

**A Prospective Study to Compare Open and Closed Method of Drainage of Breast Abscess**Ashutosh Kumar Singh<sup>1</sup>, Lalan Kumar<sup>2</sup>, Rajesh Narayan<sup>3</sup><sup>1</sup>Assistant Professor, Department of Surgery, BMIMS, Pawapuri, Nalanda, India<sup>2</sup>Assistant Professor, Department of Surgery, BMIMS, Pawapuri, Nalanda, India<sup>3</sup>Professor, Department of Surgery, BMIMS, Pawapuri, Nalanda, India

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Conflict of interest: Nil

**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 prospective study was designed to compare the breast abscess cases (both open and closed) admitted in Department of Surgery for the period of two years. Total 100 cases were selected for the study and divided into two groups, the open group and the closed group.**Results:** Maximum no. of cases i.e. 60 (60%) were observed in the 15-25 yrs of age group followed by patients more than 26-35 years (20%). In the present study, pain was present in 100% of patients, 48 (96%) patients had swelling and 83 (83%) patients complained history of fever on presentation. Out of 46 cases operated by open method, 30 (64%) cases were lactating mothers, while 18 (36%) cases were non-lactating. Abscess on right side was more common (64%) than on left side (36%). Maximum no. of patients 58 (58%) had breast abscess in the upper outer quadrant followed by 25 (25%) cases in the lower outer quadrant, 13 (13%) cases in the upper inner quadrant, and 4 (4%) case in the lower inner quadrant. It was found that the most common organism found was coagulase positive Staphylococci, in 71 (71%) patients. In the study in 24 (24%) cases no organism was grown in the culture i.e. it was a sterile culture. In 5 cases (5%) E. coli species was grown in culture. The total number of dressings in the open category was 15.45, whereas in the closed category it was 3.32. Among the total cases, total recurrence was seen in 10 (10%) cases from which 3 (6%) cases in open group and in 7 (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

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**Introduction**

A breast abscess is a localized collection of pus in the breast; usually occur in breastfeeding woman due to trauma and mastitis. [1] Breast abscesses are most common in young lactating women. [2] The incidence of abscesses in young women during their lactational period ranges from 0.4 to 11%. [3] Mostly researchers reported Staphylococcus aureus is among the common cause for the infection. [4] Typically, there is a painful erythematous mass formation in the breast with occasional draining through the overlying skin of nipple areolar 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. [5]

Breast abscess is most dreaded complication of mastitis more common in lactating mothers. The etiology behind mastitis to convert into breast abscess occurs in the setting of the breastfeeding problems which typically result in prolonged engorgement or poor drainage. [6] Early diagnosis and prompt proper treatment of mastitis is the key to avoiding complications. [7] Wide range of treatment of the breast abscess from conservative management to surgical intervention, traditionally surgical incision and drainage are the treatment of choice in breast abscess. [8] The treatment of breast abscesses poses a difficult clinical problem. [9] Traditional method of the management of breast abscess involves incision and drainage was associated with need for general anesthesia, prolonged healing time,

regular dressing, difficulty in breastfeeding, and possible unsatisfactory cosmetic outcome. [10]

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. [11] 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 any loculi and draining the pus material from the cavity by incision of the swelling is the most common method which follows the irrigation of cavity and either left open and packed with gauze or approximated around a drain. [12] 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 physician.

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.

#### Materials and Methods

A cross sectional prospective study was designed to compare the breast abscess cases (both open and closed) admitted in Department of Surgery, BMIMS, Pawapuri, Nalanda, India for the period of two years. All the studied cases were subjected to clinical assessment using signs, symptoms and laboratory criteria, which were recorded in the proforma. Total 100 cases were selected for the study and divided into two groups, the open group and the closed group. Out of which 50 were allocated in the open group which were treated by incision, drainage and packing and the remaining 50 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 condition like Diabetes Mellitus, H.I.V., Hepatitis B, etc.

Detailed history was taken regarding complaints, duration, severity, onset of symptoms, mode of onset, progression of symptoms, change in pattern at time of presentation. Enquiries were made about history of diabetes and immuno-compromised state was done. 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 done regarding built, nutritional status, hydration, general appearance and presence of systemic illness. Vitals signs were recorded in each case. Systemic examination done to rule out any systemic disease.

Through 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 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 is made over the most prominent and most dependent part of the abscess cavity. A pair of artery forceps or sinus forceps is forced into the abscess cavity, the blades are gradually opened and pus is extruded out. Pus is collected using a sterile swab or a syringe for isolating the type of microorganisms for culture and sensitivity. Finger is now introduced into the abscess cavity to break the loculations, for free drainage of pus. Drain all the accessible purulence using external pressure, suction or irrigation. Using a curette, the wall of the cavity is 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. [13]

Now two different methods of packing were applied. Packing of the abscess cavity in open method, is a common method and sterile tapes, gauze or sponges were used in this method to pack the full extent 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. Closed method, an alternative method to the packing of abscess cavity, where one can obliterate the abscess cavity by placing a negative suction drain no.16 (Romovac) inside the cavity and closing 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 be done twice a day, once daily or on alternate days depending on the soakage of the dressing and condition of the wound. Inj. Amoxicillin and clavulanic acid 1.2 gms Intravenous were given, two times a day for three days.

