

Outcome of incision and drainage versus needle aspiration with antibiotics coverage in breast abscess

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Abstract:

Background: Breast abscess is localized collection of purulent material within breast, which can be a complication of mastitis. Breast abscesses most commonly affect women between 18 to 50 years. Drainage of pus is generally considered as the mostly effective procedure in the management of breast abscess

Aim and Objectives: To determine the outcome of incision and drainage versus needle aspiration with antibiotics coverage in breast abscess.

Place and duration of study: Department of General Surgery, Ayub Teaching Hospital, Abbottabad from November 2020 to May 2021.

Material and Methods: This randomized control trial was carried out on 60-patients (30 in each group). Breast abscess was confirmed on ultrasound. Patients of group-A underwent incision and drainage while group-B patients had aspiration with antibiotic coverage.

Results: In group-A (incision and drainage) 1(3%) women had recurrence and mean time of wound healing was 7.63 ± 1.033 where as in group-B (Aspiration with antibiotic coverage) 3(10%) women had recurrence and mean time of wound healing was 15.10 ± 2.107 .

Conclusion: Incision and drainage is better than needle aspiration done with antibiotics coverage in the treatment of breast abscess.

Keywords: Incision and drainage of breast abscess, needle aspiration, breast abscess.

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Introduction:

Breast abscess is a localized collection of purulent material within the breast, which can be a complication of mastitis. Breast abscesses most commonly affect women between 18 to 50 years of age. In women of reproductive age these are predominantly lactational but non-lactating breast abscesses are also seen in pre-menopausal woman.

It is occasionally seen in neonates. Non-lactational abscesses are more common in obese patients and smokers than in the general population.¹ The breast may become infected by hematogenous or lymphatic spread from contiguous structures, direct inoculation and ductal infection through lymphatic route is the most

common.²

Bacilli infect the ducts and spare the lobules. During lactation, milk provides an ideal culture medium and bacterial dispersion in the vascular distended segment become easy. Acute inflammation ensues and infection spreads rapidly within the stroma and through the milk ducts.

Incomplete milk drainage may predispose to breast engorgement, and hence to breast abscess development.² The global prevalence of mastitis in lactating women is approximately 1-10% but may be higher. 3-11% of women with mastitis are reported to develop breast abscess with a reported incident of 3-3.1% in breast feeding women.³ Drainage of pus is generally considered

as the mostly effective procedure in the management of breast abscess.⁴ Drainage of breast abscess was often performed with incision and drainage technique.

However, incision and drainage is now considered as the last resort for the management of breast abscess because of short comings such as prolonged healing time, regular dressings and dressing pain, interfering with breast feeding and unsatisfactory cosmetic outcome. Needle aspiration or ultrasound-guided (US-guided) percutaneous catheter placement could be considered as alternative approaches to incision and drainage.⁴ Although, it is demonstrated that these minimal invasive procedures can be effective and safe in the treatment of breast abscess of small diameter (<3 cm) or monocular, these methods still have several potential disadvantages mainly including: lower cure rate and higher recurrent risk compared with incisive drainage, repeated aspirations, difficulty in treating multiloculated or long-standing abscesses.⁴

Many medical regimes considered for effective treatment of breast abscess but acceptance is only for those which have proper evidences of effectiveness.⁵ Mainly the time of abscess healing is more important for different types of treatments. There are multiple regimens of antibiotics available for treatment of breast abscesses.⁵ A study was conducted in Bahawal Victoria Hospital. Bahawalpur “comparison of recurrence rate between incision drainage and multiple needle aspiration” In this study the recurrence was found in 07(23.33%) patients in group-A (incision drainage) while in 21(70.0%) patients in group-B (Needle aspiration with antibiotics). The purpose of this study is to provide a local data on outcome of incision drainage versus needle aspiration with antibiotics coverage, its distribution in local population, target age groups and general presentation of such patients to hospital.

The results will be useful in patient education and can also be used by practitioners as local evidence.

Material and Methods:

This randomized controlled trial was conducted in Department of Surgery, Ayub Teaching Hospital, Abbottabad for 6-months from 16th November, 2020 to 16th May, 2021, sample size was calculated using WHO sample size calculator according to following parameters statistical power=80%, anticipated population proportion (P1)=23.33%, anticipated population proportion (P2)=70.6%, significance level (d)=5%, minimum sample size (n)=60 (30 in each group).

All lactating mothers with breast abscess and age ranging from 18 to 50 years reporting to Department of Surgery, Ayub Teaching Hospital, Abbottabad were included in study and all patients with ages less than 18 years and greater than 50 years, non-lactating mothers were excluded from study.

