

Review

Caring for new mothers: diagnosis, management and treatment of nipple dermatitis in breastfeeding mothers

Misha M. Heller¹, BA, Honor Fullerton-Stone^{2,3}, MD, and
Jenny E. Murase^{4,5}, MD

¹Keck School of Medicine, University of Southern California, Los Angeles,
²Menlo Dermatology Medical Group, Menlo Park, ³Department of Dermatology, Stanford University Medical Center, Stanford, ⁴Department of Dermatology, Palo Alto Foundation Medical Group, Mountain View, and ⁵Department of Dermatology, San Francisco Medical Center, University of California, San Francisco, CA, USA

Correspondence

Dr Jenny E. Murase, MD
Department of Dermatology
Palo Alto Foundation Medical Group
701 East El Camino Real (31-104)
Mountain View
CA 94040, USA
E-mail: jemurase@gmail.com

There were no funding sources for this paper.

The authors do not have any conflicts of interest to disclose.

Abstract

Breastfeeding is thought to be the most optimal form of infant nutrition. Nursing mothers are generally advised to continue breastfeeding until the infant is two years of age or beyond. Unfortunately, however, a majority of nursing mothers will discontinue breastfeeding much earlier than recommended. The most common reason for early discontinuation of breastfeeding is nipple pain. It is, therefore, essential that dermatologists know how to appropriately diagnose and effectively treat nipple pain associated with nipple dermatitis among nursing mothers. This review article provides a detailed discussion on the clinical features and management of various causes of nipple dermatitis during lactation, including problems with infant latch-on, congenital oral anomalies, plugged lactiferous ducts, atopic dermatitis, irritant contact dermatitis, allergic contact dermatitis, yeast infections, bacterial infections, herpes simplex virus, and Raynaud's phenomenon of the nipple.

Introduction

Breastfeeding is considered the ideal method of feeding and nurturing infants. It offers optimal nutrition and immunological protection to the infant, provides significant health benefits to the mother, and helps the mother and infant develop a close bond. According to the World Health Organization,¹ infants should be exclusively breastfed for the first six months of life and should continue breastfeeding along with appropriate complimentary foods until at least 24 months old.

Through ongoing international efforts to promote breastfeeding, overall rates of breastfeeding have begun to rise worldwide over the past decade.^{2,3} For example, in the USA, an astounding 75% of infants start out breastfeeding. Unfortunately, however, breastfeeding rates fall dramatically to 43% at six months and further drop to 22% at 12 months. Only 33% of infants are exclusively breastfed at three months, and a mere 13% are exclu-

sively breastfed at six months.⁴ Thus, despite overall increasing rates of breastfeeding, the majority of mothers discontinue breastfeeding much earlier than recommended.

One common reason reported by nursing mothers for early cessation of breastfeeding is nipple pain.⁵ In fact, up to 90% of nursing mothers experience nipple pain in the postpartum period.⁶⁻⁸ Nipple pain can cause mothers to feel especially discouraged, ultimately leading to decreased frequency and duration of feedings and subsequent termination of breastfeeding. To extend breastfeeding duration, dermatologists must feel comfortable helping mothers overcome breastfeeding difficulties such as nipple pain.

Dermatologists are perfectly suited to manage nipple pain, in particular nipple pain related to nipple dermatitis, as they have much expertise in diagnosing and treating inflammatory dermatoses. Furthermore, patients with a history of atopic dermatitis and other underlying dermatological conditions, who are generally followed by a

dermatologist, are more prone to experience nipple dermatitis during breastfeeding and develop secondary infections with such organisms as *Candida albicans* and *Staphylococcus aureus*.⁹ The objective of this review article is to educate dermatologists on appropriate diagnosis, management, and treatment of nipple dermatitis among nursing mothers.

Differential diagnosis for nipple dermatitis

There are many possible etiologies of nipple dermatitis among nursing mothers. The differential diagnosis includes mechanical irritation from problems with infant attachment to the nipple or congenital anomalies of the mouth, plugged lactiferous ducts, psoriasis, atopic dermatitis, irritant contact dermatitis, allergic contact dermatitis, yeast infections, bacterial infections, herpes simplex virus (HSV), and/or vasospasm (also known as Raynaud's phenomenon of the nipple).

Poor infant latch-on and congenital oral anomalies

Poor infant latch-on (or inappropriate positioning of the infant's mouth on the mother's nipple) is considered the most common cause of persistent nipple pain. If the infant is poorly positioned and suckles vigorously, the mother can experience abrasions and trauma to the nipple.^{10–13} Similarly, congenital mouth abnormalities, such as cleft lip or palate and short frenulum, can lead to significant nipple irritation and an increased risk of nipple dermatitis. Infants with a short frenulum (medically termed ankyloglossia) often experience breastfeeding difficulties, including poor attachment to the nipple and suboptimal weight gain due to inadequate removal of milk from the breast. During normal suckling, the infant places the tongue over the lower gum and curves the sides of the tongue around the nipple. If this cannot be accomplished, the infant can cause substantial maternal nipple abrasions and pain as a result of mechanical trauma.¹⁴

Psoriasis and eczema

Nursing mothers with a history of psoriasis may experience a flare-up of psoriasis during lactation. They are also more likely to experience koebnerization (or the development of new plaques of psoriasis in areas of injury) due to irritation from infant suckling. Psoriasis of the nipple generally presents as well-demarcated, erythematous plaques with fine micaceous scales (Fig. 1).

