



# Breast Abscesses: Recent Concepts in The Etiology, Diagnosis and Treatment

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## Abstract

Breast infections may arise de novo or, may occur secondary to mastitis and/or, a lesion in the skin. The commoner clinical findings consist of a tender, hard breast mass with erythema of the overlying skin. Needle aspiration yields pus, cultures, of which yield the infecting microorganisms. In practice, treatment is usually empiric consisting of bed rest, frequent nursing, fluids, acetaminophen for pain and fever and a course of antibiotics. The other common line of treatment for breast abscess consists of incision and drainage with primary and/or, secondary closure. This brief communication on breast abscess gives an overview of the possible etiologies, clinical signs and symptoms and the treatment lines for breast abscess.

**Keywords:** Breast Abscesses; Mastitis; Treatment

## Introduction

Breast infections are occasionally seen in neonates but most commonly affect women aged between 18 and 50 years and are categorized as lactational and non-lactational infections. Most breast abscesses develop as a complication of lactational mastitis. The incidence of breast abscess ranges from 0.4 to 11 % of all lactating mothers [1]. Risk factors for lactational breast abscess formation include the first pregnancy at maternal age over 30 years, pregnancy more than 41 weeks of gestation and mastitis [2,3]. It is relatively common for lactating women to develop a breast abscess as a complication of mastitis [1,4]. Non-lactational abscesses can be classified as central, peripheral or, the skin associated. Patients presenting with non-lactational abscesses are more likely to develop recurrent infections, especially, in a state of diabetes mellitus. Central (periareolar) non-lactational abscesses are usually due to periductal mastitis [5]. The infection can affect the skin overlying the breast when it can be a primary event or, it may occur secondary to mastitis and/or, secondary to a lesion in the skin [6-8].

6-8 Puerperal mastitis is an infection of the lactating breast most commonly caused by *Staphylococcus aureus* although *S. epidermidis*, *Escherichia coli* or, *Streptococcus* species may, also, be involved. Symptoms can be non-focal and/or, generalized or, systemic consisting of chills, fever, fatigue and diffuse myalgias

[9]. A recent cohort study of breast-feeding women found a 2.9% incidence of mastitis in the first six weeks although some women develop it during the process of weaning. Mastitis was strongly associated with professional and managerial occupations in both parents and also, with having given birth in the unclean rooms rather than the sterilized labor rooms [10]. Missed feedings, cracked nipples, skin abrasion and fatigue have, also, been associated with mastitis. Milk from breasts affected by mastitis contained more white blood cells and bacterial colonies per mL as was revealed in another study [11,12] In general, the organisms causing sporadic mastitis are part of the oral flora of the nursing infant and therefore, continued nursing is presumed not to transmit infection to the infant.

Although bacteria are present in the milk, no harm appears to be done to the infant if breastfeeding is continued [13,14] Such a procedure is considered safe for the baby because mother's milk provides immunological protection by the oral supply of specific antibody and immunocompetent cells acting against mother's causative microbiologic agents [15] There is consensus that lactation should be continued allowing for proper drainage of ductolobular system of the breast. Continuing breastfeeding does not present any risk to the nursing infant [16,17] In several cases, bilateral mastitis has been reported to be caused by group B streptococcus

and associated with disease in the infant. Better maternal and infant hygiene and early treatment with antibiotics have considerably reduced the incidence of abscess formation during lactation. The traditional management of breast abscess involves incision and drainage of the pus along with anti-staphylococcal antibiotics, however, this is associated with prolonged healing time, regular dressings, difficulty in breastfeeding and possibility of milk fistula, apart from unsatisfactory cosmetic outcomes. It has recently been reported that breast abscesses can be successfully treated with repeated needle aspirations and suction drainage [3].

## Discussion

Breast abscesses may occur with untreated mastitis or, mastitis complicating a blocked duct. They occur in 5% to 10% of the cases of mastitis. The commoner clinical findings consist of a tender, hard breast mass with erythema of the overlying skin. The cardinal symptoms and signs of any kind of inflammatory process i.e. redness, heat, swelling, pain and loss of function are almost always present though to varying grades based on the acuity of the infection for whether the infection is acute or, chronic or, takes a sub-acute clinical course. Needle aspiration yields pus, cultures, of which yield the infecting microorganisms [18-21].

**Conservative Management of Breast Abscesses:** In practice, treatment is usually empiric consisting of bed rest, frequent nursing, fluids, acetaminophen for pain and fever and at least a 10-day course of antibiotics (dicloxacillin or, cephalexin) or, a change for penicillinase producing microorganisms, usually *Staphylococcus aureus* [4,22-24] The beta lactamase-resistant penicillins have been the treatment of choice for the treatment of mastitis. These include cloxacillin, dicloxacillin or, flucloxacillin. Because penicillins are acidic, they are poorly concentrated in human milk. Therefore, cloxacillin and its congeners tend to treat cellulitis well, however, they are less effective in eradicating adenitis, the most likely precursor of breast abscess. Erythromycin, being alkaline, is well concentrated and remains active in human milk. Though some rare strains of staphylococci are resistant to erythromycin, this drug may be the treatment of choice for adenitis where the infection resides primarily in the milk ducts. Both cloxacillin and erythromycin can safely be given to infants, however, erythromycin is less likely to trigger antibiotic-sensitivity reactions. When patients are allergic to penicillins, cephalexin or, clindamycin might be the alternatives, especially, when patient is allergic to erythromycin. Combination antibiotics in the form of co-amoxiclav are avoided because of the fear of inducing methicillin-resistant *Staphylococcus aureus* (MRSA) [25].

