement results from incomplete drainage of breast milk.[iii,iv] Risk factors for lactational breast abscess are primipara, gestational age >40 weeks and history of mastitis.

Non-lactational breast abscesses are entirely different from those occurring during breast feeding. They occur in the peri-areolar tissues, frequently recur, and infecting organisms are a mixture of Bacteroides, anaerobic streptococci, and enterococci. Such non-lactational breast abscess is a manifestation of duct ectasia/periductal mastitis and is usually seen in the age group 30-60 years.

The traditional management of breast abscess was incision and drainage,[v] but significant morbidity was associated with the procedure. Moreover, this is an inpatient procedure and patients are exposed to the risks of general anesthesia. The treatment of the breast abscesses shifted from a conventional approach incision and drainage to a more conservative approach needle aspiration in the recent years. It is recently reported that multiple needle aspirations with antibiotic coverage as an outpatient procedure is an effective alternative in the treatment of smaller breast abscesses. The aspiration of the breast abscess was undertaken with or without the use of ultrasound. The studies also concluded that needle aspiration is a cost-effective method.[vi] Our hospital registers approximately 100 -120 patients with a diagnosis of breast abscess every year, out of which 80-90 are lactational breast abscesses. The purpose of our study is to compare the outcome of needle aspiration in the management of breast abscess with incision and

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drainage.

My aims and objectives are:

To study the effectiveness of ultrasound guided aspiration of breast abscess in management of breast abscess.

To study the effectiveness of incision and drainage of breast abscess in management of breast abscess.

To compare the effectiveness and outcome of ultra-sonography guided needle aspiration with incision and drainage in management of breast abscess in terms of procedure time, healing time, hospital stay, post-operative pain and cosmetic output.

MATERIAL AND METHODS

Nature of study: Prospective Randomized Study
Duration of study: June 2019 to Nov 2021
Study Conducted in Sheth L.G Hospital, Maninagar, Ahmedabad

Inclusion Criteria:

1. Abscess size ≤ 10 cm in diameter
2. Patient's age between ≥ 20 and ≤ 45 years

Exclusion Criteria:

1. Patients with immunocompromised state
2. Inflammatory CA of Breast
3. Tubercular abscess
4. Galactocele
5. Chronic granulomatous mastitis
6. Recurrent breast abscesses
7. Ruptured abscesses
8. Complicated abscesses presenting with skin changes, ulceration and necrosis

Sample size: 60
Group A: 30
Group B: 30

This Patients data was collected from patients who came in OPD in Sheth LG Hospital, Maninagar and admitted in ward with chief complain of painful swelling in breast. Total 60 female patients were examined whose age is between 20 to 45 and diagnosed as breast abscess with size less than 10cm size on ultrasonography. They were included in this study with their consent.

Among these 60 patients, 30 had undergone aspiration of the breast abscess (group A) and 30 had undergone incision and drainage of the breast abscess (group B).

The patients were diagnosed clinically by taking history of duration of abscess, site, nature and past history of abscess. General examination done including vitals, pulse rate, blood pressure, oxygen saturation and body temperature were recorded. Detailed local examination of breasts was carried including temperature, tenderness, and discharge from the nipple.

NEEDLE ASPIRATION

After Clinically confirming the breast abscess, ultrasonography of breast abscess was done and location and diameter of Abscess cavity measured, needle aspiration procedure explained to patient and relative and consent has been taken. Painting at local site done using Betadine solution and draping done. Needle Aspiration done using 18G needle and 20cc Syringe.

Breast fixation done by holding it in between thumb and Index finger of one hand. Abscess was localized and under Ultrasonographic guidance needle were inserted and tip of the needle confirmed inside cavity. Aspiration of pus started using 20cc Syringe, Syringe detached and collected pus send for Culture and sensitivity, this procedure carried out till no pus aspirated. Residual pus cavity size measured and this procedure repeated alternate day till whole pus cavity were drained out or 3 times Aspiration were performed and if still residual pus is present after 3 times aspiration, then this will count failure of this procedure and it is managed further by Incision and Drainage.

The time required for the procedure in aspiration was calculated as soon as the surgeon has started the procedure of aspiration by stabilizing the abscess till no pus is aspirated. The puncture site is sealed with tincture benzoin application.

Oral amoxicillin + clavulanic acid and analgesics were given to the patient.

