

The Prompt Diagnosis & Treatment of the Mastitis Spectrum in Lactating Patients

Academy of Breastfeeding Medicine Clinical Protocol #36

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Objectives

By the conclusion of this session, attendees will be able to...

1. Understand the relationship between the different stages of the mastitis spectrum and how inflammation and edema contribute to this spectrum of conditions.
2. Differentiate the presentation of conditions in the mastitis spectrum.
3. Appropriately work up and treat the conditions in the mastitis spectrum.

Language in Breastfeeding Medicine

- Breastfeeding Mother vs. Lactating Patient
- Breasts vs. Chest
- Breast milk vs. Human milk

Mastitis

- Inflammation of mammary gland
 - Ducts, alveoli, & surrounding connective tissue
- Mastitis is a ***spectrum of conditions***
 - Ductal inflammation & stromal edema
 - Ductal narrow & alveolar congestion → inflammatory mastitis → acute bacterial mastitis → phlegmon/abscess
- Common complication → contributes to early weaning

Mastitis Spectrum

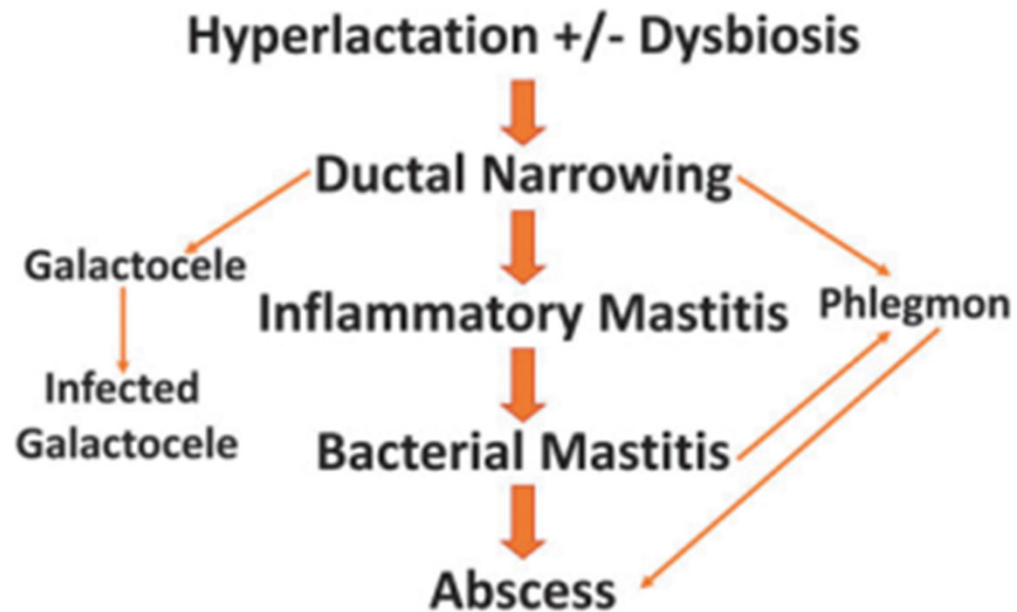


FIG. 1. Spectrum of inflammatory conditions in the lactating breast.

