



SECONDARY BACTERIAL INFECTION IN BREAST DISORDERS

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ABSTRACT

The established principle of surgical management of abscesses has been incision and free drainage; this permits healing by secondary intention or treatment by secondary closure. This modality of treatment has been challenged with the introduction of antibiotics. The infection often presents in the second postpartum week and is often precipitated in the presence of milk stasis. There is an increase in the incidence of methicillin-resistant *Staphylococcus aureus* (MRSA) breast abscess which is susceptible to antimicrobials such as trimethoprim-sulfamethoxazole, fluoroquinolones, and clindamycin. Avoidance of repeated aspiration was the advantage of antibiotics into abscess cavity is probably beneficial. Furthermore Residual abscess, Secondary infection, time for complete healing and hospital stay is better with closed drainage of breast abscess. Primary closure with negative suction drain is a better alternative technique over the conventional incision and drainage method of acute abscesses. Future studies with larger sample sizes, and including larger abscesses, may better help define which closure method is superior.

KEYWORDS : Bacterial infection, *Staphylococcus*, Antibiotics, Breast abscesses.**INTRODUCTION:**

Breast abscess is an acute inflammatory process resulting in the formation and collection of pus under the skin in breast tissue. Typically, there is painful erythematous mass formation in the breast occasionally with draining through the overlying skin of nipple duct opening. 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 abscess.

Breast abscesses can be classified according to clinical presentation, location, or pathogenic organism. Most abscesses result from secondary bacterial infection from skin contamination. Although *Staphylococcus aureus* is by far the main pathogen, other microorganisms can be encountered, for example *Staphylococcus epidermidis*, *Streptococcus pyogenes*, and anaerobes such as *Peptostreptococcus* and *Bacteroides*. A sterile culture with absent growth of bacteria is reported in 21%–45% of cultures, although this may be a false-negative finding due to previous treatment with antibiotics. Less commonly, in specific clinical settings, breast infections secondary to tuberculosis and other mycobacteria, fungi, or parasites can occur. For clinical relevance and treatment management, it is most useful to classify abscesses according to clinical presentation. Puerperal Abscesses Mastitis is a complication most often encountered in primiparous women and develops in 1%–24% of breast-feeding women. Breast abscesses develop as a complication of mastitis in 5%–11% of cases, generally in the first 12 weeks after birth or at the time of weaning, and are referred to as puerperal or lactational abscesses. They are caused by bacteria—most often *S. aureus*—that enter via a small skin laceration and proliferate in the stagnant lactiferous ducts. This type of abscess is more frequent in primiparous mothers (65% of cases)¹⁻² and responds well to drainage and antibiotics. The treatment of breast abscess is a clinical dilemma which ranges from conservative treatment to surgical intervention. The conventional treatment of breast abscess has been surgical incision and drainage.³ Drainage of breast abscess has undergone a gradual change from invasive to minimally invasive procedure in keeping with the current philosophy of surgery. The standard surgical approach (invasive) of incision and drainage (I and D), breaking loculi and insertion of a drain under general anesthesia or daily gauze packing has yielded to minimally invasive approach of percutaneous placement of suction drain and aspiration/repeated aspiration of the abscess.³⁻⁴ The Incision and Drainage method entails certain morbidity and cessation of breast function. A recently highlighted approach is drainage of pus by percutaneous drain placement under antibiotic cover.⁵ This approach has advantages of complete resolution without scar formation and patient can continue breast feeding.

The patients attending outpatient department & admitted to Sri Lakshmi Narayana institute of medical sciences, with diagnosis of breast abscess will be taken for this study By period sampling for the period September 2018 to September 2019. All cases coming to Sri Lakshmi Narayana institute of medical sciences with diagnosis of breast abscess during the study period in September 2018 to September 2019. Minimum of 60 cases will be taken up for study following inclusion and Exclusion criteria. By period sampling. The patients selected for this study are those who are with primary diagnosis of breast abscess. Based on detailed history, thorough clinical examination, the diagnosis of breast abscess will be made. These patients will be subjected to the required preoperative investigations. Patients will be alternately undergoing incision drainage and percutaneous placement of suction drain. Each case will be analysed with reference to post operative complications like post operative pain (based on visual analog scale), residual abscess, duration of hospital stay, time required for complete healing and appearance of scar and cost spent for treatment. Each patient will be followed up in the outpatient department at 1 week, 2 weeks, 3 and 4th weeks after discharge with regard to wound healing. A minimum of 60 cases with the following inclusion and exclusion criteria will be selected for the study and will be allocated alternatively to each of the comparative study groups.

RESULTS:

Table.1 shown Secondary infection, Complete healing, **Table.2** shown Culture, **Table.3** shown Culture.

