

# A Prospective Comparative Study of Needle Aspiration vs Incision and Drainage of Lactational Breast Abscess

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## ABSTRACT

**Introduction:** Puerperal breast abscess is a common problem in lactating mothers causing significant morbidity with the incidence ranging from 0.4 to 11% in Indian subcontinent. Study aimed to compare the outcomes of needle aspiration vs incisional drainage of lactational breast abscess with reference to recurrent abscess, time required for complete healing, pain and scar, to study the most common organism in the breast abscess and to study the sensitivity of the organisms seen in breast abscess.

**Material and methods:** This is a prospective study done from 1st April 2017 to 1st March 2018. All patients who come to outpatient department of RVM Medical College with the diagnosis of lactational breast abscess were taken as study population. Data of 60 patients with clinical features suggestive of puerperal breast abscess was recorded. The patients were then divided into two treatment groups A and B with 30 patients in each group. Patients in group A underwent percutaneous needle aspiration and in group B underwent open surgical drainage.

**Results:** A total of 60 breast abscesses were treated by these methods. In group A 25 patients were treated successfully with needle aspiration and antibiotics. The mean time for healing is 11 days in 2 cm abscess and longest 23.5 days in 5 cm abscess. 7 abscesses showed growth of S.aureus, 17 showed MRSA, 4 showed no growth, 2 abscesses showed other rarer organisms. Success rate of aspiration is 83%. This is an outpatient procedure and is cost effective. Patient satisfaction is more in aspiration group. Group B patients underwent incision and drainage but it is associated with cessation of breast feeding, cumbersome scar, and prolonged healing times. Mean time of healing in 3 cm abscess is 25.5days and 5cm abscess is 30 days.

**Conclusion:** We conclude that needle aspiration in the management of uniloculated puerperal breast abscess is an effective method of treatment.

**Keywords:** Puerperium, Lactational Breast Abscess, Needle Aspiration, Incision Drainage

## INTRODUCTION

Puerperal or lactational breast abscess is a common problem in lactating mothers causing significant morbidity. The incidence of breast abscesses in lactational mastitis ranges from 0.4 to 11% in Indian subcontinent<sup>1</sup>. Risk factors for lactational breast abscess are primipara, gestational age >40 weeks and history of mastitis. A stage of mastitis precedes abscess formation. Sonography became an important diagnostic modality in the diagnosis of breast abscess which differentiates between mastitis and abscess<sup>2</sup>.

Non puerperal breast abscess occurs outside the breast

feeding period. They are seen in obese, tobacco smokers<sup>3</sup>. Other types of breast abscesses include tubercular breast abscess, granulomatous mastitis, fungal mastitis.

The traditional management of breast abscess was incision and drainage, but significant morbidity was associated with the procedure. Moreover this is an inpatient procedure and patients are exposed to the risks of general anaesthesia. 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<sup>4</sup>.

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<sup>5-8</sup>.

Our hospital registers approximately 100 -120 patients with a diagnosis of breast abscess every year, out of which 60-70 are lactational breast abscesses. The purpose of our study is to find out the efficacy of needle aspiration in the management of lactational breast abscess.

Study aimed to compare the outcomes of needle aspiration vs incisional drainage of lactational breast abscess with reference to

- Recurrent abscess
- Time required for complete healing
- Pain
- Scar

And to study the most common organism in the breast abscess and to study the sensitivity of the organisms seen in breast abscess.

## MATERIAL AND METHODS

This is a prospective study done from 1st April 2017 to 1st March 2018. All patients who come to outpatient department of RVM Medical College with the primary diagnosis of

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lactational breast abscess were taken as study population.

Data of 60 patients with clinical features suggestive of puerperal breast abscess (fever, pain, swelling, redness of breast associated with localized tenderness) and who gave consent was recorded. The diagnosis was confirmed by ultrasound evidence of liquefaction with long axis diameter for consideration of size. The patients were then divided into two treatment groups A and B with 30 patients in each group. Patients with co-morbid conditions were excluded from the study.