INCISION AND DRAINAGE

The abscess was incised near the areolar margin and along skin lines under general anesthesia. All pus was evacuated, and loculi were broken down digitally or by using the artery forceps. The pus drained was sent for culture sensitivity. The wounds were left open to drain and dressed daily until the wound was clean and granulated. The healing time in this group was the time from incision and drainage to wound closure either by secondary intention or by secondary suturing if required. The time required for the procedure in incision and drainage is calculated when the surgeon stabilizes the breast for incision to be taken till the final dressing application.

Injection Amoxicillin + clavulanic acid was given to the patient on the day of surgery and shifted to oral medications on discharge.

All patients stayed for 2-3 days in the hospital.

Patients from both groups were given antibiotics for a period of 7 days.

Breast feeding from the opposite breast was encouraged in both the groups along with expression of milk from the same side.

Clinical assessment of the patients about resolution of the abscess was then performed. For the incision and drainage group, dressing of the wound was done every day till the wound healed. For the aspiration group, re-aspiration was performed if abscess had not subsided. Failure of aspiration in three episodes was regarded as failure of the procedure and abscess was incised.

The postoperative pain was graded according to the

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numeric rating scale on every alternate day as 0-no pain,1-3 mild pain, 4-6 moderate pain and 7-10 severe pain.

The healing time was calculated from the day of intervention till the day the abscess was completely healed. Complete healing was defined to be complete resolution of abscess on follow up ultrasonography scan in the aspirated group and that the incised group was from the day of intervention till the wound healed. The healing of wound was by secondary intention or by secondary closure on follow up days. The patients were assessed cosmetically on the basis of scar present or absent and the cosmetic acceptability of the scar was not studied.

RESULTS

Age distribution

We did study on total 60 patients which belongs to different age groups, 20 year is lowest age in my study group and 45 year is highest age. Here average age in group A is 25 and in Group B is 27. In our study breast abscess involvement on left side of breast (38) is higher. Most common quadrant involve in breast abscess in our study is upper outer quadrant. Manny time abscess involves more than one quadrant in this case we had seen the size of abscess, we had considered quadrant whose size is larger. In our study we had observed that primigravida women are more affected (58.3%) than multigravida (41.6%), reason behind that is lack of experience of breast feeding, and proper knowledge of baby position and nipple areola hygiene and care. By the time of treatment 90% of the cases were lactating and non-lactating are 10% in both the groups hence the difference was not significant.

In our study we noticed that patients whose mode of delivery is through Cesarian Section is affected slightly more than Normal Vaginal Delivery (NVD) patients. It might be due to late starting of breast feeding in those patients who went for Cesarian Section, Because of operative procedure, Post Operative anesthesia effect and pain will lead discomfort to mother and that's why mother is not effectively and adequately breast feed her baby and it might be the reason for development of mastitis and Breast abscess. But there is no any study reported who proves this observation.

Mean duration of pain was 5.6 days among Group A which was less than Group B (5.7 days), but the difference was not significant.

Fever was observed totally in 29 patients (48.33%). In aspirated group, fever was complained in 11 patients (36.66%). The mean duration of fever was 2.36 days. In the incised group, fever was complained in 18 patients (60%) for an average of 3.61 days. This difference between groups was not significant.

Ultrasonography is used as diagnostic test for breast abscess and it will measure the accurate dimensions of the abscess and site. The mean size of the abscess cavity was 63*40mm in Group A as compared to 63*45mm in Group B and this difference was statistically not significant. The mean volume of pus aspirated was 62 cc in Group A as compared to 59 cc in Group B but this difference was not statistically significant.

After Aspiration of Pus or drainage of Pus, Collected Pus will send for culture sensitivity. The CS report shows growth in 45 patients (75%). Staphylococcus aureus growth is encountered in 40 patients (66.6%). Out of that 22 were in the aspirated group and 18 in the incised group. 5 patients had growth of Streptococcus Pyogens (8.3%). Out of that 1 were in the aspirated group and 4 in the incised group. Pus did not show any growth in the rest of the patients (15). The statistical difference betwee the two groups was not significant.

The mean duration of time taken for procedure and duration of stay as compared between the groups and the difference was statistically significant for both. In needle aspiration as it is done without anesthesia and requires only few minutes while in Incision and Drainage as this procedure is done under GA it will require more time compare to Aspiration. 10 patients required only a single aspiration, 14 required two aspirations, 3 patients required 3 aspirations. 3 patients still had a residual abscess after 3 aspirations and were declared as treatment failure and were managed by incision and drainage.

