# A Comparative Study of Conventional Incision and Drainage with Minimally Invasive Drainage of Breast Abscess in Government Medical College, Alappuzha

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**ABSTRACT**

**BACKGROUND**

It has been recently reported that breast abscess can be managed more efficiently with USG guided aspiration as well as incision and closed suction drainage (minimally invasive drainage of breast abscess) with equivalent results when compared to the conventional I & D. we wanted to compare the conventional mode of incision & drainage of breast abscess with the minimally invasive drainage of breast abscess in terms of post op pain, duration of hospital stay, resolution time, cosmetic appearance.

**METHODS**

This is an observational study conducted among 50 breast abscess cases, in the age group of 18 – 40 years, admitted under General Surgery Department of Govt. Medical College, Alappuzha, between January 2017 - January 2018. 50 patients included in the study were divided into two groups - group A - conventional I & D of their breast abscess, and group B - getting minimally invasive drainage of their breast abscess. Analysis was done using the SPSS software.

**RESULTS**

In terms of post-op pain, duration of hospital stay, resolution time & cosmetic appearance the results were statistically significant and it was found that the minimally invasive breast abscess drainage was better than the conventional I & D.

**CONCLUSIONS**

Primary closure and placement of suction drain (minimally invasive drainage of breast abscess) is a better method of breast abscess drainage when compared with the Conventional I & D.

**KEYWORDS**

Incision & Drainage (I & D), Minimally Invasive Drainage of Breast Abscess, Visual Analogue Scale (VAS), Patient and Observer Scar Assessment Scale (POSAS), Primary Closure & Suction Drainage, Residual Abscess, Pus C & S

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## BACKGROUND

The breast is composed of parenchyma & stroma, originating from the ectodermal and mesodermal elements respectively.[1] Breast infections are common. An initial stage of cellulitis or mastitis followed by progression to breast abscess. Breast abscess occurs more commonly during the lactation.[2,3] Abscess is diagnosed when there is a painful lump which is fluctuant and skin erythematous.The conventional treatment of breast abscess has been incision & drainage.[4] It has been recently reported that breast abscess can be managed more efficiently with USG guided drainage as well as incision and closed suction drainage.[5] The major advantages of these new procedures are lesser pain, lesser duration of hospital stay, shorter time of healing and better cosmesis. The present study intends to compare the conventional incision and drainage with the alternate method of minimally invasive incision and closed suction drainage with regards to postop pain, duration of hospital stay, time for healing and scar quality.

## METHODS

This is an observational study conducted over a period of 1 year extending from January 2017 to January 2018. Cases of breast abscess admitted in the Department of Surgery T.D.M.C. Alappuzha, within the age group of 18 - 40 years were included in the study. Data was collected after obtaining informed written consent from the patients. Permission to conduct the study was obtained from Human Ethical committee of Government T.D.M.C.
Alappuzha, Kerala on 15 / 12 / 2016.

### Sample Size Calculation

The researcher has included all patients admitted with breast abscess in surgery department during the period of study, 50 patients could be followed up during the period of study.

### Inclusion Criteria

- Clinically diagnosed cases of breast abscess within age group of 18 - 40 years.
- Abscess with positive fluctuation test.
- Abscess cases to undergo surgical intervention either conventional incision and drainage or minimally invasive incision and catheter drainage.
- Abscess more than 3 cm in size

### Exclusion Criteria

- Abscess which are about to burst with skin changes.
- Patients not willing for surgical interventions.

### Study Variables

- Type of breast abscess.
- Size of breast abscess.
- Age.
- Sex.

### Data Collection Tools

- Routine blood investigations- CBC, RFT, RBS
- Clinical examination
- USG breast
- Pus C & S (culture and sensitivity) reports

Patients were divided into 2 groups:

Group A - Undergoing conventional incision & drainage done in S 2, 3, 4, 5 surgery units.

Group B - Undergoing minimally invasive drainage (with suction catheter) under S1 unit.

Patients were then followed up for a time period of 30 days. The two groups of patients were assessed in terms of post op pain, duration of hospital stay, resolution time and cosmetic appearance.

### Procedure

Patients diagnosed as breast abscess both clinically and sonologically were undergoing treatment under S1 unit with minimally invasive incision and suction drainage (Group B), while all other units S2, S3, S4, S5 units followed the conventional incision and drainage of breast abscess (Group A). The following were done before procedure -

- Arrange blood products – 1 unit PRC.
- Blood Grouping.
- CBC.
- RBS.
- CXR-PA.
- ECG.
- USG Breast.
- HIV, HBsAg, Anti–HCV.
- Inj. Ceftriaxone 1 g IV 1 hour before incision.
- Inj. TT 0.5 mg IM stat.
- Prepare parts for surgery.