Approval to carry out the study was taken from Institutional Ethical Review Committee at Ayub Teaching Hospital, Abbottabad. All the patients meeting the inclusion criteria were included in the study. Written informed consent was taken from all patients regarding her participation after explanation of the purpose of study.

Detailed history followed by thorough clinical examination was done and breast abscess confirmed by ultrasound by consultant radiologist. All the patients were divided into two equal groups. In group-A patients underwent incision and drainage and patients in group-B had aspiration with antibiotic coverage.

Exclusion criteria had strictly followed to control results confounders and bias in the study data was collected using a customized proforma. Data was entered and analyzed by using SPSS software version 22.0. Frequencies and percentage were calculated for categorical variable like side of abscess, outcome. Quantitative variable like age was presented as mean and standard deviation. Outcome was compared between two groups and chi square test was applied keeping P value ≤ 0.05 as statistically significant. Out-

Table 1: Recurrence rate with respect to age distribution

Age	Recurrence	Group A	Group B	P value
18-30 years	Yes	1(5%)	0(0%)	0.300
	No	19(95%)	21(100%)	
Total		20(100%)	21(100%)	
18-35 years	Yes	0(0%)	3(33%)	0.047
	No	10(100%)	6(67%)	
Total		10(100%)	9(100%)	

Group A: Incision and drainage

Group B: Aspiration with antibiotic coverage

Table 2: Recurrence rate with respect to infected side

Side	Recurrence	Group A	Group B	P value
Left	Effective	0(0%)	3(20%)	0.077
	Not effective	14(100%)	12(80%)	
Total		14(100%)	15(100%)	
Right	Effective	1(6%)	0(0%)	0.325
	Not effective	15(94%)	15(100%)	
Total		6(100%)	15(100%)	

Group A: Incision and drainage

Group B: Aspiration with antibiotic coverage

Table 3: Time of wound healing with respect to age distribution

Age	Group-A (Mean & SD)	Group-B (Mean & SD)	P value
18-30 years	7.60 ± 1.095	14.76 ± 1.947	<0.001
31-50 years	7.70 ± 0.949	15.89 ± 2.369	<0.001

Group A: Incision and drainage

Group B: Aspiration with antibiotic coverage

Table 4: Time of wound healing with respect to infected side

Age	Group-A (Mean & SD) Days	Group-B (Mean & SD) Days	P value
Left	7.57±1.016	15.47±2.475	<0.001
Right	7.69±1.078	14.73±1.668	<0.001

Group A: Incision and drainage

Group B: Aspiration with antibiotic coverage

come was stratified with age and side of abscess to see effect modification. Post-stratification chi square test was applied keeping P value ≤ 0.05 as statistically significant. Results were presented in tabulated and graphical/ charts.

Results:

In this study age distribution among two groups was analyzed as in group-A 20(67%) women were in age range 18-30 years, 10(33%) women

were in age range 31-50 years. Mean age was 30 years with $SD \pm 5.77$. Whereas in group-B 21(70%) women were in age range 18-30 years, 9(30%) women were in age range 31-50 years. Mean age was 29 years with $SD \pm 6.12$.

In group-A 14(47%) women had breast abscess on left side and 16(53%) women had breast abscess on right side. Whereas in group-B 15(50%) women had breast abscess on left side and 15(50%) women had breast abscess on right side. Outcome in terms of recurrence and time of wound healing among two groups was analyzed as group-A (Incision and drainage) 1(3%) woman had recurrence and mean time of wound healing was 7.63 ± 1.033 days. Whereas group B (Aspiration with antibiotic coverage) 3(10%) women had recurrence and mean time of wound healing was 15.10 ± 2.107 days. Stratification of recurrence and time of wound healing with respect to age and side of abscess is given in table no 1,2,3 and 4.

Discussion:

A breast abscess is a localized collection of purulent material within the breast, which can be a complication of mastitis. Breast abscesses develop most commonly when mastitis or cellulitis does not respond to antibiotic treatment, but an abscess can also be the first presentation of breast infection.

It is an uncommon problem in breast feeding with a reported incidence of 0.1%.⁷ Breast abscesses most commonly affect women aged between 18 and 50 years. In women of reproductive age these are predominantly lactational but non-lactational abscesses are also seen in premenopausal older woman. It is occasionally seen in neonates. Non-lactational abscesses are more common in obese patients and smokers than in the general population.¹ The breast may become infected by hematogenous or lymphatic, spread from contiguous structures, direct inoculation, and ductal infection through lymphatic route is the most common.² Bacilli infect the ducts and spare the lobules. During lactation, milk provides an ideal culture medium and bacterial

dispersion in the vascular distended segment become easy. Acute inflammation ensues and infection spreads rapidly within the stroma and through the milk ducts. Incomplete milk drainage may predispose to breast engorgement, and hence to breast abscess development.²

This study showed that in group-A mean age was 30-years with $SD \pm 5.77$. Where as in group-B mean age was 29-years with $SD \pm 6.12$. A similar mean age has been described by Afzal et al.,⁸ and Qureshi et al.,⁹ of women showing up with breast abscess.

