



ULTRASOUND GUIDED NEEDLE ASPIRATION VERSUS SURGICAL DRAINAGE IN THE MANAGEMENT OF BREAST ABSCESES.

General Surgery

Dr. Vini Mehta PG resident, Department of General Surgery, MGMCH, Jaipur

Dr. Sweksha Sharma PG resident, Department of General Surgery, MGMCH, Jaipur

Dr. Nikhil Bansal Assistant Professor, Department of Interventional Radiology, MGMCH, Jaipur

Dr. Brijesh Kumar Sharma Professor, Department of General surgery, MGMCH, Jaipur

ABSTRACT

Introduction- Breast abscesses are a common problem, especially in lactating women of developing countries. Traditional treatment of breast abscess is by surgical incision and drainage. However, imaging guided percutaneous needle aspiration has become more popular as it is less invasive, gives good cosmetic results and can be managed entirely on outpatient basis. The reported breast abscess recurrence rate is between 10 and 38%. **Aims And Objectives-** This study was aimed to compare the traditional treatment Incision and Drainage against Ultrasound guided Needle aspiration in the treatment of breast abscess in terms of healing time at different variables and recurrence rate. **Materials And Methods-** A randomized controlled trial was conducted at Mahatma Gandhi medical college and hospital, Jaipur. A total of 50 patients were taken for the study, divided equally into two groups randomly, group A (ultrasound guided needle aspiration) or B (surgical incision and drainage). The patient's follow up was done in the OPD on day 7, day 14 and 30 days. Breast abscess recurrence and acceptance were assessed at the last visit (day 30). **Results -** The mean time taken for healing in Group A is 13.48 ± 9.575 days, ranging between 7 to 37 days. While in the Group B, the mean time taken for healing is 22.16 ± 13.075 days, ranging between 7 to 45 days. There was also significant difference noted in healing time of both groups at different variables. Only 1% patient who underwent ultrasound guided needle aspiration has recurrence of disease after 2 weeks as compared to 24 % of patients who underwent incision and drainage. **Conclusion-** Healing time of Breast Abscess was significantly less with Ultrasound Guided Aspiration in a young, lactating female having small sized and oval shaped abscess located mostly in periphery and intermediate breast tissue. Recurrence rate of breast abscess is much less after Ultrasound guided aspiration; therefore, it is an effective treatment option.

KEYWORDS

Breast abscess, Incision and drainage, Ultrasound, Needle aspiration, Healing time, Recurrence rate

INTRODUCTION:

Breast abscesses are a common problem, especially in lactating women (4,8). Although it is a very common cause of morbidity in women of developing countries, it is much less of concern in developed countries as a result of improved maternal hygiene, nutrition, standard of living and early administration of antibiotics (1,3). The breast abscess is highly common in pregnancy and mainly caused due to milk stasis leading to infection. (5)

Traditional treatment of breast abscess is by surgical incision and drainage (2,3). However, it may require general anesthesia, needs regular dressing, difficulty in breast-feeding and poor cosmesis. (2) Imaging guided percutaneous needle aspiration is a well-known alternative treatment and has become more popular as it is less invasive, gives good cosmetic result and can be managed entirely on outpatient basis (3). The reported breast abscess recurrence rate is between 10 and 38 % even after aggressive approach of incision and drainage combined with use of antibiotics. (1,7)

This study was aimed to compare the traditional treatment Incision and Drainage against Ultrasound guided Needle aspiration in the treatment of breast abscess in terms of healing time and recurrence at different variables. (3)

Aims And Objectives:

Aim:

To establish whether ultrasound guided needle aspiration is a feasible alternative and gold standard treatment for breast abscess in a tertiary health care centre.

Objectives:

To determine the difference in Mean healing time of two study arms i.e., Ultrasound guided Needle Aspiration and Surgical Drainage at different variables and to study the difference in recurrence rates of two treatment modalities.

MATERIALS AND METHODS:

A randomized controlled clinical trial was conducted from January 2021 to June 2022 at Mahatma Gandhi medical college and hospital, Jaipur. A total of 50 patients were taken for the study who presented in

General Surgery OPD fulfilling inclusion criteria.

Inclusion criteria:

1. A female patient aged 14 and above who presented to General Surgery OPD and Interventional radiology department with breast abscess.
2. Patient with written and informed consent.

Exclusion criteria:

1. Patients with recurrent or chronic breast abscess.
2. Those with necrotic skin overlying the abscess.
3. Immunosuppressed patients (diabetes, on steroids, with malignancies, autoimmune diseases, receiving immuno suppressants, on cancer drugs.)
4. Patients who do not give consent.
5. Patients with active COVID 19 infection.

Institute ethical committee approval was obtained before start of the study.