Eczema among nursing mothers most commonly affects the areola and occasionally extends to the breast. Eczema of the areola can present as an acute erythematous eruption,



Figure 1 Psoriasis of the nipple in a breastfeeding mother

with oozing, crusting, and erosion. It can also occur in a subacute or chronic presentation as dry, lichenified, and scaling lesions on an erythematous background. Patients may complain that the lesions are pruritic, painful, or even burning (Fig. 2).^{9,15}

The term eczema can be used to describe the clinical presentation of several categories of dermatitis. Three main categories include endogenous atopic dermatitis, irritant contact dermatitis, and allergic contact dermatitis. Patients with endogenous atopic dermatitis consist of those women with a pre-existing tendency to develop eczema.⁹ Irritant contact dermatitis occurs as a result of an irritating agent on the skin. Dermatologists should consider any topical agents, detergent, soap, chlorine clothing bleach, or prior therapies including topical antibiotics as possible irritants.^{16–18} In contrast, allergic contact dermatitis is a delayed hypersensitivity reaction to an allergen in



Figure 2 Eczema of the nipple in a breastfeeding patient with atopic dermatitis

a topical agent applied to the nipples. Offending agents can include lanolin, chamomile, vitamins A and E, aloe vera, and fragrances.^{19–25} Other potentially harmful agents that should be avoided are certain home remedies, such as tea bags containing tannic acid, honey due to the risk of *Clostridium botulinum* exposure, and banana or papaya peels, which can contain high numbers of microorganisms.^{26,27} The pattern of the dermatitis can be particularly helpful in identifying cases of irritant and allergic contact dermatitis. For instance, if the inciting agent were an allergen in a new lactation bra, the dermatitis would be limited to the area of bra coverage.¹⁵

Plugged lactiferous ducts

Plugged lactiferous ducts (“milk blisters”) can present as localized tenderness in the breast from inadequate expression of milk. A firm, erythematous, and painful area may be present on the affected breast, while a tender, white, small bleb may appear on the nipple. The bleb is believed to result from an overgrowth of epithelium or an accumulation of fatty substance. Plugged lactiferous ducts can also occur deeper in the breast tissue when the flow of milk is blocked. A chronically plugged lactiferous duct can result in a galactocele, or a milk cyst.

When milk stagnates and is not regularly expressed due to plugged lactiferous ducts, mastitis (or inflammation of the breast) can develop. Other risk factors for mastitis include cracked or fissured nipples, use of certain nipple creams, and past history of mastitis.²⁶ Development of mastitis has been reported in up to 20% of nursing mothers within the first six months after delivery.²⁸ It occurs when cytokines cross from milk into interlobular connective tissue and induce an inflammatory response. This subsequently places the patient at risk of developing both yeast and bacterial infections. Dermatologists should have a high index of suspicion for mastitis if the patient has a fever over 38 °C and complains of malaise, including headaches, chills, and body aches.

Yeast infection

Yeast infection, most frequently resulting from *C. albicans*, should be suspected when the nursing mother complains of burning, shooting, or stabbing nipple pain that can radiate from the nipple through the breast to the chest wall (Fig. 3). The patient’s symptoms are usually out of proportion to clinical findings. This condition is usually associated with an infant with a recent history of oral thrush or diaper dermatitis. Often, if the infant has evidence of *Candida* infection and the mother is afebrile, the patient will be given a diagnosis of *Candida* mastitis. In a survey of 312 lactation experts, 93% of responders made a diag-



Figure 3 Nipple dermatitis in a breastfeeding mother with a positive *Candida* culture

nosis of *Candida* mastitis based primarily on history and physical exam of the infant, without performing any cultures of the mother’s nipple and breast milk or infant’s mouth.²⁹

All too frequently, physicians will neglect to consider bacterial infections in the differential diagnosis unless the patient experiences a fever. Considering that patients with bacterial infection can present without a fever and with the same symptoms as those with *Candida* infection, it is critical to distinguish between these two infections by culturing the mother’s nipple and breast milk, as well as the infant’s mouth.

Culturing for *Candida* species has long been considered difficult or impossible. But, within the last 10 years, proper culturing techniques to detect *Candida* species have been developed.³⁰ Since then, studies have been able to more accurately assess the occurrence of *Candida* mastitis in nursing mothers. Prior to development of the proper culturing technique, studies likely underestimated the prevalence of *Candida* in patients with chronic breast pain during lactation (see “Culture techniques” below).³¹

One recent study, which utilized proper culturing techniques, investigated the frequency of *Candida* colonization among 100 nursing mothers and their infants (Fig. 4). Cultures of the mother’s skin and breast milk and the infant’s mouth were performed at two weeks postpartum. Of the nursing mothers, 23% (23/100) colonized positive for *Candida*, of which 87% (20/23) had accompanying symptoms including burning nipples, breast pain, stabbing pain in the breast, shiny nipple/areola skin, or flaky nipple/areola skin. Of these 20 mothers symptomatic for *Candida* mastitis, 15 of their infants colonized positive for *Candida*. In contrast, 77% (77/100) of the nursing mothers did not colonize for *Candida*, of which only 16% (12/77) had accompanying symptoms. Thus, the vast majority of those colonized had symptoms clinically suggestive of mastitis, and the vast majority of

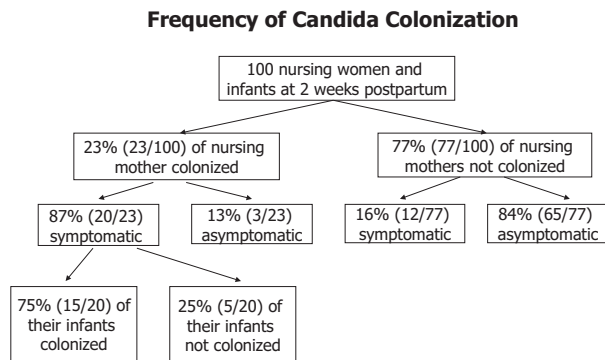


Figure 4 Estimated prevalence of *Candida* colonization in infants and mother experiencing chronic nipple pain during lactation

those not colonized did not have symptoms of mastitis. Notably, this study did not perform cultures for possible bacterial infection, which may represent at least some of the women symptomatic for mastitis but not colonized with *Candida* (Fig. 4).³¹

In addition to performing cultures for *Candida* species, careful examination of the infant can be particularly helpful in making an appropriate diagnosis. Approximately 25% of vaginally delivered infants are infected with *Candida* through the birth process. Nearly half of all healthy infants will be colonized by the age of 18 months, but only 25% of these infants will exhibit symptoms.^{32–35} Infants with *Candida* infection may exhibit a fiery red diaper rash or oral thrush characterized by white patches in the oral mucosa that can leave bloody areas if scraped. Physicians must take care not to mistaken Epstein's pearls for *Candida* infection, which represent entrapped epithelium located on the median palatal raphe of the infant's mouth. Another clinical clue of *Candida* infection is that the infant may make a clicking sound during feeding due to soreness in the mouth from oral thrush.