In group-A 14(47%) women had breast abscess on left side and 16(53%) women had breast abscess on right side. Where as in 75 group-B 15(50%) women had breast abscess on left side and 15(50%) women had breast abscess on right side. In group-A (incision and drainage) 1(3%) women had recurrence and mean time of wound healing was 7.63 ± 1.033 whereas group-B (Aspiration with antibiotic coverage) 3(10%) women had recurrence and mean time of wound healing was 15.10 ± 2.107 .

Similar findings were observed in another study carried out by Naeem M et al.,¹⁰ in which the mean difference of healing time was significant ($P = 0.001$). A total of 93.3% were healed in group-B and 76.6% in group-A ($P = 0.033$). 22-samples (34.37%) had no bacterial yield and the remaining 42 samples (65.6%) yielded 11 anaerobic cultures (17.18%) and 31 aerobic cultures (48.4%). Ultrasound-guided aspiration of breast abscesses with the judicious use of antibiotics is a better treatment modality than incision and drainage. According to a study done in Lahore by Saeed et al. the mean duration of healing in needle aspiration group was 12.9-days while in incision and drainage group the mean duration of healing was 13.6 days.¹¹ Similar findings were observed in another study carried out by Karvande et al.,¹² in which the mean age of the female patients in the study were 18-42 years. 90% of the cases were lactating. *S.aureus* was the common organism isolated in both lactating and non-lactating cases, encountered in 34 patients (57.7%). Out of that 20 were in the aspirated

group (66.7%). 14-patients were in the incised 76 group (46.7%).

The mean healing time and cosmetic outcome was significantly ($p = 0.001$) very good in patients treated with needle aspiration compared to incision and drainage. There was no recurrence of breast abscess observed in needle aspiration group during the study. There was 3.3% recurrence rate observed in the incision and drainage group. The mean healing time was 4.27-days among group A that was significantly less as compared to 7.6 days among group B. Srauss et al.,¹³ reported that there was no recurrence of breast abscesses observed in the Ultrasound guided needle aspiration group during the study period.

There was 31% (5/16) recurrence rate observed in the surgical treatment group. In a study done by Chandika et al.,¹⁴ on 71-patients, they reported that Ultrasound guided aspiration had a success rate of 93.1% (27/33) single aspiration while incision and drainage group had a recurrence rate of 3.1% (1/32) during the follow up period. Similar findings were observed in another study carried out by Ranjeesh et al.¹⁵ in which a total of 60-breast abscesses were treated by these procedures.

In group-A 25-patients were treated successfully with needle aspiration and antibiotics. The mean time for healing is 11-days in 2cm abscess and longest 23.5-days in 5cm abscess.⁷ Abscesses showed growth of *S.aureus*, 17-showed MRSA, 4-showed 77 no growth, 2-abscesses showed other rarer organisms. Success rate of aspiration is 83%. This is an out patient 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 3cm abscess is 25.5-days and 5cm abscess is 30-days. Fathy et al.,¹⁶ compared surgical drainage with needle aspiration in acute lactational abscess, healing time was 11.6-days in needle aspiration group and 22-days in incision and drainage group. The pain was less and

there was more patient satisfaction in terms of cosmetic results in the needle aspiration group. Success rate was 100% in the incision and drainage group while 70% in needle aspiration group.

On the other hand, some studies also report that needle aspiration have got good results¹⁷⁻¹⁹ as compared with surgical incision and drainage but that too in selected cases with acceptable success rate, less healing time, less post-intervention pain, better cosmetic outcome, and without the need for general anaesthesia. While some studies showed no significant difference in terms of healing rate of breast abscess.¹⁴

Conclusion:

Incision and drainage is better than needle aspiration done with antibiotics coverage in the treatment of breast abscess in terms of recurrent rate and healing time.

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Role and contribution of authors:

Rabeeha Bashir, collected the data, references and did the initial write-up.

Shawana Asad, collected the data, references and helped in discussion writing.

Gul Zada, collected the references and helped in tabulation.

Mir Jalal-ud-din, typically review the article and made the final changes.

Sher Ali Khan, collected the data and helped in introduction and discussion writing.

Fawad Ahmad Khan, collected the references and helped in discussion writing.

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