Patients with group A, underwent percutaneous needle aspiration as an outpatient basis using 18 gauge needle attached with 20 cc syringe. All the patients were encouraged for breast feeding. Further aspirations if needed were done at an interval of 5-7 days till the resolution of signs and symptoms. There are two end points in the management, when no further pus is aspirated and confirmation of absence of residual abscess by ultrasound done after 2-3 days after 1<sup>st</sup> endpoint. Failure of treatment in group was declared on the basis of persistence of symptoms and signs after 5 aspirations. Amoxicillin + Clavulanic acid was given to all the patients till culture sensitivity report. Antibiotic is stepped up if the culture shows resistance to amoxicillin clavulanate. A total of 7 days of antibiotics were given to all patients. Patients are encouraged for breast feeding from both the sides.

Patients with group B underwent open surgical drainage under general anaesthesia as an inpatient basis. Injection Amoxicillin + clavulanic acid was given to the patient on the day of surgery and shifted to oral medication on discharge. All the patients stayed for 1 day in the hospital. Daily dressing with packing gauze was done till the resolution of sign and symptoms and complete healing of wound as end point of management. Antibiotic was given for 7 days to all the patients. All patients were encouraged for breast feeding from opposite side with expression of milk on the same side. Pain is a subjective phenomenon. There are no biochemical parameters for measurement of pain. Pain is measured by Visual pain analog scale<sup>5</sup>. But we selected a different method of measuring the pain. The number of analgesics required by the patient during the course of the treatment was taken into account.

#### Inclusion criteria

- 1) Abscesses of size < 5cm
- 2) All lactational breast abscess

#### Exclusion criteria

- 1) Tubercular abscess
- 2) Chronic Granulomatous mastitis
- 3) Galactocele
- 4) Fungal infection
- 5) Non Lactational breast abscess

#### Sample size: 60

Group A: 30

Group B: 30

Using G power software the sample size of 60 was obtained which is sufficient to obtain 80% power of study.

## DATA ANALYSIS

Statistical analysis of the data was carried out with the help of SPSS (version 20) for Windows package (SPSS Science, Chicago, IL, USA). Student's t-test was used to test statistical significance of difference in means of duration of hospital stay or in mean time required for complete healing between two independent groups. Z test for proportions (or Fisher's exact test in case of small frequencies in cell) was used to examine the significance of proportion of patients with postoperative pain or residual abscess between the two groups. p value < 0.05 was considered significant.

## RESULTS

In our study maximum number of patients were in greater

Age in years	21-25	26-30	>30
Group A	6	13	11
Group B	3	10	17
Total	9(15%)	23(38.3%)	28(46.6%)

**Table-1:** Comparison of age between the two groups

	2cm	3cm	4cm	5cm
Group A	1	10	10	9
Group B	0	1	5	24
Total	1(3.3%)	11(18.3%)	15(25%)	33(55%)

**Table-2:** Comparison of size of abscess between the two groups

	Right	Left
Group A	14	16
Group B	14	16
Total	28(46.7%)	32(53.3%)

**Table-3:** Comparison of the site of abscess between the two groups

	UIQ	UOQ	LIQ	LOQ
Group A	6	8	8	8
Group B	4	6	8	12
Total	10(16.7%)	14(23.3%)	16(26.7%)	20(33.3%)

UIQ – Upper Inner Quadrant; UOQ – Upper Outer Quadrant; LIQ – Lower Inner Quadrant; LOQ – Lower Outer Quadrant

**Table-4:** Comparison of the quadrant of abscess between the two groups

	Primi	Multigravida
Group A	18	12
Group B	14	16
Total	32(53.3%)	28(46.7%)

**Table-5:** Comparison of parity between the two groups

	FTND	LSCS
Group A	13	17
Group B	9	21
Total	22(36.7%)	38(63.3%)

FTND – Full Term Normal Delivery; LSCS – Lower Segment Caesarean Section

**Table-6:** Comparison of mode of delivery between the two groups

	<6weeks	7-10weeks	>10 weeks
Group A	24	4	2
Group B	27	2	1
Total	51(85%)	6(10%)	3(5%)