Bacterial infection

Bacterial infection due to colonization of *S. aureus* organisms is another potential cause for chronic breast and nipple pain during lactation. Studies consistently report that about 50% of nursing mothers who are experiencing deep breast or nipple pain will culture positive for *S. aureus*.^{36–38} If a patient cultures positive for *S. aureus*, it is important to treat with oral antibiotics for 4–6 weeks for two reasons. First, systemic therapy is significantly more effective than topical therapy in reducing pain. Second, oral antibiotics can reduce the risk of developing mastitis associated with fever and malaise. Specifically, in a prospective cohort study of 84 nursing mothers complaining of cracked, sore nipples, there was a 79% improvement with oral antibiot-

ics, as compared with a 16% improvement with topical mupirocin alone. In addition, mastitis developed in up to 35% of mothers not treated with oral antibiotics vs. only 5% of mothers treated with oral antibiotics.³⁶

In a retrospective study consisting of 60 patients with postpartum breast tenderness, 50% of patients colonized *S. aureus* in their breast milk. Interestingly, both those patients who cultured positive for *S. aureus* and those who cultured negative improved at the same rate on oral antibiotics, with 94% of women experiencing pain resolution. The only difference in symptoms between these two groups was that the mothers who cultured negative were significantly more likely to experience breast pain on deep palpation. In addition to oral antibiotics, 40% of all patients received antifungal therapy. Ultimately, because all patients improved with antibiotic use regardless of whether they colonized *S. aureus*, it appears that the anti-inflammatory properties of the antibiotics may have also played a role in improving the symptoms of these nursing mothers, just as in the case of acne patients where dermatologists often prescribe an antibiotic for its antimicrobial and anti-inflammatory effects.³⁸

Herpes simplex virus

Herpes simplex virus infection of the nipple tends to present as miniature vesicles on an erythematous base and can be exquisitely tender. An infant (<3 months old) feeding on a nipple with HSV can develop a life-threatening infection involving the CNS that will require intravenous acyclovir. HSV can mimic more common causes of nipple dermatitis, such as plugged lactiferous ducts, *Candida* mastitis, and bacterial mastitis. Therefore, it is crucial to confirm the diagnosis of HSV, when clinically indicated, with a viral culture, serology, direct immunofluorescence assay, polymerase chain reaction, or Tzanck smear (Fig. 5).



Figure 5 HSV infection in a breastfeeding patient

Raynaud's phenomenon of the nipple

Often, despite a dermatologist's best effort to treat the underlying inflammatory dermatosis and clear the yeast or bacterial or viral infection, nursing mothers will continue to experience chronic pain when breastfeeding. Over the years, this has been given the elusive label "chronic candidal mastitis", even though cultures do not detect *C. albicans*, and there are no signs or symptoms of *Candida* infection in either the mother or infant.

There are likely two main contributing factors of "chronic candidal mastitis". Given that improper techniques for culturing *Candida* species existed prior to 2003, it is likely that some of these patients may, in fact, have had a yeast infection. However, this does not explain those patients who continue to experience nipple pain despite oral and topical antifungal therapy.

Another possible contributing factor in patients given the label of "chronic candidal mastitis" is Raynaud's phenomenon of the nipple, described as vasospasm of the arterioles causing intermittent ischemia (Fig. 6). Raynaud's should be considered in the differential if a nursing mother is experiencing nipple pain for over four weeks and has failed multiple rounds of antifungal and antibiotic therapies. Raynaud's is thought to be quite common in the hands, affecting up to 20% of women of childbearing age.³⁹ Although there are only a few reported cases on Raynaud's phenomenon of the nipple among nursing mothers, the largest series being a cohort of 12 patients,³⁹ it is generally thought to be missed by dermatologists and underdiagnosed.

Work-up for nipple dermatitis

This section reviews the proper technique to perform cultures of the infant's mouth as well as the mother's skin



Figure 6 Raynaud's phenomenon of the nipple. Note the blanching of the nipple with cold exposure

and breast milk. This is followed by a discussion on relevant questions to ask a nursing mother when working up nipple dermatitis.

Culture techniques

To perform a fungal culture of the infant's mouth, simply swab obvious lesions if present. If, however, the infant's mouth appears free of lesions, swab the tongue, buccal mucosa, and palate. Do not soak the swab in the infant's saliva, as saliva has antifungal peptides. Before sending any fungal culture for processing, be sure to moisten the swab sufficiently with normal saline. This will help ensure that yeasts survive. Finally, make sure that the fungal culture is processed within 24 hours.^{40,41}

When performing either a bacterial or fungal culture of the mother's skin, first lightly moisten the swab with saline before swabbing the skin to increase the yield of microorganisms. Swab both the skin of the nipple and areola as well as around the breast in the intramammary folds. Always perform bacterial cultures first, then clean the area with 60% ethanol avoiding any areas of skin breakdown. This will help reduce bacterial contamination for the fungal culture. After performing the fungal culture, moisten the swab sufficiently with normal saline and process it within 24 hours.^{40,41}

Culturing breast milk for fungal infections has long been considered futile because the presence of immunoglobulins and lactoferrin in breast milk can inhibit the growth of *C. albicans*.⁴²⁻⁴⁴ The addition of iron to the breast milk helps overcome the inhibition of *C. albicans* growth by lactoferrin,³⁰ but there are presently no commercially available fungal cultures that utilize this technique. Recently, however, several new methods of diagnosing *Candida* growth have become available. One approach

Culture technique

- **Infant's mouth**
 - **Fungal culture:** Swab the tongue, buccal mucosa, and palate. Do not soak the swab in saliva. Moisten with saline before sending for processing. Process within 24 hours.
- **Mother's skin** (including the nipple and mammary folds)
 - 1. For bacterial & fungal cultures, moisten swab lightly with saline
 - 2. Perform bacterial culture first.
 - 3. Then, clean skin with 60% ethanol to reduce bacterial contamination.
 - 4. Finally, perform fungal culture. Moisten with saline before send for processing. Process within 24 hours
- **Mother's breast milk**
 - **Fungal culture:** Special processing with iron to overcome effect of lactoferrin in milk is not commercially available. Recently developed methods of identifying *Candida* species include the detection of (1→3)-β-D-glucan in either plasma or breast milk and the use of new growth medium CHROMagar™ *Candida*.
 - **Bacterial culture:** Hand-express milk. Discard first 1-m.