The mean healing time was 3 days in Group A which was significantly less as compared to 9 days in Group B.

DISCUSSION

In our comparative study, we compared two groups, ultrasonography guided needle aspiration and incision and drainage in the management of breast abscess. Age range in our study has some kind of similarity with already done study named Dixon J ; [vii] and Dener C and Inan A,[viii] they had demonstrated that most commonly affect women aged 20-45 years in breast abscesses.

In our study 58.3 % patients were primiparae and 41.7% were multiparae, a similar incidence has been described by Dener C and Inan A.[8] This literature is also showing similar finding, which describes that here is greater risk to development of breast abscess in Primipara women than multipara women.[ix]

Breast abscess is frequently located in the upper and outer quadrant, which fits with the fact that most of the breast parenchyma is located in this quadrant.[x] In our study, 71.6% of breast abscess was found in the upper and outer quadrant and 63.3% of breast abscess was located in the left breast. Similar result is also documented in Eryilmaz R et al[xi] and Chandika AB et al[xii] report. There is peripherally located abscess were more in our study than centrally locating abscess which was consistent with the results of Hamid HS and Osama MI .[xiii]

In our study all the patients presented with pain as a general symptom. The mean duration of pain in our

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study was 5.6 days. However, the incidence of fever was in 29 patients (48.33%). These observations are similar with the findings of Dener C and Inan A.[8]

In our study the culture-sensitivity reveals the presence of S. aureus and S. pyogenes. We have 45 (75%) patients who had S. aureus positive reports; of which 22 (36.6%) patients were in aspirated group and 18 (30%) patients were in the incised group, and S. pyogenes were total 5 (8.33%); out of which 1 (1.66%) patient was in aspirated group and 4 (6.66%) patients were in the incised group. Singh G et al[xiv] and Elagili F et al[xv] shows similar findings.

The mean time required for both the procedures was assessed. From the results it was observed that patients undergoing aspiration required 4.3 minutes which was significantly less as compared to the mean time required for the procedure for patients undergoing incision and drainage, which was 19.5 minutes confirming that needle aspiration is very feasible, simple procedure.

In the present study, the mean diameter of the abscess was 63*45 mm in total patients. The mean volume of pus aspirated in aspirated group was 62 ml and that in the incised group was 59 ml. There was no significant difference in the mean amount of pus aspirated or drained in these two groups. These results were in contrast with the studies of Schwartz et al[xvi] and Hamid HS and Osama MI.[13]

In the Present study, 54 patients belonging to Lactational group; out of 54 (90%) patients 25 (46.3%) patients' mode of delivery is Normal Vaginal Delivery while 29 (53.7%) patients were LSCS. While 6 (10%) patients were belonging to non- lactating group.

In our study of the 30 patients who underwent aspiration, 27 were treated successfully without any complication on follow up. The success rate achieved was 90%. This was comparable with the study conducted by O'Hara et al reported an 86% cure rate.[xvii]

In this study aspiration failure was found in 10% (3 patients). Incidence similar to our study was reported by O'Hara et al.[17]In our study all the patient's undergone ultrasonography to assess the size and location of breast abscess and to confirm the diagnosis of breast abscess, though it was diagnosed clinically. Ultrasonography was also useful tool in diagnosis of breast abscess as found in study done by Dener C and Inan A.[8]

Post operatively clinical symptoms like pain were assessed in the patients of breast abscess treated with aspiration and with incision and drainage. At the end of day 10, we observed 93.33% of the patients in aspirated group got relief from pain whereas in the incised group 86.66% of the cases had no pain. Wound healing was significantly faster in the aspirated group than in the incised group (3 days versus 9 days), this finding was similar to the study done by Elagili F et al.[15]

In our study we had measured cosmetic outcome based on patient's satisfaction and scar mark. Patients underwent with aspiration, were satisfied with the cosmetic outcome, as there were no scars present after the treatment as similar to the studies of Singh G et al[14] and Kastrup S et al.[xviii]

CONCLUSION

We did detail study on total 60 patients of breast abscess by keeping our aim and objective in the mind. Here, our study Ultra Sonographic guided needle aspiration is superior to incision and drainage in term of Hospital Stay Time, Procedure Time, Cosmetic Output and Post Operative Pain;

Needle aspiration doesn't require any kind of anesthesia so patient can be managed OPD based also. Some patients don't respond to multiple aspiration, so they were managed with incision and drainage.

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