International Journal of Medical and Health Research
www.medicalsciencejournal.com
ISSN: 2454-9142
Received: 05-03-2021, Accepted: 23-03-2021, Published: 23-04-2021
Volume 7, Issue 4, 2021, Page No. 28-33

Comparative study of conventional incision and drainage with gauze packing versus incision and drainage with curettage and primary closure of breast abscess

Kartik Saxena[1*], MK Maheshwari[2], Sandeep Kansal[3], Bhavya[4]

[1] Post Graduate Resident, Department of Surgery, Subharti Medical College and Hospital, Meerut, Uttar Pradesh, India

[2] Professor and Head, Department of Surgery, Subharti Medical College and Hospital, Meerut, Uttar Pradesh, India

[3] Professor, Department of Surgery, Subharti Medical College and Hospital, Meerut, Uttar Pradesh, India

[4] Senior Resident, Department of Surgery, Subharti Medical College and Hospital, Meerut, Uttar Pradesh, India

Abstract

Breast abscess is a common surgical condition [1]. It is a collection of pus that has accumulated within a tissue because of an inflammatory process in response to either infectious process or foreign material. The established principle of surgical management of abscess has been incision and free drainage; or treatment by secondary closure [17]. This modality of treatment has been challenged with the introduction of antibiotics. This prospective study was conducted over a period of 21 months in the Department of Surgery, Chhatrapati Shivaji Subharti Hospital, Patients in Group A were treated by incision and drainage with primary closure and a closed suction drain was placed and patients in Group B were treated by incision and drainage with gauze packing only, 60 patients, out of which maximum subjects were from the age group of 21-30 year. Most common causative organism was S. aureus reported among 36.67% of the subjects. Primary closure of breast abscesses is associated with less postoperative pain, decreased hospital stays, faster healing, lower recurrence rate, and more acceptable scar.

Aim: To compare conventional incision and drainage with gauze packing versus incision and drainage with curettage and primary closure of drainage of breast abscess.

Keywords: conventional incision, drainage, gauze packing versus incision, drainage, curettage

Introduction

An abscess is a common surgical condition [1]. It is a collection of pus that has accumulated within a tissue because of an inflammatory process in response to either infectious process or foreign material [2]. Clinically it is a painful fluctuant soft tissue mass surrounded by firm granulation tissue and erythema [3, 4, 5]. Subcutaneous abscess is typically poly-microbial in nature. Staphylococcus aureus and group A beta-hemolytic streptococci are most commonly involved aerobic microorganisms. Commonly isolated anaerobes include Bacteroides, Pepto-cocci and Pepto-streptococci. Staphylococcus aureus is most commonly involved organism [6].

Breast abscess is an acute inflammatory process resulting in the formation and collection of pus under the skin in breast tissue. Typically, there is painful erythematous mass formation in the breast occasionally with draining through the overlying skin of nipple duct opening. Breast abscess if not treated in time and in proper way, can result in deformation of breast [7] The patient will usually provide a history of breast pain, erythema, warmth, and possibly edema. It is also important to ask about the patient's medical history, including diabetes. The majority of postpartum mastitis are seen within 6 weeks of while breast-feeding. Acute septic breast infections usually occur during the 2nd week of the puerperium, in a breast which is either engorged, or has a cracked nipple. As soon as there is a definite lump or the presence of pus found by aspiration, we must surgically drain the pus.

On examination, the patient will have erythema, induration, warmth, and tenderness upon palpation at the site in question. It may feel like there is a palpable mass or area of fluctuance.

Breast infections are occasionally seen in neonates but most commonly affect women aged between 18 and 50 years and are categorized as lactational and non-lactational infections. Sonography has become an important diagnostic modality in the diagnosis of breast abscess which differentiates between mastitis and abscess. [10, 11] Non-lactational abscesses can be classified as central, peripheral or, the skin associated. Patients presenting with non-lactational abscesses are more likely to develop recurrent infections, especially, in a state of diabetes mellitus.