Figure 7 Proper technique to perform cultures of the infant's mouth, as well as the mother's skin and breast milk

measures the presence of $(1 \rightarrow 3)\text{-}\beta\text{-D-glucan}$ in either plasma or breast milk. Because $(1 \rightarrow 3)\text{-}\beta\text{-D-glucan}$ makes up 40% of the cell wall of *C. albicans*, its detection would confirm the growth of *Candida* species. Another approach uses a new growth medium, CHROMAgar™ *Candida* (CHROMAgar Microbiology, Paris, France), which selectively promotes the growth and detection of *Candida* species because of the presence of a chromogenic agent (Fig. 7).⁴⁵

Detection of bacteria in breast milk is much more straightforward. Simply instruct the mother to hand express her breast milk, making sure to discard the first 1 ml in order to prevent potential bacterial contaminants found on the skin.

Ultimately, it is important to remember to be as comprehensive as possible. Do perform multiple cultures and send for sensitivities, as the more cultures and sensitivities

Date of Appointment _____

Questionnaire For Nursing Mothers

Demographic Information

1. Name of patient (mother) _____
2. Name of baby _____
3. Baby's date of birth _____
4. Baby's birth weight _____
5. Current age of baby _____
6. Current weight of baby _____
7. Is this your first child? _____
 - a. If not, how many other children do you have? _____
 - b. Did you breastfeed your other children? _____

Delivery Information

8. Type of Delivery _____ Cesarean _____ Vaginal _____
9. After how many weeks of pregnancy did you deliver? _____
10. Did any unusual events occur around the time of delivery? If yes, please explain. _____

11. Were any antibiotics or other medications given to YOU around the time of delivery, or after delivery? If yes, please explain why, which medications were given, and for how long. _____

12. Were any antibiotics or other medications given to the BABY soon after delivery? If yes, please explain why, which medications were given, and for how long. _____

Nursing Information

13. How soon after delivery did you begin breastfeeding? _____
14. How many days after delivery did your milk come in? Day # _____
15. Do you breastfeed, pump, or both? _____
16. How often do you breastfeed or pump? _____
17. Where do you breastfeed? _____
18. Do you use a nursing pillow? _____
19. How long does the baby nurse on each breast? _____
20. How often does the baby fall asleep during breastfeeding? _____
21. Do you ever skip any feedings during the day or night? _____
22. When does the baby go to bed? _____
23. When does the baby wake up? _____
24. Do you breastfeed when the baby wakes up? _____
25. Does the baby receive any formula? If yes, please explain when and how much. _____

26. Does the baby drink from a bottle? If yes, please indicate when. _____

Figure 8 Sample questionnaire for nursing mothers to complete at the time of initial evaluation

Mother's Situation

27. What difficulty are you experiencing? _____

28. When did it begin? _____
29. What treatments have you tried thus far? _____

30. Do you currently have any flu-like symptoms (such as fever, chills, runny nose, sore throat, headache, nausea, etc.)? If yes, please explain. _____

31. Do you have history of eczema, psoriasis, allergies to fragrances, lanolin, or soaps, and/or other skin conditions? If yes, please explain. _____

32. Do you have Raynaud's phenomenon? Symptoms may include change in color (white, blue, or red) of hands or feet with cold exposure. _____
33. Do you enjoy cold weather sports, such as skiing or ice-skating? _____
34. Do you have any current medical problems (such as, diabetes, high blood pressure, etc.)? If yes, please explain. _____
35. Are you currently taking any INTERNAL medications? If yes, please explain. _____

36. Are you currently using any TOPICAL medications? If yes, please explain. _____

Baby's Situation

37. Has the baby received any treatments? If yes, please explain. _____

38. Has the baby ever had a diaper rash? _____
39. Has the baby ever had a white coating in the mouth on the gums or on the tongue? _____

40. Has the baby ever had "colicky" symptoms, excessive burping, been very "gassy", spit up greater than 1-2 teaspoons at a time, and/or been inconsolable? If yes, please explain. _____

Laundry and Clothing

41. Which laundry detergent do you use for your CLOTHES? _____
42. Which laundry detergent do you use for your BRAS? _____
43. Do your bras have 100% cotton cups? _____
44. What kind of nursing pads do you use? _____ Disposable _____ Washable
45. Do you wear a bra at night? _____

Figure 8 (Continued)

that are performed, the more likely the infectious organisms will be detected.

Clinical evaluation

So, what are the key elements of the patient history that should be obtained from a nursing mother with nipple dermatitis? First, determine if the nursing mother has seen a lactation consultant to verify that infant latch-on and chronic trauma to the nipple is not the source of the problem. If the patient has not seen a licensed lactation consultant, evaluate the infant for appropriate latch-on

and positioning and for any suckling disorders due to congenital oral anomalies. A referral to a lactation consultant can be tremendously helpful, as they have many years of experience mastering the art of lactation and can provide the nursing mother with many subtle tricks to limit pain and trauma to the nipple.

Inquire about personal history of atopic dermatitis or psoriasis to assess if this could represent a flare of eczematous dermatitis or koebnerization of psoriasis, respectively. Check all detergents, soaps, and topical substances that the nursing mother applies to the breast to rule out an irritant or allergic contact dermatitis.

