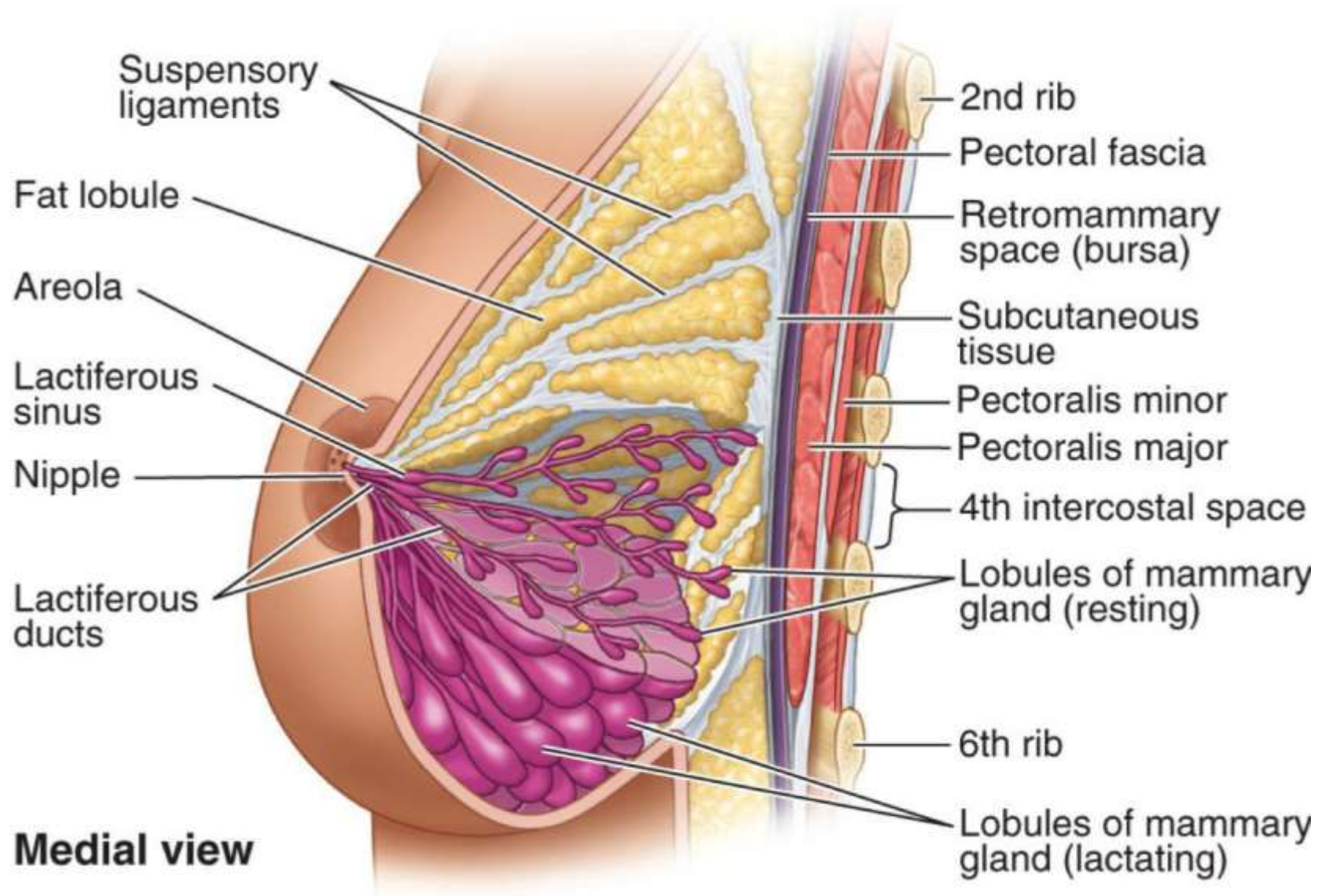


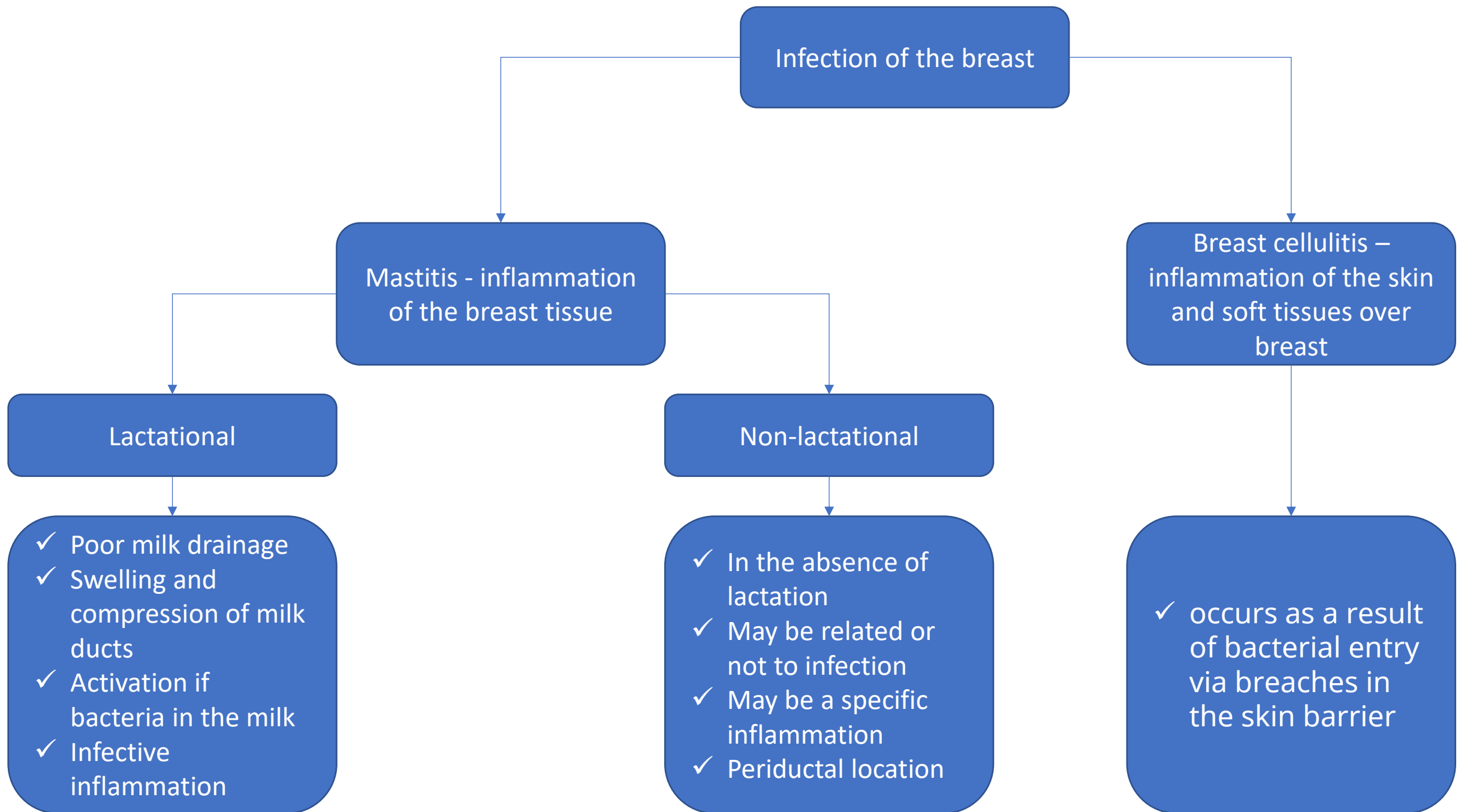


Infection of the breast

Kirill Lobastov

Simplified anatomy of the breast





Lactational mastitis

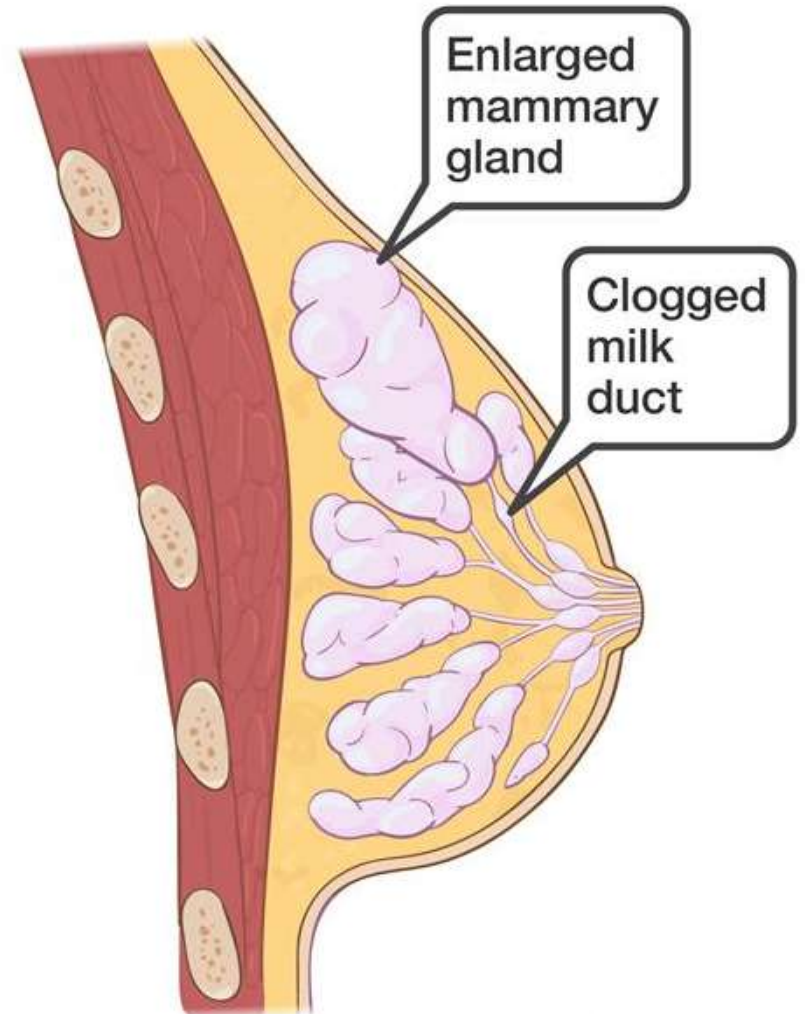
- Lactational mastitis is a condition in which a woman's breast becomes painful, swollen, and red; it is most common in the first three months of breastfeeding.
- Initially, engorgement occurs because of poor milk drainage, probably related to nipple trauma with resultant swelling and compression of one or more milk ducts.
- If symptoms persist beyond 12 to 24 hours, the condition of infective lactational mastitis develops (since breast milk contains bacteria); this is characterized by pain, redness, fever, and malaise.

Epidemiology

- Lactational mastitis has been estimated to occur in 2-10% of breastfeeding women.
- The incidence of mastitis requiring hospitalization is low.
- In one cohort including 136,459 new mothers, 127 women were hospitalized for mastitis, an incidence of 9 per 10,000 deliveries

Reasons

- Partial blockage of milk duct; reduced drainage results in stagnant milk distal to the obstruction
- Oversupply of milk
- Infrequent feedings
- Nipple excoriation or cracking
- Rapid weaning
- Illness in mother or baby
- Maternal stress or excessive fatigue
- Maternal malnutrition



Etiology

- Organisms grow in the stagnant milk, resulting in infectious mastitis.
- Infection can progress to local abscess formation if not treated promptly.
- Effective management and prevention of recurrence depends on resolution of the risk factors.
- Risk factors for lactational mastitis include prior history of mastitis, poor milk drainage, cracked nipples, use of cream on nipples (particularly antifungal cream), and using a breast pump.
- The pathogenesis of lactational mastitis is complex and may include poorly understood interactions between the mammary-associated microbiota and host-specific genetic factors.
- The risk of developing lactational mastitis can be reduced by frequent, complete emptying of the breast and by optimizing breastfeeding technique .