Other Conditions in the Mastitis Spectrum

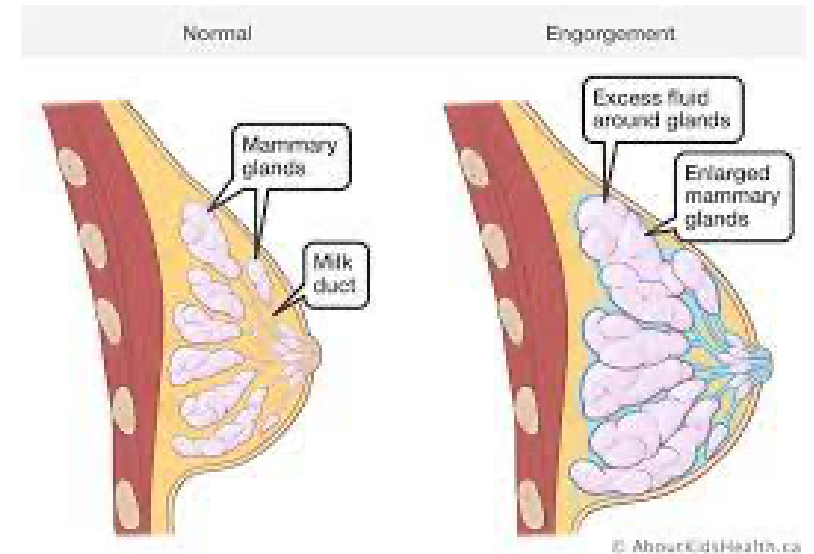
- (Engorgement)
 - Edema from secretory activation (lactogenesis II)
 - Not actually part of the spectrum but treated similarly
- Mammary dysbiosis
 - Disruption of the mammary microbiome
- Galactocele
 - Ductal narrowing resulting in collection of milk

Etiology of Mastitis Spectrum

- Host factors
 - Genetic factors
 - Breastfeeding related
 - Engorgement?
 - Hyperlactation
 - Milk composition
- Microbial factors
 - Microbiome
 - Antibiotic resistance
- Medical factors
 - Antibiotic use
 - Probiotic use?
 - Iron status
- No evidence to support
 - Milk stasis theory
 - Specific foods

Engorgement

- Early postpartum
 - Related to secretory activation of lactocytes
- **Interstitial edema and hyperemia**
 - Similar presentation to ductal narrowing & early inflammatory mastitis
 - BUT
 - **Bilateral** presentation
 - **3 to 5 days postpartum**
 - May be as late as 9-10 days, if delayed lactogenesis

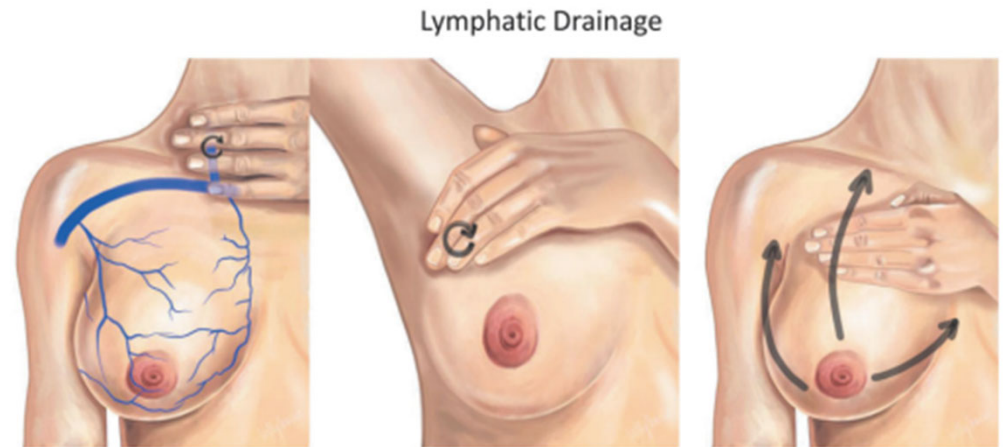


Engorgement

- Management

- Appropriate management = no progression to mastitis spectrum
- Minimize intrapartum fluids
- “Rooming in” = **physiologic breastfeeding**
- Hand expression for symptoms relief
- **Reverse pressure softening**
- **Lymphatic drainage**
- No evidence to support cabbage leaves being more effective than ice
 - Cold items (compresses, ice, leaves, etc.) cause vasoconstriction to reduce edema
 - Cabbage poses risk for *Listeria*

YouTube link to example of reverse pressure softening technique:
<https://www.youtube.com/watch?v=QJYZrAG6cRA>



- Reduces swelling by assisting movement of lymph fluid, decreasing edema, softening fibrosis
- Technique
 - “Very gentle touch/traction of skin - “like petting a cat” (lift skin to allow flow of lymphatic drainage/vascular decongestion)
 - Ten small circles at junction of IJ and subclavian vein
 - Ten small circles in axilla
 - Continue with light touch massage from nipple towards clavicle, axilla
- Start during pregnancy if experiencing painful rapid breast growth, and use as needed postpartum for engorgement