**Table-7:** Comparison of onset of symptoms between the two groups

	S.aureus	MRSA	Sterile	Other
Aspiration	7(23.3%)	17(56.7%)	4(13.3%)	2(6.7%)
I and D	8(26.7%)	21(70%)	0	1(3.3%)
Total	15(25%)	38(63.3%)	4(6.7%)	3(5%)

**Table-8:** Comparison of organism isolated between the two groups

	Aspiration (days)	I and D (days)
2cm	11	-
3cm	16.62	25.5
4cm	18.5	29
5cm	23.7	30.36

**Table-9:** comparison of time required for healing between the two groups

Residual abscess		Total	p value
Yes	No		
Group A	5	30	0.038
Group B	0	30	

**Table-10:** Comparison of residual abscess between the two groups

than 30 years and the smallest abscess was of size 2 cm and the largest was 5cm (table-2).

In our study there were 28 right sided and 32 left sided abscesses (table-3).

Our study reported a total of 36 abscesses in the lower quadrant. Even if the abscess was located in more than one quadrant, we had considered that quadrant of the abscess which had the maximum diameter (table-4).

In the study 53.3% of the patients were primipara and 46.7% were multipara (table-5).

Maximum number of patients (38) had Lower Segment Caesarean Section (table-6). In our study more number of patients were presented within the first 6 weeks (85%) (table-7).

In our study we had noticed 63.3% of the abscesses grow Methicillin resistant Staphylococcus aureus(MRSA). This is followed by Staphylococcus aureus (25%). Other organisms identified in the culture are Corynebacterium diphtheria, S.agalactea and S.epidermidis (table-8).

The mean duration of healing in group A and group B was 19.200 days and 30.1667 days respectively. Single aspiration was required in 7 patients, 2 aspirations were required in 13 patients, 3 aspirations were required in 3 patients, 4 aspirations were required in 1 patient and 5 aspirations were required in 1 patient (table-9).

Out of 30 patients in group A only 25 were successfully treated by aspiration. In group B all the 30 patients were treated by incision and drainage. The failure rate of aspiration

was 17% (table-10).

### Pain

During the course of treatment all the patients in both the groups received combiflam (Paracetamol + Ibuprofen) as analgesic agent. Abscess was a painful condition and all the patients of Group A were relieved of pain after aspiration but pain persisted with subsequent collection of pus during the next follow up. All the patients had taken combiflam during the day of aspiration thrice daily and thereafter whenever necessary. In Group B, patients were relieved of pain immediately after incision and drainage. But the pain was intolerable during the dressings and all the patients had taken the NSAID for a minimum of 5 days thrice daily.

### Scar

In our study, group A patients all the patients who were successfully treated by aspiration(25) had no scar, those who underwent incision and drainage (5) had scar. In group B all the patients had scar.

### Sensitivity of drugs

In our study all the patients received 7 days of antibiotic course. All the patients in both group A and group B were started on Amoxicillin and Clavulanic acid till the culture sensitivity report. In the patients whose abscess had shown the growth of S.aureus, Amoxicillin + Clavulanic acid was prescribed and in patients whose abscess showed the growth of MRSA, Linezolid was given for 7days. Staphylococcus aureus, S.agalactea, S.epidermidis showed sensitivity to Amoxicillin and Clavulanic acid. Corynebacterium showed sensitivity to macrolide group of drugs. Amoxicillin + Clavulanic acid was given for 7 days followed by Erythromycin for 7 more days.

## DISCUSSION

### Age

In our study the youngest patient was 23 years and the oldest was 38 years old. The mean age of all the patients in the study was 30 years. The mean age was different in different studies<sup>6-10</sup>. Ulitzsch et al<sup>8</sup> from Sweden and AF Christensen et al<sup>9</sup> from Denmark had reported 32 years of mean age in their study. This implies the age of pregnancy in the European countries is above 25 years. In Gojen Singh et al he considered non lactating patients which was the reason for the mean age of 32 years in his study<sup>10</sup>.

### Size of abscess

In our study the smallest abscess was of size 2cm and the largest was 5cm. Based on success rate with respect to size of abscess in multiple studies around the world we had decided the cut off point for maximum size to be 5cm<sup>10-13</sup>.