Microbiology

- Most episodes of lactational mastitis are caused by *Staphylococcus aureus*.
 - Methicillin-resistant *S. aureus* (MRSA): up to 40% in mastitis and up to 67% in breast abscess.
- Other pathogens:
 - *Streptococcus pyogenes* (group A or B),
 - *Escherichia coli*,
 - *Bacteroides* species,
 - *Corynebacterium* species,
 - coagulase-negative staphylococci (eg, *Staphylococcus lugdunensis*).

Clinical manifestations

- Lactational mastitis is a condition in which a woman's breast becomes painful, swollen, and red; it is most common in the first three months of breastfeeding.
- Initially, engorgement occurs because of poor milk drainage, probably related to nipple trauma with resultant swelling and compression of one or more milk ducts.
- If symptoms persist beyond 12 to 24 hours, the condition of infective lactational mastitis develops.
- Infective lactational mastitis typically presents as a firm, red, painful, swollen area of one breast associated with fever $>38.3^{\circ}\text{C}$ in a nursing mother; milk secretion may be diminished.
- Systemic complaints may include myalgia, chills, malaise, and flu-like symptoms.
- In the early stages, the presentation can be subtle with few clinical signs; patients with advanced infection may present with a large area of breast swelling with overlying skin erythema.
- Reactive axillary lymphadenopathy may be associated with axillary pain and swelling.



Diagnosis

- The diagnosis of mastitis is based on clinical manifestations; laboratory tests are not needed.
- Culture of the breast milk can be useful to guide selection of antibiotics; it is particularly important in the setting of infection that is severe, hospital acquired, or unresponsive to initial empiric antibiotics.
- Blood cultures are warranted in the setting of severe infection (eg, hemodynamic instability, progressive erythema) but are otherwise not routinely necessary.
- Imaging is useful if lactational mastitis does not respond within 48 to 72 hours to supportive care and antibiotics.
- Ultrasound is the most effective method of differentiating mastitis from breast abscess.

