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NIPPLE DERMATITIS AS A LOCALIZED MANIFESTATION OF ATOPIC DERMATITIS: A CASE REPORT

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ABSTRACT
Nipple dermatitis is an inflammatory skin condition affecting the areolar and nipple region, most commonly associated with atopic dermatitis (AD). It presents significant diagnostic challenges due to its overlapping features with other conditions such as irritant contact dermatitis, allergic contact dermatitis, Paget's disease, and cutaneous candidiasis . This case report aims to present the diagnostic approach and management of nipple dermatitis in an adolescent patient, highlighting its clinical relevance and differential diagnosis.This case report discusses a 16-year-old female presenting with bilateral nipple dermatitis, initially suspected to have malignancy. Comprehensive evaluation including cytology, ultrasonography, and KOH examination ruled out malignancy and fungal infection. A working diagnosis of nipple dermatitis secondary to atopic dermatitis was established. The patient responded well to topical corticosteroids, emollients, antihistamines, and supportive care. This case highlights the importance of accurate clinical assessment and individualized treatment in managing nipple dermatitis, particularly in adolescents. Early identification and appropriate intervention can prevent chronicity and improve patient quality of life.

Keywords: atopic dermatitis; diagnosis; nipple dermatitis

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INTRODUCTION

Nipple dermatitis is an inflammatory skin condition predominantly affecting the areola and nipple area. It most frequently arises around the areola and may extend to the surrounding breast tissue. This condition has significant implications, particularly for women, impacting cosmetic, sexual, and functional aspects (Reynaert et al., 2023). Nipple dermatitis is frequently considered a minor manifestation of atopic dermatitis (AD); however, it may also indicate other dermatologic or nonspecific conditions, particularly in older or non-atopic individuals (Lee et al., 2025; Reynaert et al., 2023). Nipple eczema (NE) affects 6%–23% of patients with AD, with higher prevalence among adolescents and young adult women, and is often associated with more severe disease and reduced quality of life (Lee et al., 2025). While it most commonly affects adolescent females, nipple dermatitis can occur regardless of prior AD history. Patients with AD have increased susceptibility due to impaired skin barrier function and immune dysregulation (Tamagawa-Mineoka & Katoh, 2020). Triggers may include allergens and irritants that come into direct contact with the skin (Waldman et al., 2019).

Nipple dermatitis can arise from irritant contact dermatitis (ICD) or allergic contact dermatitis (ACD). ICD is typically triggered by soaps, detergents, or friction, while ACD results from allergen exposure such as topical agents or metals. Accurate identification of the cause—especially through patch testing in persistent or bilateral cases—is crucial for effective management (RACGP, 2025; Nature Reviews Disease Primers, 2021; Kim et al., 2014). Clinically, the condition may present acutely with erythematous papules, vesicles, crusts, or erosions, or chronically with dry, scaly,

lichenified skin and underlying erythema or hyperpigmentation, pruritus and pain are hallmark symptoms. (Hayoun-Vigouroux & Misery, 2022; Zengin et al., 2024).

Effective management of atopic dermatitis centers on daily emollient use to strengthen the skin barrier and prevent flares. Bath therapies may help reduce severity. Low- to moderate-potency topical corticosteroids remain first-line, while calcineurin inhibitors are effective alternatives, especially in sensitive areas. Their use during breastfeeding is generally safe with precautions, though long-term data are limited. Secondary infections require appropriate antibiotic treatment based on clinical assessment (Burney et al., 2025; AAD & AAAAI, 2024; StatPearls, 2023; NICE, 2021). This case report aims to present a clinical case of nipple dermatitis in the context of atopic dermatitis, highlighting diagnostic challenges, differential diagnoses, and therapeutic approaches. By documenting this case, we seek to increase awareness among clinicians about the potential complexity of nipple eczema presentations, promote accurate differentiation from other dermatoses or malignancies, and reinforce evidence-based management strategies.

METHOD

This article is a case report study that provides diagnosis, clinical management, and patient follow-up care. Data from this case report were obtained through anamnesis, physical examination, and supporting examinations, and supporting assessments including dermatologic inspection and photographic documentation. conducted at Pandan General Hospital, Medan. This case report discusses a 16-year-old female patient who experienced nipple dermatitis secondary to atopic dermatitis. Information on symptom history, triggers, and treatment response was obtained via structured interviews. The findings were qualitatively analyzed and presented in narrative form to provide clinical insights into diagnosis and topical therapy management.