To evaluate for Raynaud's phenomenon of the nipple, determine if the mother experiences cold sensitivity particularly in winter months, vasoconstriction of the hands and feet with cold exposure, or any changes in color of the nipple. Ask about risk factors for *Candida* infection, such as recent use of antibiotics or a history of gestational diabetes, which can persist postpartum. Examine the infant for oral thrush and diaper rash. Finally, ask about any recent fevers or chills, which may be suggestive of a possible bacterial infection (Figs. 8 and 9).

Management of nipple dermatitis

When a breastfeeding mother presents with sore nipples, dermatologists should first and foremost manage pain. Advise the mother to make nursing intervals every 3–4 hours. Breastfeed for 10–12 minutes first on the less tender breast, then alternate to the other breast, and then go back to the less tender breast if necessary. Reassure the mother that not only is it safe, but it is recommended that she continue to breastfeed on the tender breast even if the culture is positive for yeast or bacteria. Instead of

Patient's Name _____
 Date of Appointment _____

Physician's Note for Nursing Mothers

Patient History
 Chief Complaint: _____
 Allergies: _____
 Medications: _____
 Past Medical History: _____
 Past Surgical History: _____
 Family History: _____
 Social History: Tobacco: _____ Alcohol: _____ Illicit Drugs: _____ Occupation: _____
 Single: _____ Married: _____ Divorced: _____ No. of Children: _____

Physical Examination
 Vital Signs: Pulse: _____ Blood Pressure: _____/_____ Respiratory Rate: _____ Temperature: _____°F/C
 General appearance: _____ Mood: _____
 Interaction with baby: _____
 Breast: _____
 _____ Engorged? _____ Furrows?
 _____ Erythema of areola? _____ Focal erythema (not including areola)?
 _____ mild _____ moderate _____ severe _____ mild _____ moderate _____ severe
 _____ Erosions? _____ Focal tenderness?
 _____ Desquamation? _____ Fluctuance?
 _____ Vesicles? _____ Plugged ducts?
 Scalp: _____
 Nails: _____
 Evidence of atopic dermatitis: _____ Evidence of psoriasis: _____
 Additional skin findings: _____

Examination of Baby
 Oropharynx: _____
 Genitalia and inguinal folds: _____

Clothing (Check all that apply)
 _____ Cotton bra cup _____ Disposable nursing pads
 _____ Appropriate fit of bra _____ Cotton nursing pads

Nursing Observation (Check all that apply)
 _____ Appropriate positioning _____ Uses a nursing pillow
 _____ Able to latch-on _____ Adequate breast support

Figure 9 Sample physician consultation note to evaluate a breastfeeding mother with nipple dermatitis

Patient's Name _____

Date of Appointment _____

Laboratory Procedures (Check all that apply)

_____ KOH
 _____ Fungal culture: _____ Infant _____ Mother _____ Breast milk
 _____ Bacterial culture: _____ Infant _____ Mother _____ Breast milk

Differential Diagnosis (Check all that apply)

_____ Infection: _____ Yeast (*C. albicans*) _____ Bacterial (*S. aureus*) _____ Viral (HSV)
 _____ Dermatitis: _____ Atopic _____ Irritant _____ Contact
 _____ Psoriasis
 _____ Areola Trauma
 _____ Plugged Duct/Galactocele
 _____ Raynaud's phenomenon of the nipple

Treatment Recommendations (Check all that apply)**General instructions:**

_____ Make nursing intervals Q3-4 hours minimum if possible. Breastfeed for 10-12 minutes first on less tender breast, then alternate to other breast.
 _____ Pump 2-4 times daily, instead of breastfeeding for pain relief. Return to breastfeeding as tolerated.
 _____ Ibuprofen: Take 400 mg PO Q4 hours (max dose of 2400 mg/day) PRN pain
 _____ Wash with soap-free cleansers, such as Cetaphil®, Cerave®, or Aquanil®.
 _____ Apply Aquaphor® ointment BID-TID, over the top of the prescription corticosteroid if prescribed, and QHS.
 _____ Return for re-evaluation 7-10 days

Atopic Dermatitis patients, general instructions plus

_____ Apply hydrogel pads, such as Soothies® by Lansinoh® or Ameda ComfortGel™, after nursing PRN pain. Replace hydrogel pads every 3 days and clean after each use with soap and water
 _____ Apply low-to mid-strength topical corticosteroids, such as desonide ointment, hydrocortisone butyrate cream, or alcometasone dipropionate cream, BID x 10-14 days after nursing.

Candidiasis patients, general instructions plus

_____ Gentian violet (less than 0.5% concentrated solution): Swab infant's mouth QDay x 3-7 days, or
 Nystatin Suspension: Swab infant's mouth TID x 7-10 days after nursing
 _____ Fluconazole standard course: Take 400 mg PO on day #1, then 100 mg PO BID x 13 days

Mastitis patients

_____ Oral antibiotic: Take cephalexin 500 mg BID-TID, amoxicillin 500 mg BID-TID, or dicloxacillin 250 mg TID PO x at least 2 weeks (preferably 4-6 weeks) for mastitis, may need prophylactic fluconazole of 300 mg PO Q 3 days during course

Raynaud's patients

_____ Nifedipine sustained release: Take 30 mg PO QHS x 14 days as minimum trial for Raynaud's.
 _____ Wear warm clothing, and take 2 hot showers a day prior to nursing.

Figure 9 (Continued)

breastfeeding, pumping 2-4 times daily can also be helpful for pain relief. But, mothers should be advised to return to breastfeeding as tolerated. Warm water compresses have been shown to be effective in treating sore nipples and superior in reducing pain compared with the use of lanolin or dried breast milk.⁴⁶ Hydrogel pads (Soothies® by Lansinoh® or ComfortGel™ by Ameda®) can also provide immediate pain relief when applied to the nipple after each feeding. Hydrogel pads should be replaced at least every three days and cleaned after each use with soap and water.

Ibuprofen 400 mg every four hours (maximum dose of 2400 mg/d) can also be used as needed for pain.