Treatment

- Initial management of nonsevere lactational mastitis consists of symptomatic treatment to reduce pain and swelling (nonsteroidal inflammatory agents, cold compresses) and complete emptying of the breast (via ongoing breastfeeding, pumping, and/or hand expression); cessation of lactation is not required.
- Management of infective lactational mastitis (lactational mastitis with persistent symptoms beyond 12 to 24 hours, with fever) consists of the above measures in addition to administration of antibiotic therapy with activity against *S. aureus*.
- If there is no clinical improvement within 48 to 72 hours, evaluation with ultrasound imaging to determine if there is an underlying abscess should be pursued.

Antibiotic therapy

- In the setting of nonsevere infection in the absence of risk factors for MRSA, outpatient therapy may be initiated with **dicloxacillin** (500 mg orally four times daily) or **cephalexin** (500 mg orally four times daily).
- In the setting of beta-lactam hypersensitivity, **erythromycin** 500 mg twice daily is preferred.
- **Clindamycin** 450 mg orally three times per day may also be used although caution is warranted because of the risk of *Clostridioides* (formerly *Clostridium*) *difficile* colitis.
- In the setting of nonsevere infection with risk for MRSA, effective antibiotics include **trimethoprim-sulfamethoxazole** (TMP-SMX; 1 double-strength tablet orally twice daily) or **clindamycin** (450 mg orally three times daily).
 - TMP-SMX may be used in women who are breastfeeding healthy full-term infants who are at least one month old.
 - TMP-SMX should be avoided in women who are breastfeeding newborn infants (<1 month old) or infants with glucose-6-phosphate dehydrogenase deficiency, and it should be used cautiously in women who are breastfeeding infants who are jaundiced, premature, or ill.
- In the setting of severe infection (eg, hemodynamic instability, progressive erythema on antibiotics), empiric inpatient therapy with **vancomycin** should be initiated; therapy should be tailored to culture and sensitivity results. Gram stain results demonstrating gram-negative rods should prompt empiric antibiotic therapy with a third-generation cephalosporin or a combination beta-lactam-beta-lactamase agent.

Antibiotic therapy

- The optimal length of therapy is not certain; 10 to 14 days may reduce the risk of relapse, but shorter courses (5 to 7 days) can be used if the response to therapy is rapid and complete. In patients with severe mastitis or abscess, once there are signs of clinical improvement with no evidence of systemic toxicity, antibiotics may be transitioned from parenteral to oral therapy.

Prevention

- For pregnant women with a history of lactational mastitis, administration of a *Lactobacillus* probiotic during late pregnancy may reduce the likelihood of lactational mastitis.
- It is unknown whether administration of probiotic therapy would be beneficial for pregnant women with no history of lactational mastitis.

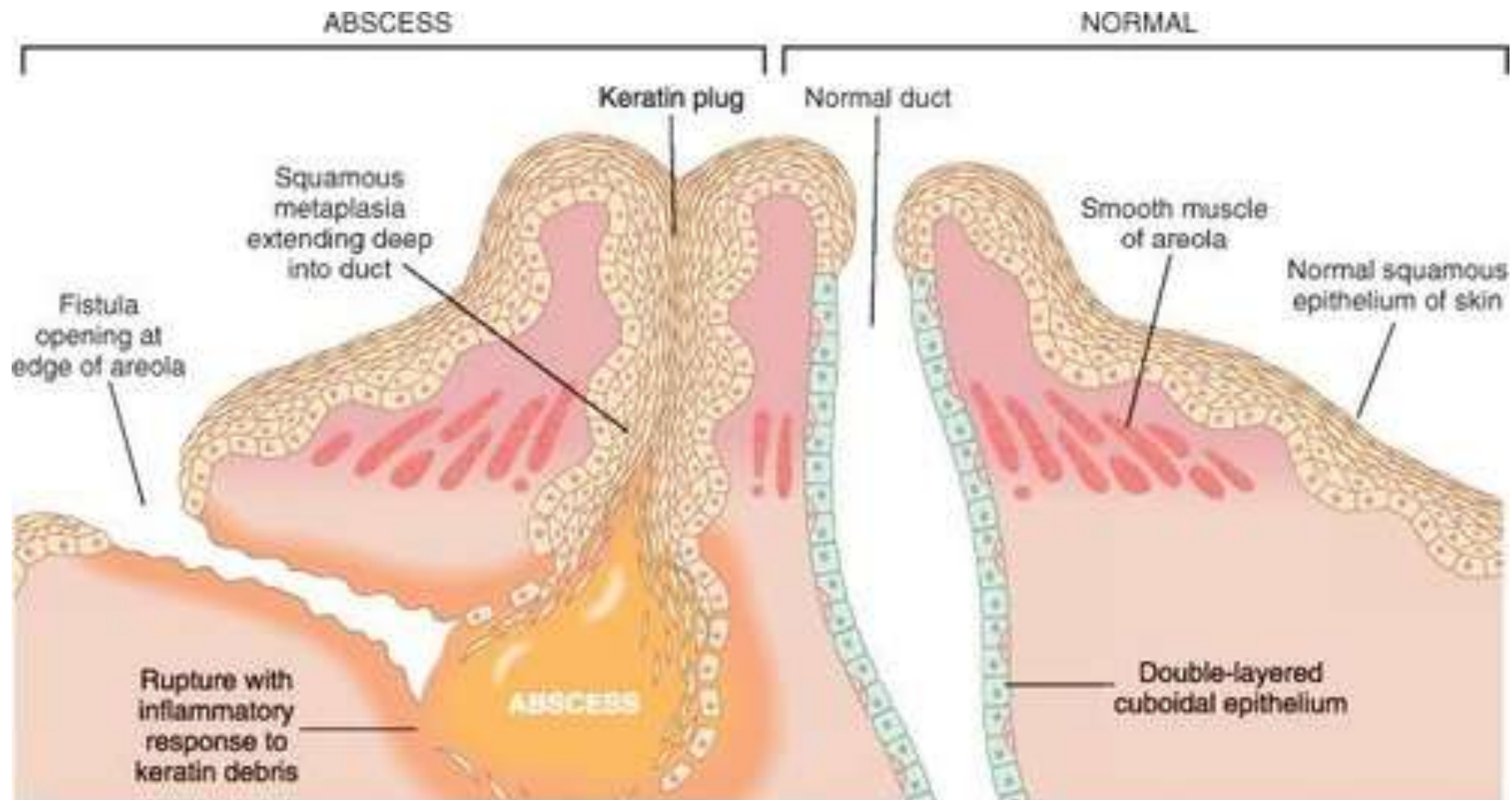
Nonlactational mastitis in adults

- Periductal mastitis
- Idiopathic granulomatous mastitis
- Tuberculous mastitis

Periductal mastitis

- Periductal mastitis is an inflammatory condition of the subareolar ducts; the cause is unknown. Periductal mastitis primarily affects young women but can occur in men as well.
- The majority of patients with periductal mastitis are smokers. It has been postulated that smoking is associated with damage of the subareolar ducts, with tissue necrosis and subsequent infection. The toxic substances in cigarette smoke may damage the ducts directly or there may be a localized hypoxic effect.
- Periductal mastitis is also associated with squamous metaplasia, which is likely a consequence of ongoing inflammation. It has been suggested that squamous metaplasia may lead to partial duct obstruction with subsequent dilatation and secondary inflammation and infection.