**Prime Etiological Microorganisms and Surge of Methicillin-Resistant *Staphylococcus aureus* (MRSA) in the Causation of Re-calcitrant Breast Abscesses:** Pyogenic infections are the commonest with a variety of causative bacteria. Other rare organisms infesting the breast include Actinomycosis, *Nocardia*

*Astreiodes* and Paragonimiasis [26-29] With the emergence of community-acquired methicillin-resistant *Staphylococcus aureus* (MRSA), the conventional antibiotics might be ineffective. Alternative antibiotics effective against community-acquired MRSA often include Clindamycin, Trimethoprim- Sulfamethoxazole and Doxycycline in addition to topical mupirocin. Tetracycline, ciprofloxacin and chloramphenicol are not advised routinely because of the probability of their getting excreted through breast milk with a propensity to harm the infant [20,26].

**Tuberculous mastitis:** A Diagnostic Challenge: Tuberculous mastitis remains a problem in developing countries occurring mostly unilaterally with a wide range of differential diagnoses from duct ectasia to malignancy. Diagnosis is mainly based on the histopathological demonstration of tubercles, caseation and granulomatous formation [30] Idiopathic granulomatous lobular mastitis has become another well-recognized entity. Clinically and radiologically, it might mimic breast cancer. Patients affected with idiopathic granulomatous lobular mastitis present repeated attacks of recurrent breast abscesses [31]. Breast abscess, like other infections, can become florid in immunosuppressed patients or, those with indwelling prosthetic devices just as in gram negative infections leading to fatal septicemias in HIV- infected patients who may initially present with breast abscess [32].

**Conventional Management Strategies for Breast Abscesses:** Historically, abscesses as well as boils and many other collections of pus have been treated via application of magnesium sulphate (Epsom salt) paste. This works by drawing the infected pus to the surface of the skin before rupturing and leaking-out. The other common line of treatment for breast abscess consists of incision and drainage, antibiotic therapy in combination with analgesics and continued emptying of the affected breast best accomplished by gentle mechanical pumping during the first few days while continuing to feed the infant from the opposite breast. Drainage of milk from the affected segment should be encouraged and is best achieved by continuing breast feeding [33,34].

**Radiological Investigations and Ultrasonography (USG) in the Diagnosis of Breast Abscesses:** Radiological investigations such as mammography are limited in this setting due to the inflammatory component which makes it difficult to achieve adequate compression for a good exposure. In addition, mammographic features in infections are highly non-specific demonstrating speculated masses that can be indistinguishable from infiltrating cancers. However, ultrasonography (USG) has been shown to play an important role in the diagnosis of patients with acute inflammation as well. The ultrasonic findings of interstitial fluid and a hypoechoic wall are relatively specific for breast abscesses. Those with no ultrasonic evidence of abscess can be successfully treated with antibiotics while the presence of ultrasonographic fluid collection indicates a need for surgical intervention [35,36].

**Percutaneous and USG-Guided Drainage as a Treatment Modality in Breast Abscesses:** In the era of minimally invasive surgery, percutaneous drainage has proven a safe and effective alternative to incision and drainage in acute abscesses while chronic abscesses are best treated with the classical means of drainage [37]. The method of percutaneous aspiration combined with irrigation and instillation of antibiotics has proved effective in 96% of cases reported in one series skin [38]. Furthermore, ultrasound-guided drainage has been seen to cause less scarring, does not affect breastfeeding and does not require general anesthesia or hospitalization. Ultrasound-guided drainage is a less expensive procedure than surgery. Also, needle puncture of lactating breasts has been associated with fistula formation Ultrasound-guided drainage reduces this risk of fistula formation in both puerperal and non-puerperal abscesses apart from being less invasive than the conventional surgical procedures and having a high success rate [15,16].

**Conventional Surgical Procedures in Breast Abscesses:** Indications and The Need: Although mastitis and breast abscess are painful conditions, it is important to encourage the mother not to stop emptying the breasts while in either circumstance as drainage of milk from the affected segment is essential for the successful resolution of the infection [39]. In case, an incision and drainage is planned, the abscess should be inspected to identify if foreign bodies are a cause which might require their surgical removal. Surgical drainage of the abscess is usually indicated once the abscess has developed from a harder serous inflammatory change to a softer pus stage. The other common indications include abscesses which are re-calcitrant to conventional treatments and cannot be treated with antibiotics alone and require surgical intervention, debridement and curettage [40] The common reasons for not responding to aspiration might be the presence of thick pus, resistant bacteria, multiloculated abscess cavities where only the superficial part has been aspirated and/or, an unusual pathology like tuberculosis, inflammatory carcinoma or, an immune-compromised host.

Surgical treatment is, also, needed in cases with superficial abscesses with skin necrosis wherein the surgical excision of necrosed skin becomes imperative for a proper healing, however, surgical drainage often results in adhesions in the glandular tissue, breast deformity and unsightly scar formation [22]. In many parts of the world, after drainage, an abscess cavity is often packed. However, there is no evidence to support this practice. Bilateral nursing can usually be resumed by the third or, fourth day following incision and drainage as the wound begins to heal and pain diminishes [41,42]. A single large case series has, also, suggested that “stripping of the pus” by firm massage of mastitic breasts to reduce the incidence of breast abscess. Also, primary closure has, also, been found to successful when combined with curettage and antibiotics or, with curettage alone. Primary closure after incision and drainage is an alternative mode of therapy practiced in numerous parts of the world [43].

## Conclusion

To conclude, it should be remembered that though breast infections may sound simple, more serious conditions such as primary squamous cell carcinomas, ductal carcinomas and lymphomas have been reported to present initially with breast abscess masking the original diagnosis, thereby, mandating a meticulous cytological and/or, histological analysis [44,45].

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