Methodology:

After recruitment, clinical diagnosis was made on the basis of presence of breast pain, $\pm$ fever and presence of a fluctuant tender breast swelling. The diagnosis was confirmed sonographically. In this study, healing was defined as achieving breast abscess resolution. Breast abscesses resolution is defined as clinically no breast tenderness, swelling or wound at the previous site of the abscess and sonographically complete absence of fluid collection, normal breast glandular and fibro fatty tissue with no oedema. After fulfilling the inclusion and exclusion criteria, informed consent was taken. Patients were randomized into two groups either group A (ultrasound guided needle aspiration) or B (surgical incision and drainage). There was no blinding.

Treatment procedure and follow up:

1. Incision and drainage

Patients were admitted and prepared for surgery. Under General anaesthesia, in supine position and aseptic condition, a skin depth incision is made at the area of maximum fluctuation along skin lines and a sinus forceps is used to reach the abscess cavity. Initial pus swab

was sent for Culture and sensitivity. The pus is then evacuated and loculi broken down digitally, the wound is packed with sterile gauze. Post operatively the patient is put on analgesics and antibiotics. The patient was discharged to undergo daily wound dressing. Antibiotics were changed according to culture and sensitivity report.

2. Ultrasound guided needle aspiration

Patients were managed on outpatient basis. Under aseptic condition, local anaesthesia was given. Aspiration is done under ultrasound guidance using a 11G to 18G needle, attached with 10 ml syringe. Aspiration is done until there is no significant residual pus. Initially aspirated pus will be sent for culture and sensitivity. After the procedure the patient will be discharged on antibiotics and analgesics and changed according to culture and sensitivity report.

The patient's follow up was done on day 7, day 14 and 30 days. At every follow up, clinical assessment of symptoms and signs along with ultrasound scan was done to assess resolution of the abscess. In situation where the abscess persisted in case of ultrasound guided needle aspiration, re-aspiration was done on day 7, if it still persisted on day 14 it will be considered treatment failure and hence converted to the traditional incision and drainage. Breast abscess recurrence and acceptance were assessed at the last visit (day 30). Patients who had not achieved complete resolution of the breast abscess at the end of the study period were referred to the outpatient clinic for further follow up.

Statistical analysis

Entire data was entered into a Microsoft office software and appropriate statistical test were applied and results calculated. Chi-Square test and t- test has been used to find the significance of study parameters. Suggestive significance (P-value: $0.05 < P < 0.10$)

OBSERVATION AND RESULTS:

Following are the results of comparative study between two treatment modalities of breast abscess. A total of 50 patients (each group having 25 patients) were studied prospectively.

Table 1: Mean Healing Time (in Days) Of Both The Groups

Groups	N	Mean	Std. Deviation	Std. Error Mean	P value
Group A (Ultrasound guided needle aspiration)	25	13.48	9.575	1.915	0.010 (S)
Group B (Incision and Drainage)	25	22.16	13.075	2.615	

S: Significant

The mean time taken for healing in Group A is 13.48 ± 9.575 days, ranging between 7 to 37 days. While in the Group B, the mean time taken for healing is 22.16 ± 13.075 days, ranging between 7 to 45 days. The Group A shown significantly less healing time than Group B. ($p < 0.05$; $p = 0.010$)

TABLE 2: MEAN HEALING TIME OF THE TWO STUDY ARMS AT DIFFERENT VARIABLES

Variables		Mean healing time in days Group A- USG guided aspiration	Mean healing time in days- Group B- Incision & drainage	Mean difference	95% CI	P value
Age	≤ 25 Years	14.93 SD- 10.087, n - 14	18 SD- 8, n - 4	3.070	-8.624 to 14.764	0.585
	> 25 Years	11.64 SD- 9.003, n - 11	22.95 SD- 13.836, n - 21	11.310	1.857 to 20.762	0.020
Symptoms	< 7 Days	9.45 SD- 3.425, n - 20	20.26 SD- 13.333, n - 15	10.810	4.510 to 17.109	0.001
	> 7 days	29.6 SD- 9.396, n - 5	25 SD- 12.823, n - 10	- 4.600	-18.650 to 9.450	0.491