The established principle of surgical management of abscess has been incision and free drainage; or treatment by secondary closure [8]. This modality of treatment has been challenged with the introduction of antibiotics The standard surgical approach (invasive) of incision and drainage (I&D), breaking loculi and insertion of a drain under general anesthesia or daily gauze packing has yielded to minimally invasive approach of percutaneous placement of drain

Materials and Methods

This prospective study was conducted over a period of 21 months in the Department of Surgery, Chhatrapati Shivaji Subharti Hospital,

Inclusion Criteria

Diagnosis of breast abscess made clinically.

Female patients presenting with breast abscess

Patients in age group 15 years - 55 years giving consent for the study.

Exclusion Criteria

Breast abscess associated with chronic co-morbid conditions affecting wound healing like Diabetes mellitus, malignancies.

Patient's age less than 15 years and more than 55 years.

Methodology

All patients presenting to the general surgery OPD & emergency with a clinical diagnosis of breast abscess. Patients were admitted to the In-patient Department of surgery. Post-operative data were collected and was analyzed using Chi-square test. Patients in Group A were treated by incision and drainage with primary closure and a closed suction drain was placed and patients in Group B were treated by incision and drainage with gauze packing only.

Operative Procedure

1. Anesthesia: breast abscess incision and drainage was performed under general anesthesia with intubation and controlled ventilation.
2. Part preparation: the affected breast was painted with 10% povidone iodine solution and draped with sterilized sheets.
3. Skin and superficial fascia were incised either at the cutaneo-areolar margin or directly over the most prominent part of the abscess depending on the location of the abscess. A long artery forceps was driven into the cavity. All loculi and galactoceles that were felt were entered, a finger was introduced and any remaining loculi were broken. Pus aspirated was sent for culture and sensitivity.
4. In group A, the pyogenic membrane in abscess cavity was curetted the cavity was irrigated using normal saline. A negative suction drain was placed in the most dependent part of the abscess cavity by a counter incision and fixed. The primary incision was then closed using simple interrupted sutures using polyamide 2-0 and a pressure dressing was applied.
5. In group B, after incision and drainage, a gauze packing soaked in 10% povidone iodine was packed into the cavity and a firm dressing was applied on the wound.

Fig 1: Signs of local inflammation in a case of lactational breast abscess

Fig 2: Circumareolar incision

Fig 3: Puncturing abscess cavity with artery forceps

Fig 4: Drain in situ in abscess cavity after incision and drainage and irrigation

Post-Operative Management

Antibiotics were changed according to culture and sensitivity reports as were made available. Dressings were changed on alternate days in patients of group A and daily in group B, also depending on how soaked the dressings become. Patients in both groups remained ambulatory during the postoperative period. In group A, drain was removed when the discharge was minimal and sutures were removed according to the wound condition. In group B, gauze packing was changed daily for at least 3 days and stopped when soakage became minimal and clean granulation tissue was noticed in the abscess cavity.

Follow Up

Patients were evaluated on a weekly basis after discharge on OPD basis for a period of 1 month. The patients were evaluated for recurrence, complications, wound condition and scar formation. The data was collected and subjected to comparative study.

Observation and results

The present prospective comparative study was conducted in the department of General Surgery, Subharti Medical College and Hospital among 60 females between age group 15 to 45 years. The study population was divided between 2 groups, with 30 patients in each group. Patients in Group A were treated by incision and drainage with primary closure after a closed suction drain was placed; patients in Group B were treated by incision and drainage with gauze packing. The results of the study are summarized as follows:

1. In this study, total number of women enrolled were 60,out of which maximum subjects were from the age group of 21-30 years (40%) followed by 31-40 years (28.33%) in both the groups, thus showing that breast abscess mostly occurs in lactational age group.
2. In group A, maximum subjects were from lower SES (40%) followed by lower middle (33.33%) SES, while in group B, maximum subjects were from lower middle (43.33%) SES followed by lower (33.33%) SES. This study concluded that most patient of breast abscess belonged to lower socioeconomic status.
3. In this study, pain, swelling, fever and discharging sinus was reported among 100%, 93.33%, 90%, 20% and 100%, 96.675, 86.67%, 16.67% of the subjects respectively.
4. In this study, lactation history was found among 66.67% and 76.67% of the subjects in group A and B respectively and was found to be a significant factor in occurrence of breast abscess.
5. This study also showed that most commonly abscess was found among right side of the breast in group A (66.67%) as well as group B (70%). Bilateral abscess was revealed in 6.67% and 10% of the subjects in group A and B respectively.
6. In this study, it was observed that Upper outer, lower outer, upper inner and lower inner quadrant were involved in 53.33%, 26.67%, 16.67%, 3.33% and 60%, 23.33%, 10%, 6.67% of the subjects in group A and B respectively.
7. In this study, most common causative organism was S. aureus reported among 36.67% of the subjects. Pseudomonas aeruginosa and Proteus mirabilis as causative organism was revealed only in 8.33% of the subjects.
8. In this study mean operating time required was comparatively more in group A (29.12 min) as compared to group B (26.47 min) with statistically insignificant difference as $p>0.05$.
9. In this study mean number of dressings required was comparatively more in group B (14.31) as compared to group A (3.68) with statistically significant difference as $p<0.05$.
10. In this study mean duration of analgesia was comparatively more in group B (13.34) as compared to group A (6.03) with statistically significant difference as $p<0.05$.
11. Mean days required for removing drain and suture was 4.14±1.17 and 8.09±1. 48 days in group A.
12. In this study mean duration of hospital stay (in days) was comparatively more in group B (9.59 days) as compared to group A (5.32 days) with statistically significant difference as $p<0.05$.
13. In this study mean duration of wound healing time (in days) was comparatively more in group B (24.98 days) as compared to group A (9.07 days) with statistically significant difference as $p<0.05$.
14. Recurrence of breast abscess was reported in 3 (10%) and 5 (16.67%) cases of group A and B respectively. When recurrence of breast abscess was compared statistically among group A and B, it was found to be statistically insignificant as $p>0.05$.

Table 1: Causative organism in breast abscess among the study groups

Causative organism	Group A (N=30)		Group B (N=30)		Total	
	N	%	N	%	N	%
Staphylococcus aureus	10	33.33	12	40	22	36.67
Coagulase-Negative Staphylococcus	5	16.67	4	13.33	9	15
Diphtheroids	6	20	7	23.33	13	21.67
Pseudomonas aeruginosa	3	10	2	6.67	5	8.33
Proteus mirabilis	2	6.67	3	10	5	8.33
Other Isolates	4	13.33	2	6.67	6	10

Table 2: Comparison of total number of dressings among the study groups

Group	Total Dressing	
	Mean	SD
A	3.68	1.71
B	14.31	2.91
t test	19.47	
p value	<0.01	

Table 3: Recurrence of breast abscess among the study groups

Recurrence	Group A (N=30)		Group B (N=30)	
	N	%	N	%
Yes	3	10	5	16.67
No	27	90	25	83.33
Chi Square	1.78			
p value	0.19			

Recurrence of breast abscess was reported in 5 (16.67%) and 3 (10%) cases of group B and A respectively. When recurrence of breast abscess was compared statistically among group A and B, it was found to be statistically insignificant as p>0.