Periductal mastitis



Microbiology

- Cultures are positive for pathogenic or potentially pathogenic organisms in 62-85% of cases.
- The most common organisms are staphylococci, enterococci, anaerobic streptococci, Bacteroides, and Proteus.

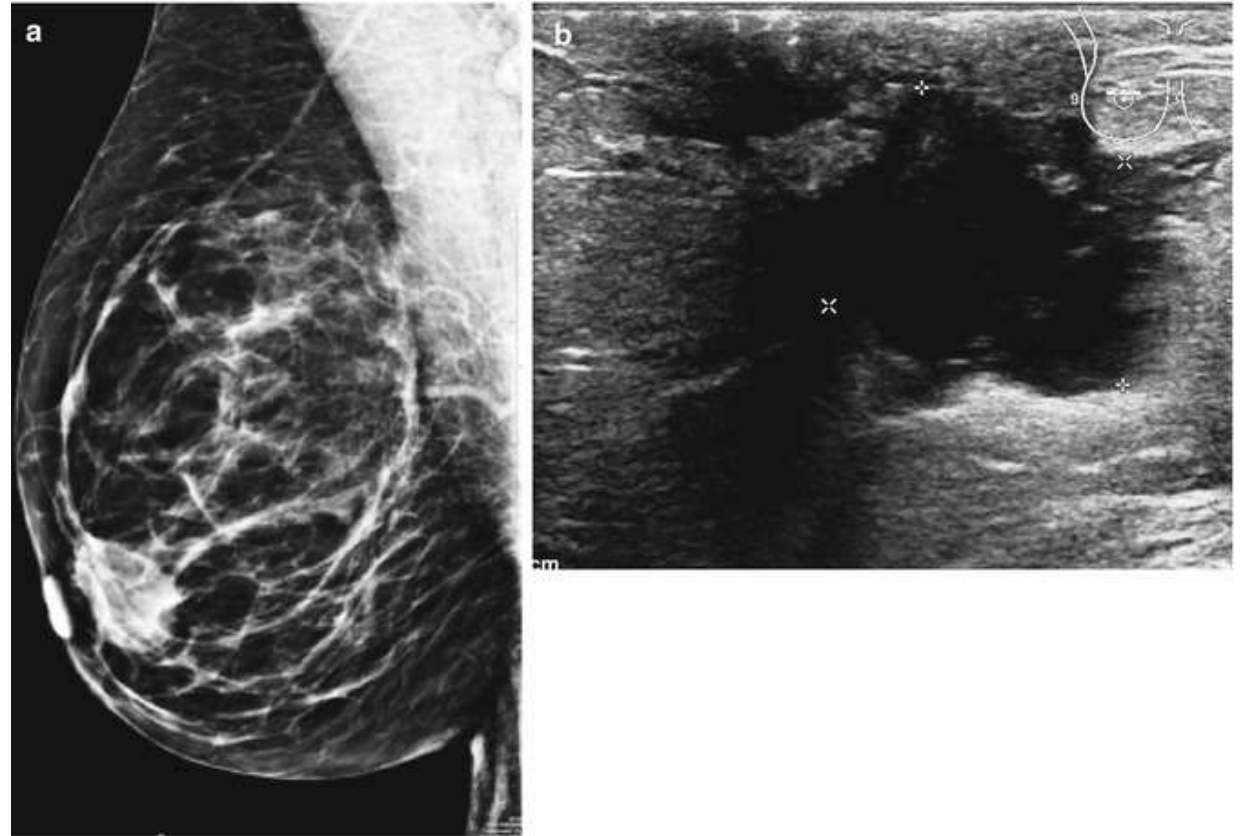
Clinical manifestations

- Periductal mastitis is an inflammatory condition of the subareolar ducts that usually presents with periareolar inflammation.
- Secondary infection of inflamed ducts can occur, leading to duct damage and subsequent rupture with abscess formation.
- Such abscesses often drain spontaneously at the edge of the areola.
- Recurrent abscesses and a draining fistula (ie, communication between a major subareolar duct and the skin)



Diagnosis

- The diagnosis of periductal mastitis is essentially clinical based on appearance.
- Ultrasound is typically performed to rule out abscess, if there is a mass or if signs of infection do not regress within a few days.
- Mammograms are not typically performed since they are less valuable and quite painful in the typically young patients in whom periductal mastitis occurs.



Treatment

- Periductal mastitis is usually a chronic problem.
- In the setting of purulent nipple discharge, Gram stain and culture should be obtained.
- Approximately half of the cases resolve with antibiotic therapy together with needle aspiration or incision and drainage of any associated abscess.
- Patients with repeated episodes of periareolar infection warrant surgical treatment with excision of diseased ducts.
- Empiric antibiotic therapy for periductal mastitis consists of **amoxicillin-clavulanate**. Reasonable alternative regimens include **dicloxacillin** or **cephalexin**; with **metronidazole** if anaerobes are suspected. If risk for MRSA is high **trimethoprim-sulfamethoxazole** or **doxycycline** is an appropriate regimen. In the setting of beta-lactam hypersensitivity, **clindamycin** is a reasonable alternative. Therapy should be tailored to results of Gram stain and culture when available.
- The optimal length of therapy is not certain; a 5- to 7-day course can be used if the response to therapy is rapid and complete; if necessary, the duration may be extended to 10 to 14 days.
- Smoking cessation is helpful for reducing the risk of repeat infection.

Idiopathic granulomatous mastitis

- Is a rare benign inflammatory breast disease of unknown etiology.
- Occurs most commonly in parous young women (within five years of pregnancy); it can also occur in nulliparous women and has been reported in men as well.
- May present as a peripheral inflammatory breast mass; it can also present as multiple simultaneous areas of peripheral (and rarely central) infection with abscesses and/or overlying skin inflammation and ulceration.
- Nipple retraction, sinus formation, orange peel changes, and axillary adenopathy may accompany these findings.
- Ultrasound examination typically demonstrates a solid mass, often with one or more abscesses.
- The diagnosis is established via core needle biopsy of a solid mass visualized on ultrasound.
- Often, no specific management is necessary. It is a self-limiting inflammatory condition that resolves slowly; complete resolution may take 5 to 20 months.
- Surgical excision is often followed by slow wound healing and is not advocated.
- If complicated by secondary infection and abscess, treatment with antibiotics and drainage, usually results in complication resolution.



Tuberculous mastitis

- Is an uncommon entity, even in countries that have a high incidence of pulmonary tuberculosis.
- Most commonly affects women of reproductive age, including those who are lactating; cases in men are exceedingly rare.
- The most common clinical finding is a solitary breast lump.
- The lump is typically painful, ill-defined, and irregular; it is occasionally firm.
- Involvement of the nipple and areola is very uncommon.
- Although the disease frequently involves the skin, the breast usually remains mobile on the chest wall unless there is also tuberculosis involving the underlying ribs.
- Common associated features are multiple sinuses, fistulous tracts, and enlarged axillary nodes, which can be matted.
- Tuberculous mastitis can also present with an ulcer.
- The overlying skin may be thickened with ulceration or sinus tracts with purulent discharge either from the ulcer or from the nipple.
- In later stages there may also be multiple tender areas of irregular masses, multiple sinuses and areas of pus.
- The sclerosing stage can lead to breast shrinkage.