### Site of abscess

Our study reported a total of 36 abscesses in the lower quadrant. Studies of Singh et al<sup>10</sup> and Chandika et al<sup>14</sup> reported most of the breast abscesses in the upper outer quadrant. The reason for the observation in our study might be because the milk from the lower quadrant of the breast would have to move against the gravity and has more chance of stasis of the milk in the ducts of lower quadrant. Mastitis

and abscesses occurs when there is milk stasis. Secondly the sample size is too small to reach a conclusion, so it might be just an observation in our study which requires further evaluation.

#### Parity and mode of delivery

In our study 53.3% of the patients were primipara (Table 5). This observation of our study very well corroborates with the data of different studies<sup>8,14</sup>. Kamal Kataria<sup>15</sup> et al from said that the risk factors for the formation of breast abscess were first pregnancy, mastitis, pregnancy more than 41 weeks. The reason was in primipara because of the lack of experience regarding the positioning of the baby, nipple areola care and poor hygiene predisposes for the formation of breast abscesses. This was collaborated from the data around the world.

63.3% of the patients in my study underwent caesarean section as against 37% of normal vaginal delivery (Table 6). High percentage of breast abscesses in their group can be explained by the fact that operative procedure with anaesthesia, post operative analgesia and drowsiness, difficulty in sitting up to breast feed, delay in initiation of breastfeeding. No study had reported any relation between the mode of delivery with the development of breast abscesses.

#### onset of symptoms from initiation of breast feeding

In our study more number of patients were presented within the first 6 weeks (85%). Kamal Kataria et al<sup>15</sup> said that most of the lactational abscesses occurs during 2 periods within first 4 weeks of breast feeding due to inexperience and secondly after 6 months due to trauma to the nipple by the teeth of the infant. Dieter Ulitzsch et al<sup>8</sup> reported a mean time of 5.4 weeks for the development of abscess after delivery.

#### Organisms identified

In our study we noticed 63.3% of the abscesses grow Methicillin resistant Staphylococcus aureus (MRSA). This is followed by Staphylococcus aureus (25%). All the previous studies reported that Staphylococcus aureus was the most common organism found in the cultures of breast abscess. Many other studies also confirmed that the most common organism obtained in culture was S. aureus<sup>16-18</sup>.

#### Residual abscess

Kaushal S et al<sup>12</sup> in their study found 3 patients with recurrence of the abscess.

Chandika et al<sup>14</sup> in their study noticed no recurrence in the patients treated with aspiration but he noticed recurrences in incision and drainage group.

Sarhan HH in their study said the importance of ultrasound in the follow up to see for residual abscess in the absence of clinically evident abscess<sup>20</sup>.

Elagili et al<sup>17</sup> concluded multiloculated abscess associated with approximately 50% failure to cure by aspiration. Hook<sup>21</sup> et al in his study concluded that abscess of size > 3cm is difficult to treat by aspiration. Kaushal S et al<sup>12</sup> and many others<sup>7</sup> noticed a failure rate of 17%. Smaller size of the abscess can be treated by aspiration and larger sized abscesses needed incision and drainage<sup>18</sup>.

#### Scar

Imperiale et al<sup>22</sup> in their study said the cosmetic result was optimal in all cases. Kaushal S et al<sup>12</sup> said that all the patients who underwent incision and drainage complained of an ugly scar. Dieter Ulitzsch et al<sup>8</sup> and Singh et al<sup>10</sup> in their study reported 96% of patients treated by aspiration were satisfied by the cosmetic results.

According to Chandika et al<sup>14</sup> needle aspiration was a highly accepted modality. The high acceptance rate may be because of the convenience of the procedure which was an outpatient procedure and had no wound to nurse on and absence of scar.

#### Success rate

The success rate of needle aspiration in our study is 83%. This correlated with the success rate of certain studies. JM Dixon<sup>6</sup> and Tewari M<sup>23</sup> noticed a 100% success rate in their study. Many studies reported a success rate of 80 – 90%<sup>7,12,17,19</sup>.

#### CONCLUSION

We conclude that percutaneous needle aspiration is an effective method of treatment for uniloculated small breast abscesses. Incision and drainage should be considered when aspiration fails or when the size of the abscess is large.

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