Table.1 shown Secondary infection

Sec infection	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
No	30	100.0%	12	40.0%	42	70.0%	24.982	<0.001
Yes	0	.0%	18	60.0%	18	30.0%		
Total	30	100.0%	30	100.0%	60	100%		

Table.2 shown Culture

Culture	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
E.coli	15	50.0%	6	20.0%	21	35.0%	41.789	<0.001
MRSA	0	.0%	18	60.0%	18	30.0%		
Proteus	9	30.0%	0	.0%	9	15.0%		
S.aureus	6	20.0%	0	.0%	6	10.0%		
S.epidermis	0	.0%	6	20.0%	6	10.0%		
Total	30	100.0%	30	100.0%	60	100%		

MATERIAL AND METHODS:

Table. 3 shown Culture

Culture	Closed		Open		t-test test	p-value
	N	Percentage	N	Percentage		
E.coli	15	50.0%	6	20.0%	2.3892	0.0139
MRSA	0	.0%	18	60.0%	5.0553	<0.001
Proteus	9	30.0%	0	.0%	3.1985	0.0010
S.aureus	6	20.0%	0	.0%	2.4998	0.0095
S.epidermidis	0	.0%	6	20.0%	2.4985	0.0096

DISCUSSION:

The breast contains breast lobules, each of which drains to a lactiferous duct, which in turn empties to the surface of the nipple. There are lactiferous sinuses which are reservoirs for milk during lactation. The lactiferous ducts undergo epidermalization where keratin production may cause the duct to become obstructed, and in turn, can result in abscess formation. Abscesses associated with lactation usually begin with an abrasion or tissue at the nipple, providing an entry point for bacteria. The infection often presents in the second postpartum week and is often precipitated in the presence of milk stasis. The most common organism known to cause a breast abscess is *S. aureus*, but in some cases, *Streptococci*, and *Staphylococcus epidermidis* may also be involved. Women are encouraged to continue breastfeeding or using a breast pump to continue draining milk from the affected ducts.

Breast abscess is the result of underlying inflammation (mastitis) in the breast skin. Injury may happen either during the lactation process from the infant or in the non-lactation state of the patient as a cracking in the breast skin. This injury accelerates the entry of the causative bacteria which by its role form the abscess. In neglected cases, there may be necrosis in the abscess location leads to fibrosis, scarring and nipple retraction.

Secondary infection ensues with stagnation, leading to abscess formation and development of cutaneous fistulas that involve the periareolar region and form as a means to release pressure from pus distending the ducts. It is speculated that smoking may have a direct toxic effect on the epithelium of retroareolar.

The ducts become filled with fluid which leads to nipple discharge and infection by the entrance of the bacteria and can form pus and abscess as a final result.⁶ Breast abscess associated with methicillin-resistant *S. aureus* (MRSA) has been reported and is likely to be an increasing problem. A wide variety of organisms may occasionally be encountered. Typhoid is a well-recognized cause of breast abscess in countries where this disease is common. This is a particularly important diagnosis to make because the organism is secreted in the milk. *Staphylococcus aureus* commonly causes breast abscess, followed by coagulase-negative *Staphylococcus epidermidis*, *Streptococcus viridians*, *Streptococcus pyogenes*, and anaerobes such as *Pepto streptococcus* and *Bacteroides*.^{7,10} In India, abscesses can occur due to typhoid, tuberculosis, other mycobacteria, and parasites.¹⁻³

These bacterial agents can arise any place from the nasopharynx of the baby to the skin of the mother. Fifty percent of *Staphylococcus aureus* causing breast abscess are penicillin-sensitive.^{8,11} In the study the youngest patient was 20 years old and oldest patient was 44 years old. The mean age was 34 years in the patient of study groups. The mean age was different in various studies (mean age – 34) in the study. In the study right sided breast abscess is of 50% (30 patients) and left sided breast abscess is of 50% (30 patients). In present study post operative pain is measure according to visual analogue scale and analgesic requirement. In group I (closed drainage) has reduced post operative pain (80%) when compared to patient underwent open drainage 40% with significant in P value of less than 0.001. similar findings were observed in other study⁶⁻⁸ and also co-relates with other studies⁷⁻⁸.

In the study closed drainage group I had no secondary infection when compare to open drainage Group II which is due to exposure of tissues to external environment. With a secondary infection of 30% in the open drainage with significant P value 0.001. Culture and sensitivity shown *E.coli* (50%) 15 patients, proteus species (30%) 9 patients and *S. aureus* (20%) 6 patients in group-I (closed drainage). In open drainage *E.coli* (20%) 6 patients MRSA (60%) 18 patients *S. epidermidis* (20%) 6 patients. Overall 65% of patients who underwent procedure for breast abscess either closed or open drainage had follow up. In the current study, the healing time was shorter for patients in Group A, possibly because of better access of antibiotics in the abscess cavity due to the curettage of pyogenic membrane and use of closed suction drains.

CONCLUSION:

Closed drainage is a cost-effective alternative method of treatment to incision and drainage in breast abscess patients. Conventional incision and drainage of breast abscess leads to more pain, delayed healing and prolonged cessation of breast feeding. Since breast abscess is more common in young women, scar is a major concern and therefore closed drainage can be a preferred option which leaves behind a better scar, and breast regains its suppleness very fast. Primary closure with negative suction drain is a better alternative technique over the conventional incision and drainage method of acute abscesses. Future studies with larger sample sizes, and including larger abscesses, may better help define which closure method is superior.

ACKNOWLEDGEMENT:

I am very thankful to Dr.E.Prabhakar Reddy, Professor of Biochemistry and Central Laboratory Head for helping in total study and Publishing Articles related to my study.

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