Breastfeeding	Yes	13.75 SD- 8.291, n - 12	26.09 SD- 3.902, n - 11	12.340	2.517 to 22.162	0.016
	No	13.23 SD- 0.963, n - 13	19.07 SD- 11.983, n - 14	5.840	- 3.286 to 14.966	0.199
Parity	Primiparous	13.23 SD- 8.156, n - 13	20 SD- 0.703, n - 8	6.770	- 1.861 to 15.401	0.117
	Multiparous	11.63 SD- 9.003, n - 11	23.18 SD- 4.244, n - 17	11.550	1.614 to 21.485	0.024
	Nulliparous	37 SD- 0, n - 1	0 SD- 0, n - 0	INSIGNIFICANT		
Breast affected	Left	15.43 SD- 1.022, n - 14	20.69 SD- 3.609, n - 13	5.260	- 4.522 to 15.042	0.278
	Right	11 SD- 7.071, n - 11	23.75 SD- 2.870, n - 12	12.750	3.621 to 21.878	0.008
Quadrant affected	Upper outer	13 SD- 9.974, n - 5	12.25 SD- 3.5, n - 4	- 0.750	- 13.249 to 11.749	0.891
	Upper inner	9.8 SD- 3.834, n - 5	19.57 SD- 9.727, n - 7	9.770	- 0.556 to 20.096	0.061
	Lower outer	9.33 SD- 3.614, n - 6	21.83 SD- 5.302, n - 6	12.500	- 1.802 to 26.802	0.080
	Lower inner	9.8 SD- 3.834, n - 5	29.5 SD- 7.897, n - 4	19.700	0.554 to 38.845	0.055
	More than one quadrant	29.5 SD- 0.847, n - 4	29.75 SD- 2.658, n - 4	0.250	- 20.144 to 20.644	0.977
Size of abscess	≤ 4 cm * 4cm	7.7 SD- 2.213, n - 10	15.13 SD- 9.387, n - 8	7.430	0.967 to 13.892	0.026
	> 4 cm * 4cm	17.33 SD- 0.688, n - 15	25.47 SD- 3.472, n - 17	8.140	- 0.723 to 17.003	0.070
Shape of abscess	Oval	8.4 SD- 2.821, n - 16	17.43 SD- 9.795, n - 14	9.030	3.872 to 14.187	0.001
	Irregular	19.33 SD- 8.262, n - 6	27.29 SD- 6.570, n - 7	7.960	- 8.504 to 24.424	0.310
	Multiloculated	29.33 SD- 3.279, n - 3	29.75 SD- 2.658, n - 4	0.420	- 24.926 to 25.766	0.967
Location	Subareolar	26.4 SD- 1.674, n - 5	27.17 SD- 11.737, n - 6	0.770	- 15.269 to 16.809	0.915
	Periphery	8.16 SD- 2.724, n - 12	15.7 SD- 0.698, n - 10	7.540	0.881 to 14.198	0.028
	Intermediate	13.37 SD- 7.558, n - 8	26 SD- 4.508, n - 9	12.630	0.423 to 24.837	0.043
Constitutional symptoms	Yes	29.6 SD- 9.396, n - 5	25SD- 12.823, n - 10	- 4.600	- 18.650 to 9.450	0.491
	No	9.45 SD- 3.425, n - 20	20.27SD- 13.333, n - 15	10.820	4.520 to 17.119	0.001

The mean healing time of patients in days was compared with respect to different variables. To justify the result, p value was calculated with significance level set to < 0.05 .

Out of 50 patients, who were more than 25 years of age took longer (p value = 0.020) to heal with incision & drainage modality. Patient who had complaints/ symptoms for less than 7 days took significantly less

time (p value = 0.001) to heal with ultrasound guided needle aspiration. Lactating mothers and multiparous women healed early (p value = 0.016, 0.024) with needle aspiration modality. Small sized (≤ 4 cm * 4cm), oval shaped and right sided breast abscesses healed early (p value = 0.026, 0.001, 0.008) with ultrasound guided needle aspiration. Breast abscesses healed early (p value = 0.028, 0.043) with ultrasound guided needle aspiration if they were located in periphery and intermediate breast tissue. Uncomplicated cases with no constitutional symptoms healed early (p value = 0.001) with ultrasound guided needle aspiration.

Table 3: Recurrence After 2 Weeks In Both The Groups

		No	Yes	Total
Group A (Ultrasound guided needle aspiration)	Count	24	1	25
	% Of Total	96%	4%	100%
Group B (Incision and Drainage)	Count	19	6	25
	% Of Total	76%	24%	100%

Out of 25 patients in the Group A, only 1 (4%) patient had recurrence after 2 weeks, while around 6 (24%) patients in the group B. Using a chi-square test, there was significant difference between the groups in terms of recurrence ($p < 0.05$; $p = 0.042$). Fisher exact test p value = 0.042 (Significant).

DISCUSSION:

Breast abscess is a very common clinical entity. At an early stage, acute mastitis can be treated conservatively with antibiotics (4).

Healing rate of the two groups showed statistically significant difference, both overall and at each visit (P value- 0.010), this was different with what was found elsewhere (1,4). In treatment of resistant cases, where the abscess is unresponsive to the combination of repeated drainage and oral antibiotics, surgical treatment still has a role (6). Surgery is also needed in cases with superficial abscesses with skin necrosis. (6)

CONCLUSION:

It was noted that healing time was significantly less with Ultrasound Guided Aspiration in a young, lactating female having small sized and oval shaped abscess located mostly in periphery and intermediate breast tissue. Recurrence rate of breast abscess is much less after Ultrasound guided aspiration, therefore, it is an effective treatment option, although the sample size is inadequate to make ultimate conclusion. The summary of derived results clearly supports that USG guided aspiration can be gold standard treatment at tertiary care centre.

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