Primary breast abscess

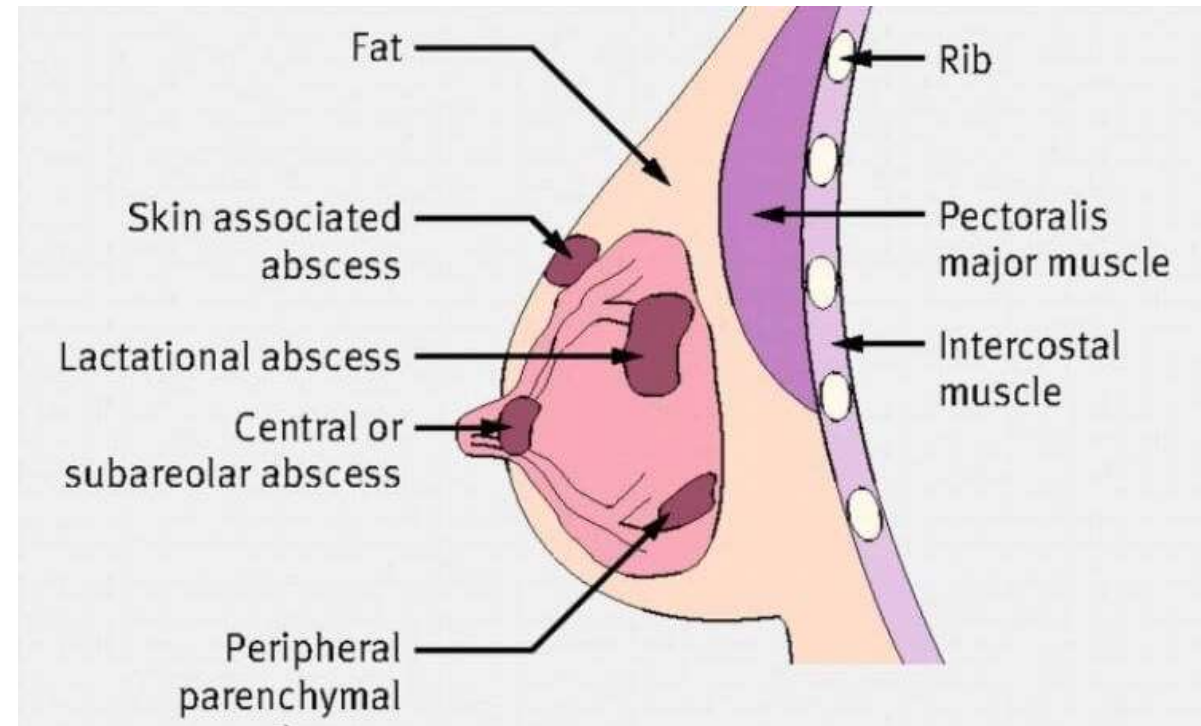
- A breast abscess is a localized collection of inflammatory exudate (ie, pus) in the breast tissue.
- Breast abscesses develop most commonly when mastitis or cellulitis does not respond to antibiotic treatment, but an abscess can also be the first presentation of breast infection.
- It is an uncommon problem in breastfeeding with a reported incidence of 0.1 %; the incidence among women with antibiotic-treated mastitis is 3%.
 - Complication of lactational mastitis: 14%
 - Complication of non-lactational mastitis: 86%
- Breast abscess can develop de novo (ie, primary; no inciting disease) or it can occur as a complication of another disease process (ie, secondary) such as periductal mastitis, skin infection over the breast, or granulomatous lobular mastitis.

Risk factors

- maternal age >30 years,
- first pregnancy,
- gestational age ≥ 41 weeks,
- tobacco use,
- problems with breastfeeding,
- employed outside her home

Localization

- Lactational
- Central (subareolar)
 - is usually due to periductal mastitis
- Peripheral (parenchymal)
 - less common than central abscesses and are sometimes associated with underlying disease states such as diabetes, rheumatoid arthritis, steroid treatment, and trauma
- Skin associated



Microbiology

- Most primary breast abscesses are caused by *Staphylococcus aureus*.
- Methicillin-resistant *S. aureus* (MRSA) is becoming an increasingly important pathogen in cases of lactational and nonlactational mastitis:
 - Lactational abscesses: up to 12%
 - Nonlactational abscesses: up to 8%
- Less frequent pathogens include:
 - *Streptococcus pyogenes*,
 - *Escherichia coli*,
 - *Bacteroides* species,
 - *Corynebacterium* species, c
 - coagulase-negative staphylococci (eg, *S. lugdunensis*),
 - *Pseudomonas aeruginosa*,
 - *Proteus mirabilis*,
 - anaerobes

Clinical features and diagnosis

- Patients with primary breast abscess present with localized, painful inflammation of the breast associated with fever and malaise, along with a fluctuant, tender, palpable mass.
- The time course is variable; mastitis and abscess may present concurrently or abscess may develop 5 to 28 days following treatment for mastitis.
- The diagnosis of breast abscess should be suspected based on clinical manifestations (localized inflammation of the breast associated with fever and a fluctuant, tender, palpable mass).
- The diagnosis may be confirmed via ultrasonography demonstrating a fluid collection.
- Ultrasound imaging may be used for guided aspiration of the collection.
- For women who are lactating, culture of the breast milk is useful to guide selection of antibiotics if an aspirate is not obtained or does not demonstrate pus; culture is particularly important in the setting of infection that is severe, hospital acquired, or unresponsive to initial antibiotics.
- Blood cultures are warranted in the setting of severe infection (eg, hemodynamic instability, progressive erythema) but are otherwise not routinely necessary.



Treatment

Drainage:

- Needle aspiration
 - Aspiration of the abscess under ultrasound guidance using local anesthesia is the preferred method of management if the overlying skin is not ischemic.
 - Pigtail catheter drainage of the abscess cavity is available to reduce number of recurrent aspirations.
- Surgical drainage:
 - If the overlying skin is compromised (eg, ischemia or pressure necrosis of the skin), or in cases in which the abscess is not responsive to needle aspiration and antibiotic therapy, surgical drainage will be required.
 - Do not required big incision dependent on the size of abscess
 - Do not requiring packing with gauze
- Male breast abscesses are treated similarly, via aspiration or incision and drainage under local anesthetic