Images: Kelly Rosso, MD

Image from ABM Protocol #36/Kelly Rosso, MD

Ductal Narrowing (“Plugged Duct”)

- **Microscopic inflammation and narrowing of ducts** caused by alveolar distention &/or mammary dysbiosis
- **Presentation**
 - **Focal area of induration** or breast tissue congestion
 - +/- mild erythema
 - **NO systemic symptoms** (fever, chills, etc.)

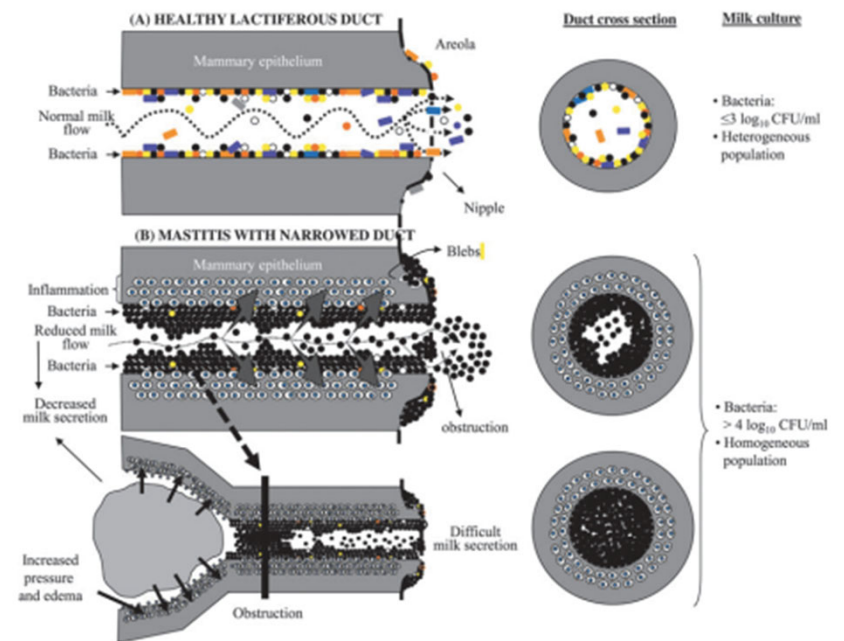


FIG. 2. Compared with a healthy lactiferous duct (A), ductal inflammation can result in narrowed lumens, stromal edema, dysbiosis, nipple bleb formation, and mastitis (B).

Ductal Narrowing

- Management
 - **Spectrum-wide management**
 - **Anti-inflammatories**
 - **Ice**
 - **Physiologic breastfeeding**
 - May note some relief with breastfeeding/pumping BUT overfeeding/pumping will cause increase milk production leading to more exacerbating inflammation and ductal narrowing
 - Feed on demand
 - Minimize pumping
 - Supportive bra
 - Treat hyperlactation, if present
 - Screen all patients for PMADs
 - +/- probiotics
 - +/- therapeutic ultrasound
 - NO aggressive massage or massagers! → tissues trauma & further inflammation
 - NO evidence supporting soaks or other topical products
 - Nipple trauma → moist wound healing principles
 - NO sterilization of pump parts &/or nipples!!



Inflammatory Mastitis

- Persistent ductal narrowing → inflammation of surrounding tissue
 - Occurs **in absence of infection** (rather it is a systemic inflammatory response)
- Presentation
 - Breast (unilateral)
 - **Erythema**
 - **Edema**
 - **Regional breast pain**
 - Systemic
 - **Fever/chills**
 - Tachycardia

Inflammatory Mastitis

- Management
 - **Spectrum-wide management** (ice, NSAIDs, physiologic breastfeeding, etc.)
 - Antibiotics not indicated

FIG. 10. Patient with early inflammatory mastitis. Lymphatic congestion is noted by **arrow**. The patient was treated with ice, ibuprofen, acetaminophen, and feeding first off the left, less congested breast first to avoid overstimulation of the affected right breast. The patient's symptoms resolved within 48 hours.