To manage nipple soreness due to poor infant latch-on, one technique is to position the nipple asymmetrically in the center of the top half of the infant's mouth, instead of in the middle of the infant's mouth. With this technique, more of the nipple areola will be seen at the infant's nose than at the chin because the infant will suckle the milk from the breast under the nipple into the mouth. This allows the nipple to better expand in the

space between the tongue and the roof of the mouth.^{12,13} It can also be helpful to position the infant's body to directly face the mother, with ears, shoulders, and hips in alignment.¹⁰ In terms of cases of nipple pain secondary to congenital oral anomalies, surgical correction is generally considered the most effective method of improving infant latch-on, increasing milk transfer and decreasing maternal pain.¹⁴

Plugged lactiferous ducts are usually treated with warm compresses or sterile needle aspiration. Massaging the affected area in the direction of the nipple can be helpful. Larger galactoceles may need to be surgically removed to prevent secondary infection. Nursing mothers should be advised to avoid tight fitting bras and encouraged to breastfeed frequently. If the mother is pumping and continues to have recurrent milk blisters, recommend using the lowest possible settings on the pump suction and be sure to verify that the breast shield is appropriately sized.

If the patient demonstrates an eczematous component to the nipple dermatitis, prescribe a low- or medium-strength cortisone ointment twice a day for two weeks. Category V or VI potency topical corticosteroids, such as desonide ointment, hydrocortisone butyrate cream (Locoid Lipocream®), or alcometasone dipropionate cream (Aclovate®) can be recommended.

If an infection is clinically suspected, begin by asking the mother to place all pacifiers, nipples, and breast pump shields in the dishwasher, in addition to any parts of a breast pump that come in contact with breast milk. Linens and bras should be washed daily in hot water with one cup distilled vinegar.

Additionally, over-the-counter gentian violet is an excellent choice as it can treat both bacteria and yeast infections. It is particularly effective in treating *Candida* infection of the mother and the infant. Gentian violet (concentrated solution of <0.5%) should be applied to the infant's mouth once a day for 3–4 days but for no more than 7 days. Gentian violet can cause buccal ulceration and necrotic skin reactions if used at higher concentrations and for extended periods of time but is considered safe at a concentrated solution of <0.5% and when applied once daily, use for <7 days.^{47,48} Instruct the mother to dip a cotton-tipped applicator into the gentian violet and allow the infant to suck on the tip of the cotton swab. If the inside of the infant's mouth does not completely turn purple, then the mother should paint the sides of the mouth with the swab. After applying the gentian violet in the infant's mouth, the infant should then feed. Both nipples should turn purple at the end of the feed. If this does not occur, the mother should apply the gentian violet directly to the breast. Mothers should be aware that this treatment can be

messy and can stain clothing and linens. Gentian violet will turn the infant's mouth purple, but this purple color will disappear after a few days.

An alternative therapy to gentian violet for treating the infant's oral thrush is to swab 1 ml nystatin suspension in the infant's mouth after each feeding for 7–10 days. Reassure the mother that nystatin is not absorbed in the gastrointestinal tract, so it will not put her infant at risk. As for treating the *Candida* infection on the mother's nipple, clotrimazole 0.1% cream can be applied twice a day for two weeks. For a possible bacterial infection of the nipple, mupirocin 2% ointment can be applied twice a day for two weeks.

If topical therapies are ineffective, then consider prescribing systemic medications. When a yeast infection is clinically suspected, oral fluconazole should be prescribed at a 400 mg one-time dose, then 100 mg twice a day for at least two weeks or until pain resolves. For bacterial infection, oral antibiotics such as cephalexin 1000–1500 mg/d, amoxicillin 1000–1500 mg/d, or dicloxacillin 750 mg/d should be used for at least two weeks, preferably 4–6 weeks. If the patient does not improve approximately 48 hours after starting oral antibiotics, consider the possibility of an abscess development, given that 5–10% of patients with mastitis will go on to develop an abscess.²⁸ Order an ultrasound and obtain a surgical consultation, as the patient may need repeated aspirations, which are generally less painful and mutilating than Incision & Drainage and result in less functional impairment.

Finally, if the patient fails oral antibiotics and antifungals or there is any history of cold intolerance, consider Raynaud's phenomenon of the nipple. Patients with chronic breast pain, if properly diagnosed with Raynaud's, can improve dramatically if they are advised to avoid exposure to cold temperature, use techniques to keep the breasts and nipples warm, and avoid vasoconstrictive drugs that may precipitate symptoms. Nifedipine, approved by the American Academy of Pediatrics for use in nursing mothers, is a safe and effective medication that can significantly improve symptoms of Raynaud's.⁴⁹ Nifedipine is transferred to breast milk in low levels, amounting to <5% of the maternal dose.^{47,48} The recommended dose of nifedipine, sustained release formulation, is 30 mg/d. Most women can establish increased vascularization with a two-week course of the medication, but some may require therapy until breastfeeding is discontinued. Common side effects include headache, dizziness, hypotension, and tachycardia.⁵⁰

In sum, there are many useful approaches to treat nipple dermatitis among nursing mothers. Because the etiology of painful nipple dermatitis is often multifactorial, therapeutic management should address all possible contributing factors (Fig. 10).

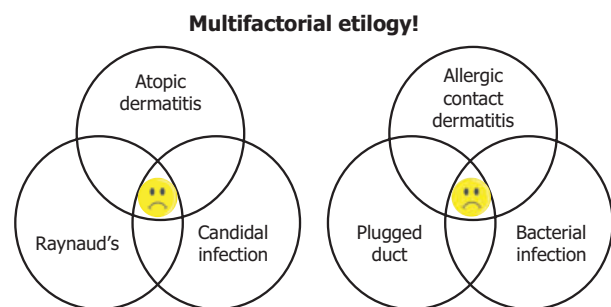


Figure 10 These Venn diagrams illustrate the concept that nipple dermatitis can result from one or many possible causes. This example illustrates that one patient may present with flare of atopic dermatitis, superinfected with *Candida* infection and Raynaud's phenomenon of the nipple; whereas another patient may present with allergic contact dermatitis, superinfected with *S. aureus* colonization and plugged lactiferous ducts. These diagrams are a useful counseling tool to help patients understand why they may need to use a combination of multiple topical and oral therapies

Conclusion

Nursing mothers with nipple pain and associated nipple dermatitis will often present to a variety of medical specialists, including dermatologists, pediatricians, obstetricians, and primary care doctors. Dermatologists can really play a unique role in the care of these patients. While other specialists care for patients of a specific age group, dermatologists are comfortable treating both adults and children. Dermatologists are, therefore, able to evaluate and culture both the mother and the infant. In addition, dermatologists are much more accustomed to managing complex eczematous conditions. Thus, dermatologists are truly in the best position to effectively diagnose, manage, and treat nipple dermatitis among nursing mothers and, in so doing, help prevent early termination of breastfeeding.