In open group dressings were done till complete healing or epithelisation occurred or till secondary

suturing is done. The frequency of dressing was decided upon soakage from the wound. Patients were allowed to breast feed their child from affected breast after complete healing of abscess and were asked for review on O.P.D. basis weekly; up to 6 weeks. In closed group dressing were done once in 2 or 3 days till the healing occurred. The drain removal was done when drain 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 postoperative 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	31	62	29	58	60	60
26-35	6	12	14	28	20	20
36-45	1	2	7	12	8	8
45+	12	24	0	0	12	12
Total	50	100	50	100	100	100

Maximum no. of cases i.e. 60 (60%) were observed in the 15-25 yrs of age group followed by patients more than 26-35 years (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	%
<b>Symptoms</b>						
Pain	50	100	50	100	50	100
Swelling	48	96	50	100	98	98
Fever	41	82	42	84	83	83
<b>Lactational history</b>						
Present	32	64	47	94	79	79
Absent	18	36	3	6	21	21
<b>Side of breast abscess</b>						
Right	30	60	34	68	64	64
Left	20	40	16	32	36	36
<b>Quadrant involved</b>						
Upper Outer	28	56	30	60	58	58
Lower outer	12	24	13	26	25	25
Upper inner	9	18	4	8	13	13
Lower inner	1	2	3	6	4	4

In the present study, pain was present in 100% of patients, 48 (96%) patients had swelling and 83 (83%) patients complained history of fever on presentation. Out of 46 cases operated by open method, 30 (64%) cases were lactating mothers, while 18 (36%) cases were non-lactating. Abscess

on right side was more common (64%) then on left side (36%). Maximum no. of patients 58 (58%) had breast abscess in the upper outer quadrant followed by 25 (25%) cases in the lower outer quadrant, 13 (13%) cases in the upper inner quadrant, and 4 (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	35	70	36	72	71	71
No Growth	13	26	11	22	24	24
<i>E. coli</i>	2	4	3	6	5	5

It was found that the most common organism found was coagulase positive Staphylococci, in 71 (71%) patients. In the study in 24 (24%) cases no organism was grown in the culture i.e. it was a sterile culture. In 5 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	15.45	<0.05
Closed	3.32	
Group	Mean number of days	
Open	12.08	<0.05
Closed	7.6	

The total number of dressings in the open category was 15.45, whereas in the closed category it was 3.32.

**Table 5: Recurrence of breast abscess**

	Open		Closed		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Recurrence	3	6	7	14	10	10
No recurrence	47	94	43	86	90	90
Total	50	100	50	100	100	100

Among the total cases, total recurrence was seen in 10 (10%) cases from which 3 (6%) cases in open group and in 7 (14%) cases in closed group.

#### Discussion

A breast abscess is a localized collection of pus in the breast; usually occur in breastfeeding woman due to trauma and mastitis. [14] Breast abscesses are most common in young lactating women. [15] The incidence of abscesses in young women during their lactational period ranges from 0.4 to 11%. [16] Mostly researchers reported Staphylococcus aureus is among the common cause for the infection. [17] For the treatment of breast abscesses, surgical incision and drainage are usually carried out under a general anaesthesia, is a traditional method of treatment. [16] Breaking down any loculi and draining the pus material from the cavity by incision of the swelling is the most common method which follows the irrigation of cavity and either left open and packed with gauze or approximated around a drain. [12]

Maximum no. of cases i.e. 60 (60%) were observed in the 15-25 yrs of age group followed by patients more than 26-35 years (20%). These results corroborates with the past studies, which showed the mean age to be 22.3 years. [18] The disease essentially affects the women of child bearing age group. In the present study, pain was present in 100% of patients, 48 (96%) patients had swelling and 83 (83%) patients complained history of fever on presentation. Out of 46 cases operated by open method, 30 (64%) cases were lactating mothers, while 18 (36%) cases were non-lactating. Newton et al reported similar findings in their study. [19] They mention 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. [20]

Abscess on right side was more common (64%) than on left side (36%). Maximum no. of patients 58 (58%) had breast abscess in the upper outer quadrant followed by 25 (25%) cases in the lower outer quadrant, 13 (13%) cases in the upper inner quadrant, and 4 (4%) case in the lower inner quadrant. It was found that the most common organism found was coagulase positive Staphylococci, in 71 (71%) patients. In the study in 24 (24%) cases no organism was grown in the culture i.e. it was a sterile culture. In 5 cases (5%) E. coli species was grown in culture. The total number of dressings in the open category was 15.45, whereas in the closed category it was 3.32. This result was similar to study published by Rangabashyam from Chennai, who documented average healing time of 7 days in breast abscess. [21] 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 10 (10%) cases from which 3 (6%) cases in open group and in 7 (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. [22]

#### 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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