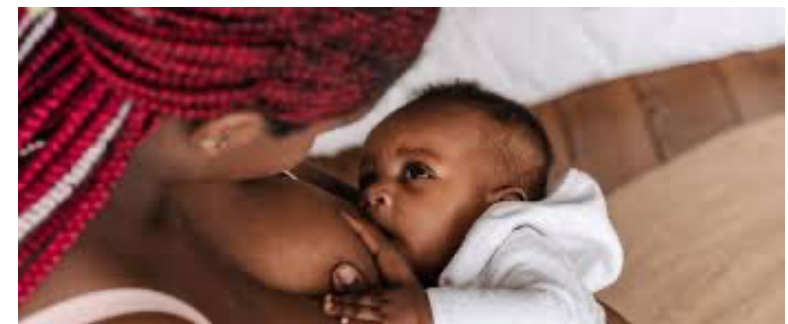


Bacterial Mastitis

- Progression from ductal narrowing & inflammatory mastitis to a **true infection of mammary tissues**
 - *Staphylococcus* or *Streptococcus*
- **NOT contagious = no risk to infant = continue breastfeeding**
 - But do not overstimulate affect breast!
- Presentation
 - Regional cellulitis – **erythema & induration**
 - Nipple trauma? (confounding evidence)
 - New evidence suggest no retrograde spread



FIG. 11. Bacterial mastitis that progressed from early inflammation in the inner quadrant to all quadrants being affected. This patient also pumped and continually fed the infant on the right breast in an attempt to prevent "milk stasis." This approach resulted in worsened ductal inflammation and bacterial overgrowth as well as milk obstruction.



Bacterial Mastitis

- Management
 - **Spectrum-wide management**
 - **Antibiotic therapy**
 - Oral therapy in most cases
 - IV therapy for
 - Multi-drug resistant organism
 - Severe sepsis
 - Inability to tolerate oral antibiotics

First line

- Dicloxacillin or flucloxacillin 500 mg QID for 10–14 days
 - Where dicloxacillin and flucloxacillin are not available, cloxacillin can be used alternatively; however, oral bioavailability is more variable with cloxacillin.⁷⁵ All drugs have low Relative Infant Dose of the drug.⁷⁶
- Cephalexin 500 mg QID for 10–14 days
- Broader coverage including gram negative rods; does not need to be taken separately from meals

Second line

- Clindamycin 300 mg four times daily for 10–14 days
- Trimethoprim-sulfamethoxazole DS BID for 10–14 days
 - Not recommended for mothers of children with G6PD deficiency. Use with caution in mothers with premature infants or infants with hyperbilirubinemia, especially under 30 days old.⁷⁷

- When to move from treatment of inflammatory mastitis to treatment of bacterial mastitis?
 - Persistent systemic symptoms greater than 24 hours with spectrum-wide management
- Absence of systemic symptoms & no response?
 - Consider other diagnosis – inflammatory breast cancer, granulomatous mastitis

Breast Phlegmon

- **Fluid collection resulting from inflammation**
- **Presentation**
 - Worsening mastitis forming a **firm, mass-like area without fluctuance**
 - Often resulting from aggressive massage of breast tissues!
 - Deep massage increased edema & cause microvascular injury



FIG. 12. Clinical appearance of left breast upper inner quadrant phlegmon. Ultrasound showing indistinct fluid collection with surrounding hyperemia and edema.

