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Original Research Article

A Prospective Comparative Observational Study to Evaluate Open versus Closed Method of Drainage of Breast Abscess

Abhishek Sinha[1], Abhishek Kumar[2], Puja Kumari[3]

[1]Senior Resident, Department of General Surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India.

[2]Senior Resident, Venkateshwar Hospital, Dwarka, New Delhi, India.

[3]Assistant Director, Department of Paediatric Cardiology, IGIC, Patna, Bihar, India.

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Corresponding Author: Dr. Puja Kumari
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Abstract

Aim : The aim of the present study was to compare open versus closed modalities of treatment of breast abscess and to isolate the commonest organism responsible for breast abscess.

Methods : A cross sectional prospective study was designed to compare the breast abscess cases (both open and closed) admitted in Department of Surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India for a period of 2 years. A total of 200 cases were selected for the study and divided into two groups - open group and closed group.

Results : Maximum number of cases i.e. 120 (60%) were observed in the 15-25 yrs of age group followed by patients in 26-35 years of age group (20%). In the present study, pain was present in 100% of patients, 96% patients had swelling and 8 (3%) patients complained of history of fever on presentation. Out of 92 cases operated by open method, 64% cases were lactating mothers, while 36% cases were non-lactating. Abscess on right side was more common (64%) than on the left side (36%). Maximum number of patients 116 (58%) had breast abscess in the upper outer quadrant followed by 50 (25%) cases in the lower outer quadrant, 26 (13%) cases in the upper inner quadrant and 8 (4%) case in the lower inner quadrant. The total number of dressings in the open category was 16.44, whereas in the closed category it was 3.38. Among the total cases, total recurrence was seen in 20 (10%) cases from which 6 (6%) cases in open group and in 14 (14%) cases in closed group.

Conclusion : Dressing in conventional method is painful and causes discomfort to the patient. Primary closure technique has a major drawback of failure but the failure rates are acceptable. The duration of hospital stay and nursing care was less in primary closure technique as compared to open method of treatment.

Keywords : Breast abscesses, Open method, Primary closure technique, Staphylococcus aureus.

Introduction

Breast abscess is an acute inflammatory process resulting in the formation and collection of pus under the skin in the breast tissue. Typically, there is a painful erythematous mass formation in the breast with occasional draining through the overlying skin of nipple areola complex. Breast abscess if not treated in time and in proper way can result in deformation of breast which ultimately can result in loss of self-esteem of the female who suffers from it. For the treatment of the breast abscess, options include repeated aspiration, incision and drainage, incision and drainage with primary closure or conservative treatment by giving antibiotics. The incidence of breast abscesses in lactational mastitis ranges from 0.4 to 11% in Indian subcontinent. [1] Risk factors for lactational breast abscess are primipara, gestational age > 40 weeks and history of mastitis. A stage of mastitis precedes abscess formation. Sonography has become an important diagnostic modality in the diagnosis of breast abscess which differentiates between mastitis and abscess. [2]

The established principle of surgical management of abscess has been incision and free drainage followed by secondary closure. [3] This modality of treatment has been challenged with the introduction of antibiotics. Ellis taught that the abscess wall prevented access to the abscess cavity and that if this wall was curetted away the cavity could fill with antibiotic laden blood clot preventing safe primary closure. The primary closure technique is supported by many surgeons who showed its effectiveness in the treatment of breast abscess. Advantages of primary closure technique are faster healing rate,

less hospital stay and early return to work, lesser recurrence than the conventional method, better scar healing and finally reduced cost of labour and material and may be recommended as an alternative treatment which is superior to the orthodox technique. [4]

Breast abscesses have traditionally required a surgical incision to allow drainage of the abscess which is usually performed under general anesthesia followed by administration of antibiotics. [5] Breast abscesses are more frequently observed in nonpuerperal mastitis than in puerperal mastitis and can be a particularly difficult condition due to the intense discomfort and tendency for recurrence. Breaking down the loculi and draining the pus material from the cavity by incision of the swelling is the most common method followed by irrigation and cavity is either left open and packed with gauze or approximated around a drain. [6] Surgical incision and drainage is the gold standard treatment. So the technique which should be used for the treatment depends on preference and experience of the treating surgeon. The aim of the present study was to compare open versus closed modalities of treatment of breast abscess and to isolate the commonest organism responsible for the breast abscess.

Materials and Methods

A cross sectional prospective study was designed to compare the breast abscess cases (both open and closed) admitted in the Department of Surgery, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India for a period of 2 years. A total of 200 cases were selected for the study and divided into two groups - open group and closed group. Out of 200 patients, 100 were allocated in the open group which were treated by incision and drainage followed by packing and the remaining 100 cases were allocated in closed group, treated by primary closure technique with a drain in situ.