Questions

- What is the most commonly reported reason among nursing mothers for early discontinuation of breastfeeding?
 - Painful nipples
 - Too little breast milk
 - Engorgement of breasts
 - Fussy baby
- What can cause painful nipple dermatitis among nursing mothers?
 - Problems with infant latch-on and positioning
 - Plugged lactiferous ducts
 - Ecematous conditions
 - Yeast, bacterial or viral infections
 - Raynaud's phenomenon of the nipple
 - All of the above
- According to the recommendation of the World Health Organization, for how long should infants be exclusively breastfed?
 - 3 months
 - 6 months
 - 9 months
 - 12 months
- According to the recommendations of the World Health Organization, for how long should infants be breastfed along with complementary foods?
 - 6 months
 - 12 months
 - 18 months
 - 24 months
- Approximately what percentage of nursing mothers experiencing deep breast or nipple pain will culture positive for *S. aureus*?
 - 10%
 - 25%
 - 50%
 - 90%
- Raynaud's phenomenon of the nipple can be a potential contributing factor in patients given the label of "chronic candidal mastitis".
 - True
 - False
- Which of the following procedures should be performed when performing a fungal culture of the infant's mouth?
 - Swab the infant's tongue, buccal mucosa and palate
 - Send fungal culture for processing after 72 h
 - Soak the swab in the infant's saliva
 - Verify the swab is dry for processing
- Which of the following is NOT a common side effect of nifedipine?
 - Hypotension
 - Bradycardia
 - Dizziness
 - Headache
- Which of the following is considered appropriate with regard to use of Gentian violet?
 - Use for more than 10 d
 - Use for 3–4 d
 - Use in combination with nystatin
 - Use a concentrated solution of 2%

10. Why are dermatologists in the best position to effectively diagnose, manage, and treat painful nipple dermatitis?
 - a. Dermatologists are comfortable treating both adults and children
 - b. Dermatologists can evaluate and culture both the mother and infant
 - c. Dermatologists are accustomed to managing eczematous conditions
 - d. All of the above

References

- 1 World Health Organization. Health topics: breastfeeding 2011. <http://www.who.int/topics/breastfeeding/en/> [Accessed June 19, 2011].
- 2 World Health Organization. Nutrition: infant and young child feeding data by country 2011. <http://www.who.int/nutrition/databases/infantfeeding/countries/en/index.html> [Accessed June 19, 2011].
- 3 The Surgeon General's Call to Action to Support Breastfeeding 2011. <http://www.surgeongeneral.gov/topics/breastfeeding/calltoactiontosupportbreastfeeding.pdf> [Accessed June 19, 2011].
- 4 Center for Disease Control and Prevention. *Breastfeeding Report Card – United States*, 2010. <http://www.cdc.gov/breastfeeding/pdf/BreastfeedingReportCard2010.pdf> [Accessed June 19, 2011].
- 5 Morland-Schultz K, Hill PD. Prevention of and therapies for nipple pain: a systematic review. *J Obstet Gynecol Neonatal Nurs* 2005; 34: 428–437.
- 6 Newton N. Nipple pain and nipple damage; problems in the management of breast feeding. *J Pediatr* 1952; 41: 411–423.
- 7 Ziemer MM, Paone JP, Schupay J, et al. Methods to prevent and manage nipple pain in breastfeeding women. *West J Nurs Res* 1990; 12: 732–743; discussion 43–44.
- 8 Ziemer MM, Pigeon JG. Skin changes and pain in the nipple during the 1st week of lactation. *J Obstet Gynecol Neonatal Nurs* 1993; 22: 247–256.
- 9 Barankin B, Gross MS. Nipple and areolar eczema in the breastfeeding woman. *J Cutan Med Surg* 2004; 8: 126–130.
- 10 Tait P. Nipple pain in breastfeeding women: causes, treatment, and prevention strategies. *J Midwifery Womens Health* 2000; 45: 212–215.
- 11 Spencer JP. Management of mastitis in breastfeeding women. *Am Fam Physician* 2008; 78: 727–731.
- 12 Cadwell K. Latching-on and suckling of the healthy term neonate: breastfeeding assessment. *J Midwifery Womens Health* 2007; 52: 638–642.
- 13 Page D. Breastfeeding: learning the dance of latching. *J Hum Lact* 2007; 23: 111–112.
- 14 Geddes DT, Langton DB, Gollow I, et al. Frenulotomy for breastfeeding infants with ankyloglossia: effect on milk removal and sucking mechanism as imaged by ultrasound. *Pediatrics* 2008; 122: e188–e194.
- 15 Amir L. Eczema of the nipple and breast: a case report. *J Hum Lact* 1993; 9: 173–175.
- 16 Frosch PJ, Pilz B, Andersen KE, et al. Patch testing with fragrances: results of a multicenter study of the European Environmental and Contact Dermatitis Research Group with 48 frequently used constituents of perfumes. *Contact Dermatitis* 1995; 33: 333–342.
- 17 Nettis E, Colanardi MC, Soccio AL, et al. Occupational irritant and allergic contact dermatitis among healthcare workers. *Contact Dermatitis* 2002; 46: 101–107.
- 18 Tupker RA, Bunte EE, Fidler V, et al. Irritancy ranking of anionic detergents using one-time occlusive, repeated occlusive and repeated open tests. *Contact Dermatitis* 1999; 40: 316–322.
- 19 McGeorge BC, Steele MC. Allergic contact dermatitis of the nipple from Roman chamomile ointment. *Contact Dermatitis* 1991; 24: 139–140.
- 20 Flyvholm MA. Contact allergens in registered cleaning agents for industrial and household use. *Br J Ind Med* 1993; 50: 1043–1050.
- 21 Giordano-Labadie F, Schwarze HP, Bazex J. Allergic contact dermatitis from camomile used in phytotherapy. *Contact Dermatitis* 2000; 42: 247.
- 22 Bossuyt L, Doooms-Gossens A. Contact sensitivity to nettles and camomile in 'alternative' remedies. *Contact Dermatitis* 1994; 31: 131–132.
- 23 Morrow DM, Rapaport MJ, Strick RA. Hypersensitivity to aloe. *Arch Dermatol* 1980; 116: 1064–1065.
- 24 Buckley DA, Wakelin SH, Seed PT, et al. The frequency of fragrance allergy in a patch-test population over a 17-year period. *Br J Dermatol* 2000; 142: 279–283.
- 25 Wolf R. The lanolin paradox. *Dermatology* 1996; 192: 198–202.
- 26 Kinlay JR, O'Connell DL, Kinlay S. Risk factors for mastitis in breastfeeding women: results of a prospective cohort study. *Aust N Z J Public Health* 2001; 25: 115–120.
- 27 Brook I. Infant botulism. *J Perinatol* 2007; 27: 175–180.
- 28 Kinlay JR, O'Connell DL, Kinlay S. Incidence of mastitis in breastfeeding women during the six months after delivery: a prospective cohort study. *Med J Aust* 1998; 169: 310–312.
- 29 Brent NB. Thrush in the breastfeeding dyad: results of a survey on diagnosis and treatment. *Clin Pediatr (Phila)* 2001; 40: 503–506.
- 30 Morrill JF, Pappagianis D, Heinig MJ, et al. Detecting *Candida albicans* in human milk. *J Clin Microbiol* 2003; 41: 475–478.
- 31 Morrill JF, Heinig MJ, Pappagianis D, et al. Risk factors for mammary candidosis among lactating women. *J Obstet Gynecol Neonatal Nurs* 2005; 34: 37–45.
- 32 Jennison RF. Thrush in infancy. *Arch Dis Child* 1977; 52: 747–749.
- 33 Ollila P, Niemela M, Uhari M, et al. Risk factors for colonization of salivary lactobacilli and *Candida* in children. *Acta Odontol Scand* 1997; 55: 9–13.