### Minimal Incision & Suction Drainage

Patient admitted under surgical unit S1 underwent this procedure. Pre-op diagnosis and side affected were cross checked before procedure. iv antibiotics were continued, the patient was positioned, cleaning and draping was done. Administered 2 ml of midazolam. Lignocaine with adrenaline and one ampule sodium bicarbonate was mixed and 15 ml was used as local anaesthetic. Incision was placed over the superior aspect of the swelling near the areola and a curved artery forceps passed through the 2cm incision and all loculi were broken down, a drain was inserted through the incision and brought out through a separate stab incision at 180 degrees to first incision. Haemostasis was attained and drain was fixed with 2 - 0 silk. Suction drain was kept. Postop followed up in surgical ward with daily dressings and iv antibiotics were continued. Drain was removed when it was less than 10 ml per 24 hours.

**Breast Abscess Drainage by Conventional I & D**

After confirmation of diagnosis and marking the side affected, patient was positioned, cleaning and draping was done. Local anaesthesia and IV sedation in the form of lignocaine and midazolam were given. Incision was put over the most dependent area of the breast. Artery forceps used to break loculi. Thorough wash given. Wound packed with betadine gauze. Post op follow up was done with daily C & D (cleaning and draping) and IV antibiotics. Wound was left to heal by secondary intention.

**Follow Up**

Both groups of patients were followed up. Cosmetic appearance was analysed using the Patient and Observer Scar Assessment scale (1 - 10) on post op days. Post op pain was analysed using the Visual Analogue Scale (0 - 10) on post op days. Residual abscesses were diagnosed in cases with clinical suspicion with follow up USG.

**Data Analysis**

The data collected is analyzed using SPSS data analysis tool. Comparison will be mostly about the post op pain, duration of hospital stay, resolution time of breast abscess, cosmetic appearance using the scar assessment scale. Epi Info 7 and Microsoft Excel version 10 will be used for data entry and data consolidation. Analysis will be carried out with SPSS version 16 and Microsoft Excel version 10. All graphs, tables and charts will be made using Microsoft Excel version 10.

The data will be categorized into two groups

Categorical / Qualitative data: Gender, mode of treatment etc.

Continuous / Quantitative data: Age, visual analogue score, patient and observer scar assessment scale, pulse rate, blood pressure etc.

Pearson's chi-square test and Fishers exact test will be used for qualitative data. For continuous data the correlation coefficient, unpaired test will be used to establish significance and measure degree of association. Healing rates will be calculated with their 95 % confidence intervals.

## RESULTS

The mean duration of hospital stay in Group A is 12.9 Days and the mean duration of hospital stay in Group B is 9 days.

| Group | Mean | SD | N | t | P |
|---|---|---|---|---|---|
| A | 12.9 | 2.0 | 25 | 7.85 | < 0.01 |
| B | 9.0 | 1.6 | 25 | 7.85 | < 0.01 |

***Table 1. Comparison of Duration of Hospital Stay in the Two Groups***

**In Group A**

The mean pain score on post op day 1, 3 & 7 were, 8, 6. 8 & 4.5 respectively. The median pain score on post op day 1, 3 & 7 were 8, 7 & 5 respectively.

**In Group B**

The mean pain score on post op day 1, 3 & 7 were 4.1, 3. 2 & 2 respectively. The median pain score on post op day 1, 3 & 7 were 4, 3 & 2 respectively.

| VAS | Group A | Group B | Z# | P |
|---|---|---|---|---|
| Day 1 | 8 ± 0.9 8.0 7 - 9 | 4.1 ± 1 4.0 3 - 5 | 6.14 | < 0.01 |
| Day 3 | 6 ± 0.8 7.0 6 - 7 | 3.2 ± 1.5 3.0 2 - 4 | 5.54 | < 0.01 |
| Day 7 | 4.5 ± 0.8 5.0 4 - 5 | 2 ± 1 2.0 1 – 3 | 5.7 | < 0.01 |

***Table 2. Comparison of Pain at Different Intervals of Time Using the Visual Analogue Scale (1 - 10)***

# Mann-Whitney U Test

**In Group A**

The mean scar scale on post op day 7 were 8.4 for patient and 7.9 for observer. The median scar scale on post op day 7 were 8 for patient and 8 for observer.

**In Group B**

The mean scar scale on post op day 7 were 3.3 for patient and 2.9 for observer. The median scar scale on post op day 7 were 3 for patient and 3 for observer.

| POSAS | Group A | Group B | Z# | P |
|---|---|---|---|---|
| Patient | 8.4 ± 0.6 8.0 8 – 9 | 3.3 ± 0.5 3.0 3 - 4 | 6.3 | < 0.01 |
| Observer | 7.9 ± 0.7 8.0 7 – 8 | 2.9 ± 0.9 3.0 2 – 3 | 6.2 | < 0.01 |

***Table 3. Comparison of Cosmetic Appearance on Day 7 Using the Patient and Observer Scar Assessment Scale (POSAS)***

# Mann-Whitney U Test

**In Group A**

The mean scar scale for post op day 14 were 8.1 for patient and 7.9 for observer. The median scar scale for post op day 14 were 8 for patient and 8 for observer.

