Diagnostic Considerations in Breast Disorders and Secondary Bacterial Infection

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Abstract

Breast abscess is an acute inflammatory process resulting in the formation and collection of pus under the skin in breast tissue. 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. There is an increase in the incidence of methicillinresistant 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 stray is better with closed drainage of breast abscess.

Key words: *Breast abscesses, Staphylococcus, Bacterial infection, Antibiotics,*

Introduction

Breast abscess is an acute inflammatory process resulting in the formation and collection of pus under the skin in breast tissue. Breast abscesses are most common in young lactating women. The incidence of abscesses in young women during their lactational period ranges from 0.4 to 11%. Mostly researchers reported Staphylococcus aureus is among the common cause for the infection. For the treatment of the breast abscess, options include open incision and drainage, incision and drainage with negative suction drain. surgical incision and drainage are usually carried out under a general anaesthesia, is a traditional method of treatment.

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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. Women should be encouraged to continue breast-feeding throughout treatment to disengorge the ducts. Cessation of breast-feeding is necessary only when treatment with an antibiotic contraindicated for the newborn is prescribed (eg, tetracycline, ciprofloxacin, or chloramphenicol) or if surgical drainage is performed. 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.

Material and Methods

The patients attending out patient department & admitted to Aarupadai veedu medical college and hospital, with diagnosis of breast abscess will be taken for this study By period sampling for the period October 2017 to October 2019. All cases coming to AVMC & H with diagnosis of breast abscess during the study period in October 2017 to October 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 and 4 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 Side of abscess

Side	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
Left	10	33.3%	17	56.7%	27	45.0%	3.300	0.069
Right	20	66.70%	13	43.3%	33	55.0%		
Total	30	100.0%	30	100.0%	60	100%		

Table.2 shown Residual abscess

Residual	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
No	30	100.0%	18	60.0%	48	80.0%	15.000	<0.001
Yes	0	.0%	12	40.0%	12	20.0%		
Total	30	100.0%	30	100.0%	60	100%		

Table.3 Shown Secondary infection

Sec indection	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
No	30	100.0%	12	40.0%	42	70.0%	25.714	<0.001
Yes	0	.0%	18	60.0%	18	30.0%		
Total	30	100.0%	30	100.0%	60	100%		

Table.4: 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%	42.857	<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%		

Table.5 Shown Culture

Culture	Closed		Open		t-test test	p-value
	N	Percentage	N	Percentage		
E.coli	15	50.0%	6	20.0%	2.4360	0.0149
MRSA	0	.0%	18	60.0%	5.0709	<0.001
Proteus	9	30.0%	0	.0%	3.2540	0.0011
S.aureus	6	20.0%	0	.0%	2.5820	0.0098
S.epidermidis	0	.0%	6	20.0%	2.5820	0.0098

Discussion

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 Duct Ectasia: Metaplastic change of the duct cells can cause duct ectasia. This change causes widening of the ducts lining which leads to thickening of the ducts and obstruction. 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]

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 organism most commonly implicated is *Staphylococcus aureus*, which gains entry via a cracked nipple. Occasionally, the infection is hematogenous. In the early stages, the infection tends to be confined to single segment of the breast, and it is relatively late that extension to other segments may occur. Milk provides an ideal culture medium, so bacterial dispersion in the vascular and distended segment is easy. The pathological process is identical to acute inflammation occurring elsewhere in the body, although the loose parenchyma of the lactating breast and the stagnant milk of an engorged segment allow the infection to spread rapidly both within the stroma and through the milk ducts, if unchecked. The bacteria are excreted in the milk. Benson and Goodman in a study found that majority of hospital-acquired infections were due to *S. aureus*, and of these, only 50 % had penicillin-sensitive organisms[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] Lactational breast abscess may occur due to polymicrobial infections.[8] 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.[3,11] There is an increase in the incidence of methicillinresistant Staphylococcus aureus (MRSA) breast abscess which is susceptible to antimicrobials such as trimethoprim-sulfamethoxazole, fluoroquinolones, and clindamycin.

In the study the youngest patient was 18 years old and oldest patient was 42 years old. The mean age was 34 years in the patient of study groups. The mean age was different in various studies (mean age – 32) in the study. In the study right sided breast abscess is of 55% (33 patients) and left sided breast abscess is of 45% (27 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 then 0.001. similar findings were observed in other study [8] and also co-relates with other studies [7-8]. In post-operative period open incision and drainage had more pain give to due repeated dressings and closed drainage were void of it. Tewari M et al [4]described a minimally invasive palpatory method of drainage of breast abscess i.e., percutaneous placement of suction drain but in trochar only so there were still chances of remaining loculi and recurrent abscess. Avoidance of repeated aspiration was the advantage of antibiotics into abscess cavity is probably beneficial. Resolution time is faster in percutaneous drain placement as compared to incision and drainage. Moisture is maintained and antibiotic instillation in cavity can be done. In 1998 Tan. SM et al [12] described about the non operative treatment of breast abscess-needle aspiration and oral antibiotics as a viable alternative to conventional incision and drainage. Nineteen out of twenty one patients were successfully treated by needle aspiration and antibiotics. [12]

In the study mean duration of hospital stay and time required for complete healing is of significance < 0.001. Similar finding was observed in a study conducted by Abraham et al. they found that hospitalization was reduced by 40-60% in closed drainage (group I).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-1(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.

Conclusion

Closed drainage is effective alternative method of treatment to incision and drainage in properly selected patients. Conventional incision and drainage of breast abscess leads to more pain, delayed healing and prolonged cessation of breast feeding. Furthermore Residual abscess, Secondary infection, time for complete healing and hospital stray is better with closed drainage of breast abscess.

Conflict of Interest: Nil

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Ethical Clearance : Institutional Etheical Clearence No-C:081/2017

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