CASE REPORT

A 16-year-old female patient presented to the Dermatovenereology Clinic at RSUD Pandan, referred from the surgical department with a chief complaint of erythematous patches accompanied by pruritus on both nipples for the past four months. Initially, the patient noticed the appearance of pruritic fluid-filled vesicles on the nipple area, which subsequently ruptured and resulted in ulcerations. Two weeks later, the patient observed that the rash had progressed into erythematous patches with moist erosions and associated pain. She sought treatment at a primary healthcare center; however, due to lack of improvement, she was referred to the hospital's surgical department with a preliminary diagnosis of malignancy.

In the surgical department, the patient was treated with topical medication, and a scraping biopsy was performed. Cytological examination of the smears from both the right and left areolae revealed similar findings, consisting of scattered inflammatory cells, including macrophages and lymphocytes, on a background of cellular debris. No dysplastic epithelial cells or signs of malignancy were observed. The conclusion was a benign smear suggestive of a cyst that need to be correlated clinically. Subsequently, the patient underwent breast ultrasonography (USG), which showed normal subcutaneous structures with no evidence of hypoechoic or isoechoic lesions. The fibroglandular tissues also appeared normal. The overall conclusion from the ultrasonography was that both breasts were within normal limits without any suspicious masses, and the bilateral axillae showed no abnormalities. The patient was then referred to the dermatology department for further evaluation.

The patient was unaware of any personal history of atopic dermatitis (AD), although she frequently complained of dry and itchy skin when sweating. There was no history of tight undergarment use, nail polish application, changes in soap or detergent, or the application of any topical agents to the nipple area in recent months. A family history revealed that the patient's father had a history of allergy and asthma. On physical examination, the patient was in good general condition with

compos mentis consciousness. Vital signs were within normal limits: blood pressure 120/70 mmHg, body temperature 36.8°C, pulse rate 80 beats per minute, respiratory rate 18 breaths per minute, body weight 45 kg, and height 145 cm. No palpable masses were found in either breast. Dermatological examination revealed large, diffuse erythematous plaques with crusting and erosion on the bilateral areolar regions, involving the nipples symmetrically (Figure 1). Based on these clinical findings, the differential diagnoses considered were nipple dermatitis, Paget's disease, and cutaneous candidiasis.

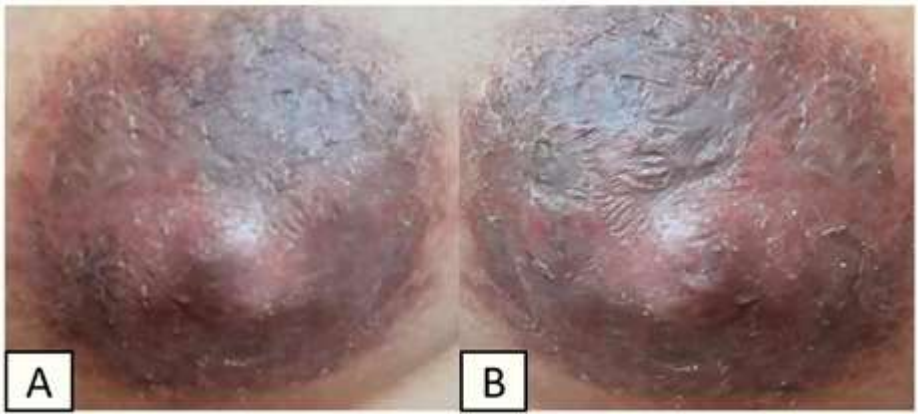

Figure 1. Dermatological examination revealed diffuse erythematous plaques of considerable size, accompanied by crusting and erosion on the right and left areolar regions, with symmetrical involvement of the nipples.

A 10% potassium hydroxide (KOH) examination from skin scrapings showed negative results for hyphae and spores. The patient was advised to undergo serum IgE laboratory testing; however, she declined. A working diagnosis of nipple dermatitis was established. The treatment included oral mefenamic acid 500 mg three times daily, cetirizine 10 mg once daily, topical application of white petrolatum twice daily, gentamicin ointment twice daily, and betamethasone valerate 0.1% cream twice daily. Additionally, the patient was instructed to perform saline compresses using 0.9% NaCl for 15 minutes every 4–6 hours. She was also educated to use hypoallergenic soap, avoid scratching and friction, and refrain from wearing tight-fitting undergarments.

The prognosis was deemed *quo ad vitam* bonam, *quo ad functionam* bonam, and *quo ad sanationam* dubia ad bonam. Three weeks after initiation of therapy, the patient reported significant improvement of the lesions, with no remaining pain or pruritus. Dermatological examination revealed post-inflammatory hyperpigmented macules on the left areolar region (Figure 2). Cetirizine 10 mg was prescribed to be taken only if pruritus recurred, along with continued use of white petrolatum and betamethasone valerate 0.1% cream twice daily. The patient was re-educated to use hypoallergenic soap, avoid scratching and friction, and refrain from wearing tight undergarments.