Treatment

Red but normal



US-guided aspiration every 2-3 days
until no more pus

Thin with or without necrosis



Mini-incision and drainage

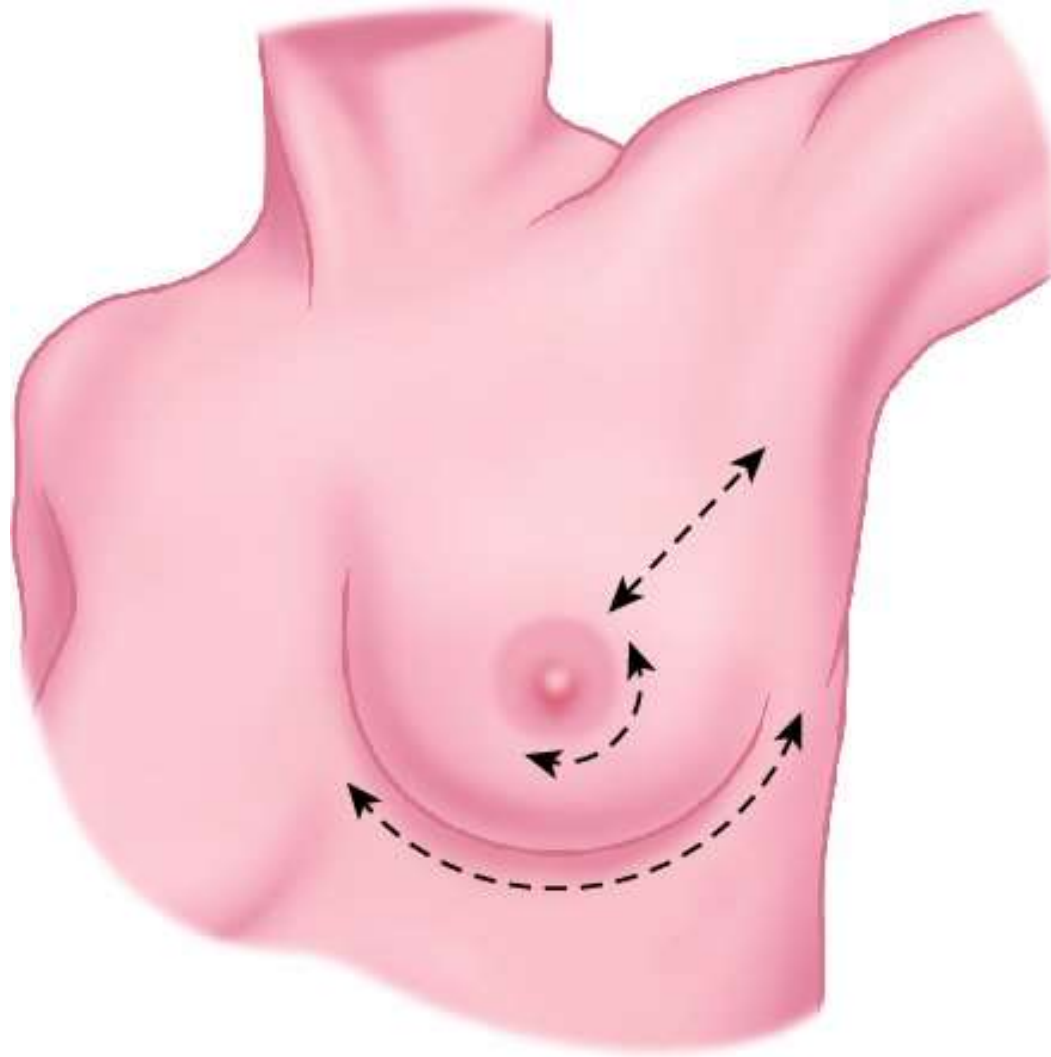
Breast abscess: US-guided puncture and evacuation



Lactating breast abscess before and after needle aspiration



Incisions for breast abscess



Brest abscess: incision and drainage



DR. J. PANDIARAJA ., M.B.B.S, M.S(G.S)

Consultant surgeon and endoscopist

DIPMAS- Diploma in minimal access surgery(Hepatopancreatic biliary surgery)

FMAS- Fellow in minimal access surgery

FACRSI- Fellow in association of colorectal surgeons of India

FIAGES- Fellow of Indian association of gastrointestinal endosurgeons

E-FIAGES- Endoscopic fellow of Indian association of gastrointestinal endosurgeons

email: dr.pandiaraja@gmail.com

Contact: 9042812741

Consultation: Sanjiv hospital 24 hrs,
Dr. Mehta hospital global campus,
Appasamy hospital,
Shree devi hospital

Incision and drainage for breast abscess



Antibiotics

- Empiric antibiotic therapy for primary breast abscess should include activity against *S. aureus*; therapy should be tailored to results of Gram stain and culture results when available.
 - In the setting of nonsevere infection in the absence of risk factors for MRSA, outpatient therapy may be initiated with **dicloxacillin** or **cephalexin**, pending culture results. In the setting of beta-lactam hypersensitivity, **clindamycin** may be used.
 - In the setting of nonsevere infection with risk for MRSA, outpatient therapy with **trimethoprim-sulfamethoxazole** or **clindamycin** may be initiated.
 - In the setting of severe infection (eg, hemodynamic instability, progressive erythema), empiric inpatient therapy with **vancomycin** should be initiated; therapy should be tailored to culture and sensitivity results. Gram stain results demonstrating gram-negative rods should prompt empiric antibiotic therapy against these organisms with a third-generation cephalosporin or a combination beta-lactam–beta-lactamase agent.
- The presence of a subareolar breast abscess with a retracted nipple or a breast abscess associated with hidradenitis suppurativa should raise the possibility of anaerobic infection, and coverage for anaerobes should be included in the antibiotic regimen; options include use of **amoxicillin-clavulanic acid** (in the absence of MRSA), **clindamycin**, or **dicloxacillin** with the addition of **metronidazole**.

Role of breastfeeding

- In the setting of lactational infection, milk drainage (either by breastfeeding or pumping) is important for resolution of infection and relief of discomfort.
- A breast abscess or infection associated with prior lactation is not a contraindication to subsequent breastfeeding.
- Women should be encouraged to continue breastfeeding following breast infection, even in the setting of incision and drainage.
- If there is difficulty with breastfeeding because the incision interferes with nursing on the affected breast, the infant cannot relieve breast fullness, or the mother is too unwell to continue feeding, then it may be appropriate to advise stopping breast feeding.
- If the woman wants to continue to breast feed despite these issues, hand expression or breast pumping can be effective for maintaining the milk supply until breastfeeding can resume.
- Nursing should continue on the unaffected breast.

Complications

- Recurrent infection
 - Is more common in the setting of nonlactational abscess, diabetes, and tobacco use
- Poor cosmetic outcome
 - is more likely to be poor in the setting of delayed treatment
- Mammary duct fistula
- Milk fistula
- Antibiotoma



Breast abscess where there was a delay (A) at diagnosis and (B) poor cosmetic outcome due to delay in treatment.

Complications

- **Mammary duct fistula** is a communication between a major subareolar duct and the skin, usually in the periareolar region.
- It can occur after incision and drainage of a central breast abscess caused by periductal mastitis or it can occur after spontaneous drainage of a periareolar inflammatory mass.
- Patients who develop mammary duct fistula usually have a history of recurrent periareolar inflammation, including recurrent abscess formation, as well as a history of tobacco use.
- Occasionally there is more than one external opening at the areolar margin and this can be from a single duct or multiple ducts.



Complications

- **Milk fistula** is a tract between the skin and a lactiferous duct associated with surgical intervention for a breast abscess while a woman is lactating, resulting in milk draining through the skin of the breast.
- Development of a milk fistula is rare in the setting of aspiration or mini-incision and drainage and occurs more commonly in the setting of extensive surgical drainage with placement of large drains (which is rarely necessary).
- A milk fistula usually resolves spontaneously; if persistent, it usually resolves with cessation of lactation.
- The baby can be weaned from the involved breast and continue to nurse from the other breast; this requires assistance from a lactation specialist in most cases.