Fig 4: Post op day 3 of patient of primary closure

Fig 5: Post op day 3 of lactational breast abscess treated with I&D with gauze packing

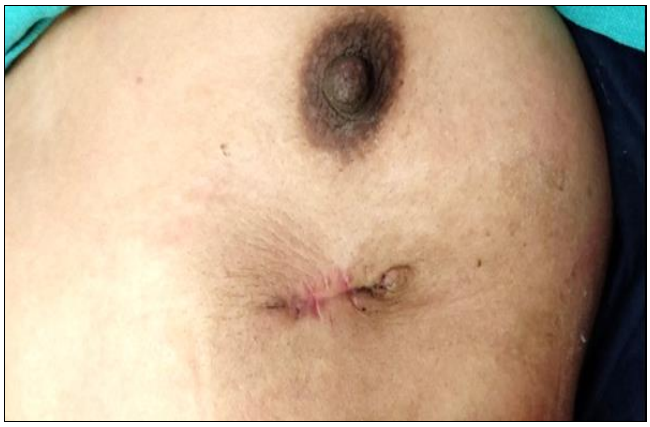

Fig 6: Scar after suture removal in primary closure

Discussion

Cutaneous abscesses are responsible for a major number of emergency department visits and incidence is increasing. In the past a basic surgical principle has been that a highly contaminated or infected wound should never be closed by primary intention. According to Haagensen "The conventional treatment of breast abscess has been surgical incision and drainage under general anesthesia, a curved incision in the skin line is used and a Penrose drain is left in a place for 72 hours". The gold standard of puerperal breast abscess drainage described by Haagensen is supported by Webster with addition of gauze packing. [9] Hence this study was conducted to compare conventional method of incision and drainage with gauze packing versus primary closure with negative suction drain in treatment of breast abscess in terms of different aspects including duration of treatment and quality of outcome.

Organism

In our study, most common causative organism was Staphylococcus Aureus reported among (n=22)36.67% of the subjects. This study also reveals that only (n=5)8.33% patients had pseudomonas infection and another (n=5)8.33% patients had proteus mirabilis infection thereby indicating its less prevalence as compared to staph aureus.

Amandeep Singh *et al*. [4] in their study found that staph aureus was most common organism involved in abscess.

In a study by Vishvanathan *et al*. [10] showed that coagulase positive S. aureus was isolated from 69% of the cultures obtained and 21% of the cultures were sterilized from abscesses. [4]

In this study mean operating time required was comparatively more in group A (29.12 min) as compared to group B (26.47 min) with statistically insignificant difference as $p>0.05$

To the best of our knowledge no other study has compared the difference in operating time of open incision and drainage vs primary closure of breast abscess.

Dressings

In this study mean number of dressings required was comparatively more in group B (14.31) as compared to group A (3.68) with p-value <0.01 with statistically significant difference as $p<0.05$.

Aditya Gundu *et al* [50] in their study reported that mean no of dressings in open method were more in open method (16.32±2.1) than closed method (4.5±o.9) and this difference was statistically significant. These findings were in accordance with our study.

Analgesia

In this study mean duration of analgesia was comparatively more in group B (13.34) days as compared to group A (6.03) days with statistically significant difference as $p<0.05$.

Similar results were reported by Aditya Gundu *et al*. in their study [11] i.e. duration of analgesia in open method was higher (12.48±1.6days) than closed method (8.2±08days).

Drain and Suture Removal

Mean days required for removing drain and suture was 4.14±1.17 and 8.09±1. 48 days in group A in our study.

Kuntal Surana *et al*. [12], in their study reported that the drain removal ranges from 3 to 16 days. In majority, drain removal was on day 7 (52.63%) and day 10 (23.68%). Only in 15.79% cases that it was removed on the 5th day. The mean for drain removal was 7.7 days. The suture removal ranges from 3 to 16 days with a mean of 12.03 days.

Duration of hospital stay (in days)

In our study, the mean duration of hospital stay (in days) was comparatively more in group B (9.59 days) as compared to group A (5.32 days) with p-value of <0.01 which is statistically significant. Hence, mean hospital stay was significantly less in primary

The mean hospital stay period is 4.18 (range 2–10 days) as mentioned in a study by Kuntal Surana *et al*. [12].