All breast abscess cases with the overlying skin of abscess intact were included in the study and the exclusion criteria were skin necrosis where primary suturing is not possible, burst open abscesses, multiple abscesses, recurrent abscesses after a previous surgical drainage, abscesses associated with underlying malignancy, tuberculosis etc. and associated co-morbid conditions like Diabetes Mellitus, HIV, Hepatitis - B etc.

Detailed history was taken regarding complaints, duration, severity, onset of symptoms, mode of onset, progression of symptoms, change in pattern at the time of presentation. Enquiries were made about history of diabetes and immuno-compromised state. Patient were also asked about personal habits regarding diet, sleep, bowel and bladder habits. Detailed history was taken regarding lactational status of the patient, parity of the patient and similar past history. Detailed general physical examination was done regarding built, nutritional status, hydration, general appearance and presence of systemic illness. Vitals signs were recorded in each case. Systemic examination was done to rule out any systemic disease.

Thorough local examination was done by inspection and palpation of the breast with the status of the regional lymph nodes. Routine blood and urine investigations were done in all cases. All cases were screened for HIV and Hepatitis - B for the safety of the medical personal and if found positive those cases were excluded.

All patients received a loading dose of antibiotic (inj. Amoxicillin + Clavulanic acid 1.2 gms intravenous), 1 hr before the contemplated procedure. Patient should be kept nil orally for 5 to 6 hours before the procedure. All abscesses were drained under short general anaesthesia or general anaesthesia depending upon age and general condition of the patient and site of abscess. Stab incision was made over the most prominent and most dependent part of the abscess cavity. A pair of artery forceps or sinus forceps was forced into the abscess cavity, the blades are gradually opened and pus was extruded out. Pus was collected using a sterile swab or a syringe for isolating the type of microorganisms for culture and sensitivity. Finger was then introduced into the abscess cavity to break the loculations for free drainage of pus. All the accessible purulence using external pressure, suction or irrigation was drained. Using a curette, the wall of the cavity was scraped as thoroughly as possible to remove unhealthy granulation tissue and hydrogen peroxide irrigation was given. Wound was well irrigated with copious amount of warm sterile solution.[7]

Now two different methods of packing were applied. Packing of the abscess cavity in open method (the common method) a sterile tapes, gauze or sponge was used in this method to pack the full extent of the wound after incision and drainage. Packs should be wet-to-dry dressing with normal saline, changed twice a day until the wound heals from the base up. In closed method, an alternative method to pack the abscess cavity, one can obliterate the abscess cavity by placing a negative suction drain no.16 (Romovac) inside the cavity and closing the incised wound with interrupted vertical mattress skin suture with non absorbable suture. The dressing of the wound is inspected after 24 to 48 hours after the incision and drainage procedure. Subsequent dressing was done twice a day, once daily or on alternate days depending on the soakage of the dressing and condition of the wound. Inj. Amoxicillin + Clavulanic acid 1.2 gms i.v. were given, two times a day for three days.

In open group, dressing was done till complete healing or epithelisation occurred or till secondary suturing was done. The frequency of dressing was decided upon soakage from the wound. Patients were allowed to breast feed their child from the affected breast after complete healing of abscess and were asked for review in OPD on weekly basis ; up to 6 weeks. In closed group, dressing was done once in 2 or 3 days till the healing occurred. The drain removal was done when drainage stopped coming after confirming that there is no blockage. Breast feeding from affected breast is allowed after drain removal. Suture removal was done usually on 8th or 9th post-operative day.

The cases were analysed using descriptive statistics and inferential statistics using chi-square test and z-test for difference between two means. The statistical software used in the analysis was SPSS (statistical presentation system software) version 17.0 and Graph Pad Prism 4 and the results were tested at 5% level of significance.

Results

Table 1 : Distribution of patients according to their age and different methods of packing

Age (yrs)	Open		Closed		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
15-25	62	62	58	58	120	60
26-35	12	12	28	28	40	20
36-45	2	2	12	12	16	8
45+	24	24	0	0	24	12
Total	100	100	100	100	200	100

Maximum no. of cases i.e. 120 (60%) were observed in the 15-25 yrs of age group followed by patients in more than 26-35 yrs age group (20%).