**In Group A**

The mean scar scale for post op day 14 were 2.4 for patient and 2 for observer. The median scar scale for post op day 14 were 2 for patient and 2 for observer.

| POSAS | Group A | Group B | Z# | P |
|---|---|---|---|---|
| Patient | 8.1 ± 0.9 8.0 8 – 9 | 2.4 ± 0.5 2.0 2 –3 | 6.23 | < 0.01 |
| Observer | 7.9 ± 0.8 8.0 7 – 8.5 | 2.0 ± 0 2.0 2 – 3 | 6.54 | < 0.01 |

***Table 4. Comparison of POSAS on Day 14 Using the POSAS***

# Mann-Whitney U Test

**In Group A**

The mean scar scale for post op day 30 were 7.5 for patient and 7.6 for observer. The median scar scale for post op day 30 were 7 for patient and 7 for observer.

**In Group A**

The mean scar scale for post op day 30 were 1.7 for patient and 1.8 for observer. The median scar scale for post op day 30 were 2 for patient and 1 for observer.

| POSAS | Group A | Group B | Z# | P |
|---|---|---|---|---|
| Patient | 7.5 ± 0.9 7.0 7 - 8 | 1.7 ± 0.5 2.0 1 – 2 | 6.23 | < 0.01 |
| Observer | 7.6 ± 0.8 7.0 7 – 8 | 1.8 ± 1.6 1.0 2 – 3 | 6.54 | < 0.01 |

***Table 5. Comparison of POSAS on Day 30 Using POSAS***

# Mann-Whitney U Test

### Comparison of Mean Duration of Healing

The mean duration of healing in Group A and Group B are 3.68 weeks and 2.68 weeks respectively. The standard deviation is 0.55678 for both groups (A & B). NB-Tabular description not included as part of publication. Difference - 1.000; SR - 0.157; 95 % CI - 1.3166 TO – 0.6834. T Statistics - 6.350; DF - 48. P < 0.0001.

## DISCUSSION

Statistics obtained from the study were compared with other related studies done before, the following observations were inferred.

### Comparison on Duration of Hospital Stay

In our study Group A 12.9 and Group B 9 days
Tewari et al.[6] 2006 – patients were sent on OPD basis.
Suthar et al.[7] 2012 – 35 days for I & D group.
Odiya et al.[8] 2016 – 50 days for I & D.

### Comparison of Pain Outcomes (VAS 1 - 10)

In our study Group A 8, 6.8, 4.5 and Group B 4.1, 3.2, 2 in POD 1, 3 and 7 respectively. Dieter Ulitzch et al.[9] VAS was 2 for incision and catherter drainage. Odiya et al.[8] VAS was 6.56 for I & D and 2.28 for incision and catheter drainage.

### Comparison of Cosmetic Outcomes (POSAS 1 - 10) Using Mann-Whitney U Test

In our study Group A showed p < 0.01 in the POD7, 14 and 30. Unfortunately no literature could be found for this parameter.

### Comparison of Resolution Time

In our study it was 3.68 and 2.68 weeks for Group A and Group B respectively
Tewari et al.[6] 2006 - not mentioned.
Anita et al.[10] 2014 - 3.14 + / - 0.60 for I & D and 2.16 + / - 0.37 for Aspiration of abscess.
Suthar et al.[7] 2012 – 3 for I & D.
Karvande et al.[11] 2016 – 1.04 for I & D and 0.61 for Aspiration of abscess.
Odiya et al[9] 2016 - 2.03 + / - 0.41 for I & D.

***Figure 1.***
***Upper Outer Quadarant Abscess***

***Figure 2.***
***I & D with Closed Suction Drainage***

***Figure 3.***
***Drain Removed Post Op Day 5***

***Figure 4.***
***Abscess with Skin Changes Pre-Op***

***Figure 5.***
***Drained Breast Abscess by Classical I & D Post Op Day 5***

## CONCLUSIONS

Minimally invasive breast abscess drainage was advantageous over the conventional I & D with regard to post op pain (p < 0.01), cosmetic appearance (p < 0.01), resolution time (p < 0.0001) and duration of hospital stay (p < 0.01). Other Advantages are that it maintains the benefits of I & D, no dead space, lactation continues, scar is better, minimal morbidity, cost-effective, cosmetic, cheap, any size of abscess can be drained and can be managed by community nurse.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.
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