Mastitis is the inflammation of the mammary gland tissue, which can be lactational or non-lactational. It is most common in women within child bearing age. Routes of transmitted infection can be from the skin, lymph nodes or primarily in the mammary glands. Organisms isolated include staphylococcus aureus, staph epidemidis or streptococci. Swelling and rupture of mammary ducts will result in an abscess which will mimic breast mass or carcinoma.

Lactational Mastitis

Lactational mastitis is most common in the first six weeks of lactation. It is usually due to milk stasis or breast engorgement with an incidence of up to 10% of breastfeeding mothers.
Pathology of Lactational Mastitis

**Breast engorgement** is the main offending agent in lactational breast inflammation. This could result from *infrequent breastfeeding, maternal or child illness, rapid weaning* or *blockage of milk ducts*.

*Milk stagnation* with *nipple crackles* or *excoriation* will predispose to microorganism infection and inflammation. Resolution of inflammation depends primarily on the resolution of milk stagnation and frequent emptying of the breast.

The gross picture of the breast will show *signs of inflammation*: redness, swelling and tenderness. When an *abscess* is formed, *edematous cavitary mass* filled with *pus* will be seen. Microscopically, the breast will show *inflammatory cellular infiltration* with the *microorganisms* in special stains.

Clinical Picture of Lactational Mastitis

General constitutional symptoms of high fever, chills, fatigue, malaise and myalgia will be present. Locally, the breast will be swollen, tender and firm, while the overlying skin will be *erythematous*. Regional *lymph nodes* may be enlarged and tender.

Diagnosis and Differential Diagnosis of Lactational Mastitis

It is important to initiate the treatment early based on the clinical presentation to avoid formation of *breast abscess*. **Gram stain** and **culture of the milk** will give conclusive results about the causative organisms which will be unnecessary in most cases unless the infection is severe or recurrent. **Ultrasound** is used mainly to exclude *abscess* formation requiring **aspiration**.
Differential diagnosis: inflammatory breast cancer

Inflammatory breast cancer should be suspected in any case of mastitis that does not respond to proper treatment. It has the same signs of inflammation – tenderness and enlarged breast – but with malignant features: skin thickening, peau d’orange and axillary lymph adenopathy.

A biopsy is diagnostic. It is an aggressive tumor with lymph node involvement and sometimes distant metastases at the time of presentation. Invasion of lymphatic vessels is responsible for the clinical picture that resembles inflammation.

Differential diagnosis: breast abscess

The pus collection in the breast tissue follows mastitis or cellulitis. The incidence of breast abscess is 3% among women with antibiotic-treated mastitis. It is more common in non-lactational mastitis.

Risk factors include older maternal age, first born child, prolonged gestational age more than 41 weeks, and smoking. Breast abscess can sometimes be secondary to another disease e.g. diabetes, steroids, trauma and rheumatoid arthritis. It has the same clinical picture of mastitis but with tender localized fluctuant mass. The US is the diagnostic modality of choice.

Management of breast abscess is always drainage with antibiotic coverage. The US assisted needle aspiration, or surgical evacuation can be used.

Complications of a breast abscess include recurrence, milk fistula and antibioma, which results from repeated antibiotic treatment for an abscess leading to hard mass with sterile pus.

Differential diagnosis: breast engorgement

It is usually bilateral and sometimes with pain, but no signs of inflammation or systemic symptoms.

Differential diagnosis: galactocele

This is due to obstruction of a mammary duct with the formation of a cystic mass. There is no pain or tenderness. Diagnosis is made by aspiration of milky fluid from the cyst.

Continuation of breastfeeding with emptying of the breast either with pumping or hand expression is mandatory for symptoms relief and rapid cure. Anti-inflammatory medications should be initiated to help with the pain and constitutional symptoms.

Antibiotic treatment, according to culture and sensitivity results, should cover staphylococci. Blood cultures can be withdrawn for patients with hemodynamic instability or severe infection. Failure to respond to medical treatment within 48 hours of therapy necessitates abscess exclusion with the US.

Recurrent infection, or infection that does not respond to medical treatment, should raise the suspicion for inflammatory breast carcinoma, which should be excluded with biopsy.

Antibiotic regimens should include cephalxin, dicloxacillin in the case of
methicillin sensitive staphylococci. In the case of methicillin resistant staphylococci (MRSA), clindamycin or trimethoprim-sulphamethoxazole should be used after the newborn period to avoid kernicterus.

In severe infection or hemodynamic unstable patients, vancomycin should be initiated empirically then according to culture results. The duration of therapy should last for 10-14 days.

**Oral Lactobacillus salivarius PS2**, which is a lactobacillus probiotic, can be given to pregnant women with a previous history of lactational mastitis in late pregnancy to reduce the risk of infection after delivery.

### Non-lactational Mastitis

Non-lactational mastitis is the inflammation of the breast tissue that is not related to lactation. It includes idiopathic granulomatous mastitis and peri ductal mastitis.

#### Periductal mastitis

Periductal mastitis is idiopathic inflammation of subareolar breast ducts that has been associated with smoking, thus it can be found both in men and women. Cotinine, which is a nicotine derivative, has been implicated in the pathogenesis with necrosis and inflammation of the breast ducts. The most common organisms isolated are staphylococci, enterococci, bacteroides and anaerobic streptococci.

The clinical picture is similar to lactational mastitis with inflammation and infection that may progress to abscess formation and sometimes a draining fistula to the skin surface. Zuska’s disease is a subareolar abscess due to obstruction of mammary ducts with epithelial metaplasia. It has the same clinical picture with signs of inflammation and can mimic malignancy, especially in non-lactating women. Areolar sinus with milk drainage is characteristic.

**Differential diagnosis** includes duct ectasia, which can lead to duct distension with creamy nipple discharge. It is more common in older women. It is benign and age related with no inflammation or infection.

**Smoking cessation** is the first step in management. Periductal mastitis can be managed with antibiotics according to culture and sensitivity results. Amoxicillin-clavulanate is commonly used or clindamycin as an alternative.

**Abscess formation** or fistula should be treated surgically with drainage and duct excision to avoid recurrence. Drainage of the abscess only without excision of the necrotic duct is associated with a high rate of abscess recurrence and fistula formation.

#### Idiopathic granulomatous mastitis

Peripheral multicentric inflammation of the breast of unknown etiology is characterized by small peripheral abscesses, peau d’orange of the overlying skin, sinus formation and axillary lymphadenopathy.

It can resemble malignancy, especially when mammography and US show a solid mass and core biopsy is necessary for the diagnosis. A biopsy of the mass will show granulomatous inflammation but negative for acid-fast bacilli, fungi and sarcoidosis. The inflammation is self-limiting and can take up to 12 months. Antibiotics
are indicated in case of abscess formation, while steroids and surgical excision are not recommended.

References

Dabbs, David J. *Breast pathology*

[Lactational mastitis](http://uptodate.com) via uptodate.com

[Nonlactational mastitis](http://uptodate.com) via uptodate.com

[Primary breast abscess](http://uptodate.com) via uptodate.com


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