Recurrence

In this study, the recurrence of breast abscess was reported in 3 (10%) and 5 (16.67%) of cases of group A and B respectively with a p-value of 0.19 which was found to be statistically insignificant.

Similar finding was seen in another study conducted by Khanna Y.K. et al [13] among 100 cases of injection abscesses managed by primary closure technique. No patient in the series had second time anesthesia for a recurrent abscess in the same wound. [4]

Limitations of This Study

1. Small number of sample size which can be attributed to increased awareness among patients and availability of good broad-spectrum antibiotics at primary healthcare centers.
2. Other modalities of treatment of breast abscesses such as percutaneous drainage and repeated aspirations were not included in the study.

Thus, in present study, it was observed a significant difference in postoperative pain, duration of hospital stay, number of dressings required, wound healing time, and scar cosmesis between two groups thus saving the lengthy nursing care and hospital expenses in patients treated with primary closure as compared to patients managed by conventional incision and drainage of breast abscess.

Conclusion

Primary closure of breast abscesses is associated with less postoperative pain, decreased hospital stays, faster healing, lower recurrence rate, and more acceptable scar and thus may be recommended as a standard treatment compared to

the conventional technique of incision and drainage which is associated with more painful dressing, increased hospital stay and visits, need for more antibiotic therapy, increased wound healing time, and poorer scar due to healing by secondary intention

Reference

1. Townsend CM Surgical Infections and Choice of Antibiotics. Sabiston Textbook of Surgery: the biological basis of modern surgical practice. Saunders Elsevier, Philadelphia; 2007:299-327.
2. Edino ST, Ihezue CH, Obekpa PO Outcome of primary closure of incised acute soft tissue abscesses. Nigerian Postgraduate Medical Journal. 2001;8:32-6.
3. Thomas W Basic surgical skills and anastomosis. In: Williams NS, Bulstrode C, O'connell P. Bailey and Love's Short Practice of Surgery, 26th Ed. CRC, London; 2013;53-55.
4. Singh A, Singh G, Sidhu DS, Bhalla M. Conventional incision and drainage versus incision and drainage with primary closure in acute abscess: a prospective study. International Surgery Journal. 2017 Dec 26;5(1):281-5.
5. Ruiz LP, Strain EC, John G. The substance abuse handbook. Wolters Kluwer Health/Lippincott Williams and Wilkins Philadelphia; 2007:373.
6. Raju SR. Analytical study of drainage of breast abscess by open drainage with primary suturing with negative suction drain and conventional incision and drainage. International Journal of Surgery. 2019;3(3):397-9.
7. Hayes R, Michell M, Nunnerly HB. Acute inflammation of breast- the role of breast ultrasound in diagnosis and management.Clinical Radiology 1991; 44:253–256.
8. Sam Vivek G, Sankararaman B. A comparative study of open drainage versus suction drainage and primary closure in the management of breast abscess at a tertiary care center. International Journal of Surgery. 2020; 4(2):280-2.
9. Abhishek Singh N. Breast Abscesses: Recent Concepts in the Etiology, Diagnosis and Treatment. Surgery and Case Study Open Access Journal.2019; 2 (2)-131.
10. Visvanathan R. Primary Closure Following Drainage of the Rectus Sheath Muscle. Singapore Medical Journal. 1994;35:108-9
11. Gundu A, Degloorkar GG. A study of open versus closed method of drainage of breast abscess. MedPulse Research and Publication 2018; 7(1): 1-3.
12. Surana K, Sagrule D, Lanjewar S. Primary closure with suction drain of acute breast abscess after incision, drainage, and curettage. Indian Journal of Surgery. 2020 Apr; 82(2):129-33.
13. Khanna YK, Khanna A, Laddha BL, Prasad P, Jhanji RN. Primary closure of breast abscess (a study of 50 cases). Indian journal of medical sciences. 1984 Oct; 38(10):197.