Breast Phlegmon

- Management
 - **Spectrum-wide management**
 - **+/- oral antibiotics**
 - May coalesce into abscess and require I&D
 - Follow-up

Breast Abscess

- Progression from bacterial mastitis or phlegmon to **infected collection of fluid/purulent material**
- Presentation
 - Induration
 - **Fluctuance**
 - **Erythema**
 - Systemic symptoms may resolve



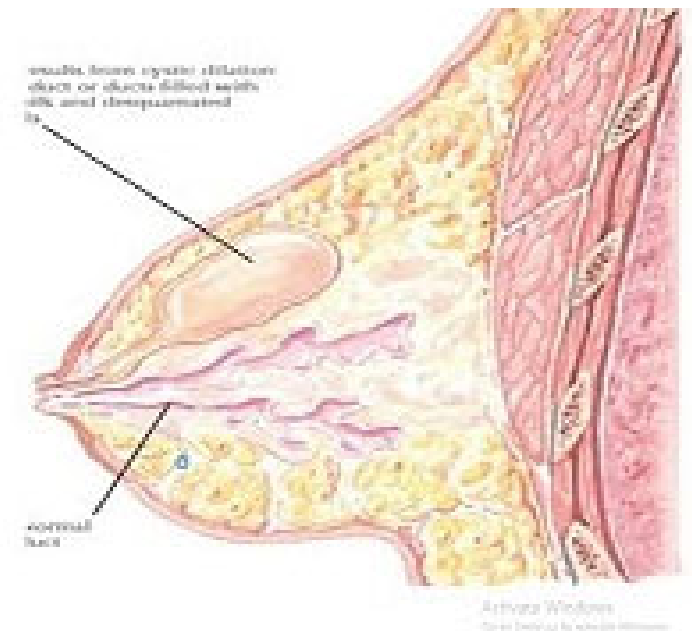
Breast Abscess

- Management
 - **Spectrum-wide management**
 - **I&D!**
 - Include C&S
 - Place drain to gravity (NOT suction!)
 - **Antibiotics for 10-14 days**
 - Continue to breastfeed
 - Follow-up



Galactocele

- Ductal narrowing stops the flow of milk → **cyst-like cavity**
 - May become infected
- Presentation
 - **Firm mass**
 - No to minimal pain
 - Size may fluctuate related to feeding
 - **No erythema or systemic symptoms** (unless infected)



Galactocele

- Management
 - **Spectrum-wide management**
 - Drainage, if symptomatic/infected
 - Symptom relief & confirmation of diagnosis
 - Risk of recollection & multiple drainage causing infection – may need drain placement

Recurrent Mastitis

- No consensus on definition of recurrent mastitis
 - May be as often as every 2 weeks
- Presentation
 - Variable
 - Episodes of hyperlactation
 - **Inadequate response to mastitis treatment**

Recurrent Mastitis

- Management
 - **Milk culture!**
 - Be sure to “culture out” for coagulase-negative Staphylococci
 - Treat with **antibiotic** based on C&S results
 - Ensure no massage or excessive pumping
 - Consider **daily probiotic**
 - *L. fermentum* or *L. salivarius*
 - Multiple recurrences in same location – workup for breast mass as underlying cause!

1. Clean the nipple and areola: Both a topical antiseptic solution and washing with warm water and soap with air-drying have been proposed. There are no data to determine which is better to remove skin flora while preserving the integrity of the nipple and areolar skin.
2. Use sterile gloves to express milk.
3. Collect 5–10 mL milk in a sterile container.
4. No contact should be made between nipple and sterile container.
5. Send as “body fluid culture” rather than “wound culture.”

Subacute Mastitis (Dysbiosis)

- Lumens of ducts narrowed by **biofilms due to mammary dysbiosis**
 - Loss of bacterial diversity allows pathogenic bacterial to increase
 - Often coagulase-negative Staphylococci (*S. epidermidis*, *S. saprophyticus*) or viridans Streptococci (*S. mitis*, *S. salivarius*)
- Presentation
 - **Painful initial latch** (at start of pumping)
 - **Deep breast pain or burning after feeding**
 - **Breasts tender** to palpation
 - Hyperlactation common
 - Nipple trauma &/or blebs common

Subacute Mastitis (Dysbiosis)

- Management
 - **Spectrum-wide management**
 - **Milk culture** to determine **antibiotic therapy**
 - May not grow dominant organism → treat with macrolides
 - Two to six weeks treatment
 - **Probiotics**



Questions?

Please use conference platform or email kristine.burgess@rosalindfranklin.edu

Thank you!