- 34 Darwazeh AM, al-Bashir A. Oral candidal flora in healthy infants. *J Oral Pathol Med* 1995; 24: 361–364.
- 35 Feigin RD. *Textbook of Pediatric Infectious Diseases*, 5th edn. Philadelphia: Saunders, 2004.
- 36 Livingstone V, Stringer LJ. The treatment of *Staphylococcus aureus* infected sore nipples: a randomized comparative study. *J Hum Lact* 1999; 15: 241–246.
- 37 Amir LH, Garland SM, Dennerstein L, *et al.* *Candida albicans*: is it associated with nipple pain in lactating women? *Gynecol Obstet Invest* 1996; 41: 30–34.
- 38 Eglash A, Plane MB, Mundt M. History, physical and laboratory findings, and clinical outcomes of lactating women treated with antibiotics for chronic breast and/or nipple pain. *J Hum Lact* 2006; 22: 429–433.
- 39 Anderson JE, Held N, Wright K. Raynaud's phenomenon of the nipple: a treatable cause of painful breastfeeding. *Pediatrics* 2004; 113: e360–e364.
- 40 Wiener S. Diagnosis and management of *Candida* of the nipple and breast. *J Midwifery Womens Health* 2006; 51: 125–128.
- 41 Francis-Morrill J, Heinig MJ, Pappagianis D, *et al.* Diagnostic value of signs and symptoms of mammary candidosis among lactating women. *J Hum Lact* 2004; 20: 288–295; quiz 96–99.
- 42 Viejo-Diaz M, Andres MT, Fierro JF. Different anti-*Candida* activities of two human lactoferrin-derived peptides, Lfpep and kaliocin-1. *Antimicrob Agents Chemother* 2005; 49: 2583–2588.
- 43 Soukka T, Tenovuo J, Lenander-Lumikari M. Fungicidal effect of human lactoferrin against *Candida albicans*. *FEMS Microbiol Lett* 1992; 69: 223–228.
- 44 Montagne P, Cuilliere ML, Mole C, *et al.* Changes in lactoferrin and lysozyme levels in human milk during the first twelve weeks of lactation. *Adv Exp Med Biol* 2001; 501: 241–247.
- 45 Hale TW, Bateman TL, Finkelman MA, *et al.* The absence of *Candida albicans* in milk samples of women with clinical symptoms of ductal candidiasis. *Breastfeed Med* 2009; 4: 57–61.
- 46 Pugh LC, Buchko BL, Bishop BA, *et al.* A comparison of topical agents to relieve nipple pain and enhance breastfeeding. *Birth* 1996; 23: 88–93.
- 47 Hale T. *Medications and Mothers' Milk*, 14th edn. Amarillo, TX: Hale Pub., L.P., 2010: 47.
- 48 Manninen AK, Juhakoski A. Nifedipine concentrations in maternal and umbilical serum, amniotic fluid, breast milk and urine of mothers and offspring. *Int J Clin Pharmacol Res* 1991; 11: 231–236.
- 49 American Academy of Pediatrics Committee on Drugs. Transfer of drugs and other chemicals into human milk. *Pediatrics* 2001; 108: 776–789. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/11533352>.
- 50 Garrison CP. Nipple vasospasms, Raynaud's syndrome, and nifedipine. *J Hum Lact* 2002; 18: 382–385.

Answers

1. a.
2. f.
3. b.
4. d.
5. c.
6. a.
7. a.
8. b.
9. b.
10. d.