Complications

- **Antibioma** is a localized pus with a thick fibrous tissue cover that become sterile at the background of antibacterial therapy.
- It manifests as a smooth, firm, painless swelling.
- This may be treated in a similar manner to other breast abscesses with aspiration but can take longer to resolve.
- Excision is not warranted and may delay wound healing.



Breast cellulitis

- Breast cellulitis is a skin infection that occurs as a result of bacterial entry via breaches in the skin barrier.
- Breast cellulitis is relatively uncommon: <0.1% among all cases of breast hyperemia

Risk factors

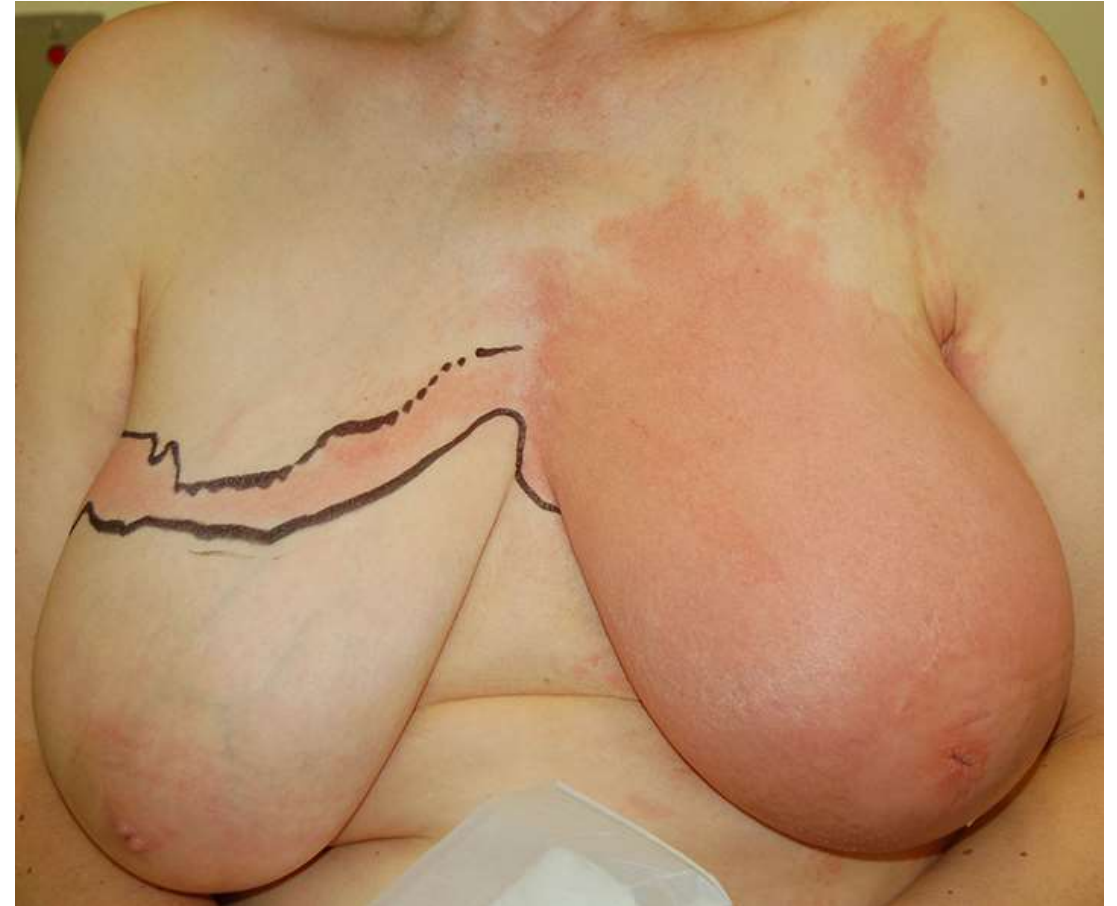
- Prior breast cellulitis or infection
- Breast surgery within previous 30 days (surgical site infection)
- Lactation
- Trauma (eg, bites, nipple piercing, tattoos)
- Lesions in breast skin (eg, eczema, intertrigo, dermatitis, epidermolysis bullosa)

Microbiology

- Beta-hemolytic streptococci are common causes of breast cellulitis.
- Staphylococcus aureus, including MRSA, can also be an important pathogen.

Clinical manifestations

- Clinical manifestation of breast cellulitis include pain, diffuse erythema, tenderness, and warmth.
- Pain can occur before onset of erythema.
- Systemic symptoms, such as fever or chills, are uncommon, occurring in only 6-50%.
- The physical examination of the breast demonstrates localized or diffuse erythema, edema, marked tenderness, and warmth.
- Axillary nodes can be enlarged and tender.
- Spread of infection along lymphatic pathways (lymphangitis) can also be seen



Diagnosis

- The diagnosis of breast cellulitis is based on clinical manifestations.
- The evaluation includes obtaining a clinical history to assess for trauma, underlying skin condition, breastfeeding, and previous breast surgery, breast cancer diagnosis, and/or local radiation treatment.
- A breast examination should be performed to assess the extent of erythema and swelling as well as for presence of tender and/or enlarged axillary lymph nodes.
- No laboratory testing is diagnostic.
- Blood cultures are warranted in patients with rapidly progressive local changes of infection and/or evidence of systemic infection that includes hemodynamic instability, fever, chills, or malaise; otherwise, blood cultures are not necessary.
- Radiographic imaging is useful if there is clinical suspicion of an underlying fluid collection, abscess, malignancy, or if there is no clinical improvement within 48 hours of appropriate antibiotic treatment.
- Ultrasound may demonstrate skin and subcutaneous edema; mammography may demonstrate mild skin thickening.
- Magnetic resonance imaging (MRI) may demonstrate skin thickening and separation or septation of subcutaneous adipose tissue

Clinical approach

- Management of cellulitis includes symptomatic relief and antibiotic therapy. Nonsteroidal anti-inflammatory agents (eg, ibuprofen) along with cold compresses or ice packs reduce local pain and swelling.

Antibiotics

- Patients with uncomplicated cellulitis may be treated with oral dicloxacillin or cephalexin. In the setting of beta-lactam allergy, clindamycin may be administered.
- Patients with rapidly progressing erythema or signs of systemic toxicity warrant collection of blood cultures followed by parenteral treatment with oxacillin or cefazolin. In the setting of beta-lactam allergy, vancomycin or clindamycin may be administered. In the setting of risk for MRSA, vancomycin is warranted.
- Once there is evidence of clinical improvement, treatment should be switched to oral therapy (dicloxacillin or cephalexin). Clindamycin is an option in patients who are allergic to beta-lactam antibiotics; however, it is associated with increased risk for *Clostridioides* (formerly *Clostridium*) *difficile* infection. Patients with known or suspected MRSA infection may transition to oral treatment with clindamycin, trimethoprim-sulfamethoxazole, or linezolid.
- The optimal duration of oral antibiotic therapy is uncertain; 5 to 14 days is appropriate for most patients, but the duration must be tailored and based on individual clinical circumstances. Longer durations may be warranted in patients with breast cellulitis after breast-conserving surgery and radiotherapy. In general, antibiotics are continued until clinical signs of infection have resolved, including pain, fever, erythema, and edema. Frequently, patients report improvement in pain before there is a noticeable decrease in erythema and swelling.