Table 2 : Distribution of patients as per their symptoms, lactation history, side of breast abscess and quadrant involved

	Open		Closed		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Symptoms						
Pain	100	100	100	100	200	100
Swelling	96	96	100	100	196	98
Fever	82	82	84	84	166	83
Lactational history						
Present	64	64	94	94	158	79
Absent	36	36	6	6	42	21
Side of breast abscess						
Right	60	60	68	68	128	64
Left	40	40	32	32	72	36
Quadrant involved						
Upper Outer	56	56	60	60	116	58
Lower outer	24	24	26	26	50	25
Upper inner	18	18	8	8	26	13
Lower inner	2	2	6	6	8	4

In the present study, pain was present in 100% of patients, 96% patients had swelling and 83% patients complained history of fever on presentation. Out of 92 cases operated by open method, 64% cases were lactating mothers, while 36% cases were non-lactating. Abscess on right side was more common (64%) then on left side (36%). Maximum number of patients 116 (58%) had breast abscess in the upper outer quadrant followed by 50 (25%) cases in the lower outer quadrant, 26 (13%) cases in the upper inner quadrant, and 8 (4%) case in the lower inner quadrant.

Table 3 : Distribution of cases according to culture report

Culture report	Open		Closed		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Coag+ Staph	70	70	72	72	142	71
No Growth	26	26	22	22	48	24
E. coli	4	4	6	6	10	5

It was found that the most common organism found was coagulase positive Staphylococci, in 142 (71%) patients. In the study in 48 (24%) cases, no organism was grown in the culture i.e. it was a sterile culture. In 10 cases (5%) E. coli species was grown in culture.

Table 4 : Total number of dressings and Duration of analgesia given

Group	Mean number of dressing	P value
Open	16.44	0.000
Closed	3.38	
Group	Mean number of days	
Open	12.08	0.000
Closed	7.6	

The total number of dressings in the open category was 16.44, whereas in the closed category it was 3.38.

Table 5 : Recurrence of breast abscess

	Open		Closed		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Recurrence	6	6	14	14	20	10
No recurrence	94	94	86	86	180	90
Total	100	100	100	100	200	100

Among the total cases, total recurrence was seen in 20 (10%) cases from which 6 (6%) cases in open group and in 14 (14%) cases in closed group.

Discussion

A breast abscess is a localized collection of pus in the breast. It usually occurs in breastfeeding women due to trauma and mastitis.[8] Breast abscesses are most common in young lactating women. [9] The incidence of abscesses in young women during their lactational period ranges from 0.4 to 11%. [10] Most researchers have reported Staphylococcus aureus as among the common cause of the infection. [11] For the treatment of breast abscesses, surgical incision and drainage usually carried out under general anaesthesia is the traditional method of treatment. [10]

Maximum number of cases i.e. 120 (60%) were observed in the 15-25 yrs of age group followed by patients more than 26-35 years (20%). These results corroborate with the past studies, which showed the mean age to be 22.3 years.[12] The disease essentially affects the women of child bearing age group. In the present study, pain was present in 100% of patients, 96% patients had swelling and 83% patients complained history of fever on presentation. Out of 92 cases operated by open method, 64% cases were lactating mothers, while 36% cases were non-lactating. Newton et al reported similar findings in their study. [13] They mentioned three factors of importance in the development of breast abscess including trauma, stasis and infection. The mean duration of lactation in the study was noted to be 23.93 days, which was similar with the study done by Dener et al. [14]

Abscess on right side was more common (64%) then on left side (36%). Maximum nnumber of patients 116 (58%) had breast abscess in the upper outer quadrant followed by 50 (25%) cases in the lower outer quadrant, 26 (13%) cases in the upper inner quadrant and 8 (4%) cases in the lower inner quadrant. It was found that the most common organism found was coagulase positive Staphylococci in 142 (71%) patients. In the study in 48 (24%) cases no organism was grown in the culture i.e. it was a sterile culture. In 10 cases (5%) E. coli species was grown in the culture. The total number of dressings in the open category was 16.44, whereas in the closed category it was 3.38. This result was similar to study published by Rangabashyam from Chennai, who documented average healing time of 7 days in breast abscess. [15] This is because in closed group the healing occurred by primary intention which takes shorter time as compared to healing by secondary intention in the open group which takes a longer time. Among the total cases, total recurrence was seen in 20 (10%) cases from which 6 (6%) cases in open group and in 14 (14%) cases in closed group. Macfic et al documented a recurrence rate of 11.4% with primary closure technique and 7.3% with open drainage. [16]

Conclusion

Dressing in conventional method is painful and causes discomfort to the patient. Primary closure technique has a major drawback of failure, but the failure rates are acceptable. The duration of hospital stay and nursing care was less in primary closure technique as compared to open method of treatment.

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