Differential diagnosis

- **Severe engorgement** occurs due to interstitial edema with onset of lactation or at other times with accumulation of excess milk.
- Mastitis may be distinguished from severe engorgement in that engorgement is bilateral, with generalized involvement.
- Engorgement is not typically associated with systemic symptoms of fever and myalgia.



Differential diagnosis

- **Plugged duct** is a localized area of milk stasis within the milk duct that causes distention of mammary tissue.
- Symptoms include a palpable lump with tenderness.
- A plugged duct may be distinguished from mastitis and breast abscess by the absence of systemic findings.



Differential diagnosis

- **Galactoceles** (also known as a milk retention cyst) is a cystic collection of fluid that is usually caused by an obstructed milk duct.
- Galactoceles present as soft cystic masses; they are not tender and are not associated with systemic manifestations.
- Ultrasonography may demonstrate a simple milk cyst or a complex mass.
- The diagnosis can be made on the basis of the clinical history and needle aspiration, which yields a milky substance.



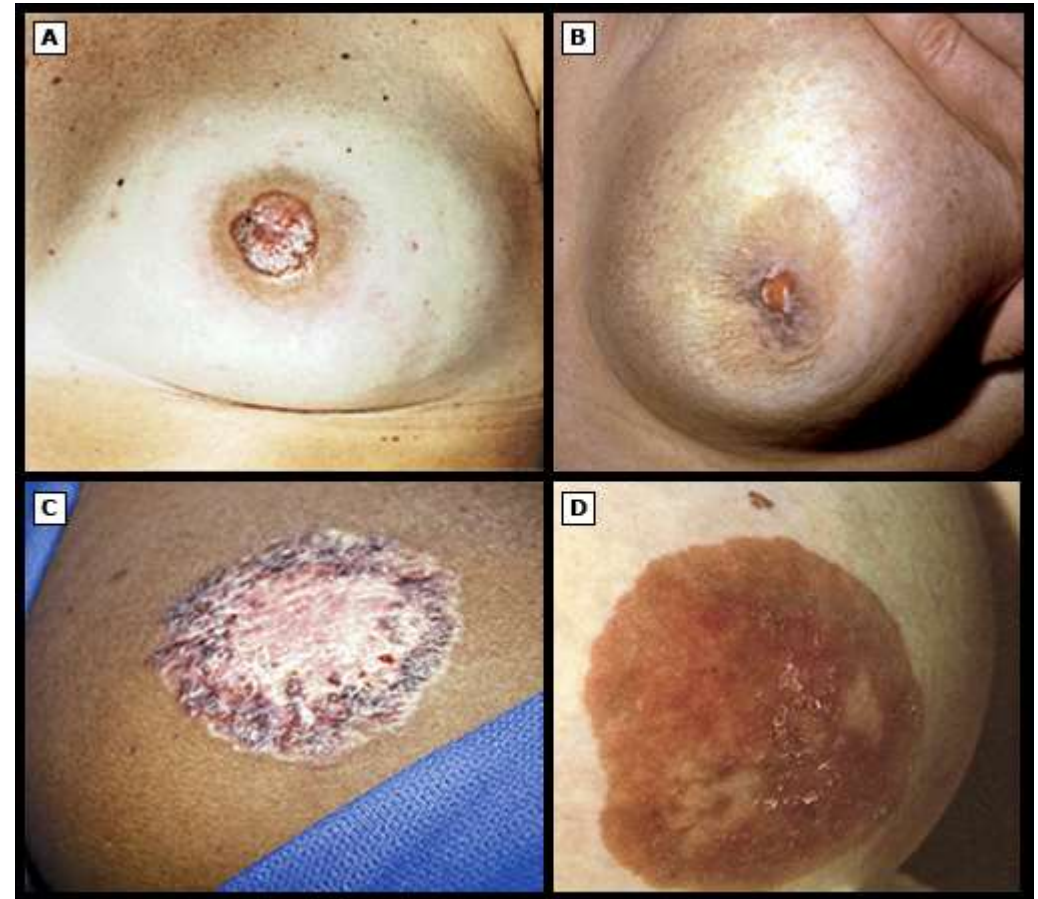
Differential diagnosis

- **Inflammatory breast cancer** should be considered if mastitis does not resolve with appropriate treatment.
- Erythema may improve to some degree with antibiotics in patients with IBC, but there are usually other manifestations of IBC present;
- IBC may be differentiated from mastitis by clinical manifestations of skin thickening due to edema, erythema, and orange peel appearance.
- It is often associated with palpable axillary lymphadenopathy due to metastatic nodal involvement.
- The diagnosis is established via core biopsy.



Differential diagnosis

- **Paget disease of the breast (PDB)** is a scaly, raw, vesicular, or ulcerated lesion that begins on the nipple and can spread to the areola.
- The diagnosis is established by biopsy; the pathologic hallmark is the presence of malignant intraepithelial adenocarcinoma cells (Paget cells) within the epidermis of the nipple.
- Most cases are associated with an underlying invasive or noninvasive breast cancer.



Differential diagnosis

- **Superficial thrombophlebitis** of the breast, also known as Mondor disease, is a self-limiting disease involving the superficial veins of the breast and anterior chest wall.
- Clinical manifestations include a thickened, tender cord with pain, erythema, and swelling; the syndrome can occur following surgery, core biopsy of the breast, radiation treatment, trauma, or unrelated to any antecedent event.
- The condition usually resolves in four to six weeks with symptomatic treatment using analgesics.



Differential diagnosis

- **Morphea – Morphea** (localized scleroderma) is an idiopathic inflammatory skin disorder associated with fibrosis.
- It may be associated with radiation therapy, trauma, breast implants, or autoimmune disease.
- The initial sign of morphea is often abrupt onset of an erythematous patch or edematous plaque.
- Some patients may note pain or itching at the site prior to the development of a clinically evident lesion.
- Clinical manifestations include inflammation with hyperpigmentation, retraction, skin thickening, and fibrosis extending into the subcutaneous adipose tissue.



Differential diagnosis

- **Postoperative dermal lymphedema** presents with cutaneous erythema and induration in the absence of tenderness, fever, or leukocytosis.
- The breast involvement may be localized or diffuse.
- Lymphedema is a manifestation of lymphatic obstruction, which can occur following surgery alone or in conjunction with radiation treatment for breast cancer.
- Clinical evaluation and surveillance are adequate; a biopsy should be performed if malignancy is suspected.



Differential diagnosis

- **Radiation-induced dermatitis**
- Clinical manifestations of radiation-induced dermatitis include erythema, edema, pigment changes, epilation, and dry or moist desquamation.
- These findings are strictly confined to the irradiated region and are not associated with fever or leukocytosis.
- The diagnosis is established based on clinical manifestations.



Differential diagnosis

- **Spontaneous gangrene** of the breast
- Is very rare condition
- Risk factors include diabetes and renal failure.
- Spontaneous gangrene of the breast has also been reported in some patients within the first few days of receiving large doses of warfarin