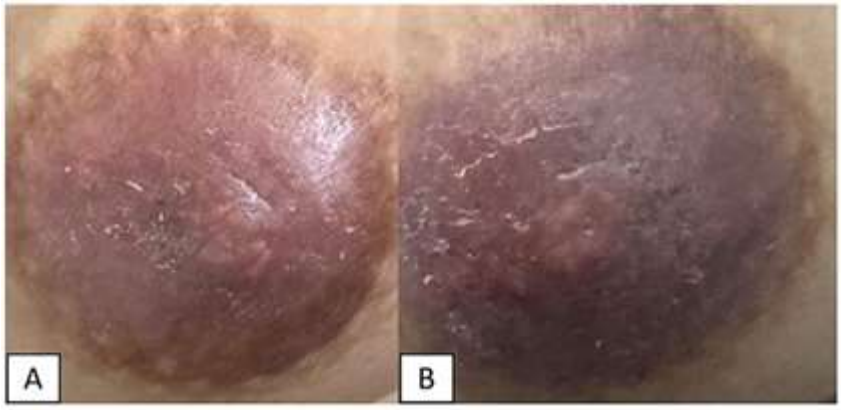

Figure 2. Erythematous and hyperpigmented macules observed on the right and left areolar regions.

DISCUSSION

Nipple dermatitis is the most common manifestation of atopic dermatitis (AD) involving the breast. Historically, Hanifin and Rajka (1980) included nipple dermatitis as one of the minor criteria in the diagnostic criteria for AD (Fishbein et al., 2020). The diagnosis of nipple dermatitis is established based on medical history and clinical manifestations. Nipple dermatitis associated with AD typically presents bilaterally, triggered by specific factors, and is commonly found in patients with a personal or family history of atopy (Reynaert et al., 2023). In contrast, unilateral involvement of the nipple is more often associated with other differential diagnoses such as irritant contact dermatitis, cutaneous infections, or Paget's disease (Jeskey et al., 2024). Additional investigations may be necessary if the diagnosis is uncertain. Patch testing can help identify specific allergens responsible for allergic contact dermatitis (Kim et al., 2014). Mycological examinations, such as KOH preparations and fungal cultures from skin scrapings, are indicated when there is active scaling or maceration, to rule out *tinea* or *Candida* infections of the breast (Novak-Bilić et al., 2018). Bacterial culture of lesion smears may be performed to identify secondary infections unresponsive to therapy. Skin biopsy may be warranted to exclude Paget's disease, especially in older patients with unilateral nipple involvement (Zengin et al., 2024).

In this case, the working diagnosis was nipple dermatitis secondary to atopic dermatitis, with differential diagnoses including Paget's disease and cutaneous candidiasis. Paget's disease of the breast is a rare condition commonly associated with underlying breast carcinoma, particularly ductal carcinoma in situ (DCIS) or invasive carcinoma. It typically affects the nipple–areola complex and presents with symptoms such as erythema, scaling, pruritus, pain, and occasionally discharge or bleeding from the nipple. Histopathologically, it is characterized by the presence of Paget cells—large malignant cells with clear cytoplasm and hyperchromatic nuclei—within the epidermis of the nipple (Zengin et al., 2024). Diagnosis is based on clinical evaluation, histopathological examination, and immunohistochemistry. Management generally involves surgical intervention, with or without adjunctive therapies such as radiation or systemic treatment depending on the extent of breast tissue involvement.

Cutaneous candidiasis is most often caused by *Candida albicans* and typically does not occur in non-lactating women. This condition is more commonly associated with breastfeeding mothers whose infants have a history of oral thrush or diaper dermatitis (Lu et al., 2023). In this case, the patient had undergone a scraping biopsy, which revealed no malignancy. Breast ultrasonography showed no detectable masses, and the 10% KOH examination of skin scrapings was negative for hyphae and spores. These findings effectively ruled out Paget's disease and cutaneous candidiasis. Nipple dermatitis is a multifactorial condition, and treatment should be tailored to the underlying etiology. Routine skin care, including the use of moisturizers, is essential to restore skin barrier function and alleviate pain and pruritus (Eichenfield et al., 2014). In cases of nipple dermatitis associated with atopic dermatitis, the mainstay of treatment is the application of topical corticosteroids twice daily for two weeks. Moderate-potency corticosteroids may be considered in cases with more severe or recalcitrant lesions, while low-potency corticosteroids are appropriate for milder presentations.

The prognosis in this case is *quo ad vitam bonam*, *quo ad functionam bonam*, and *quo ad sanationam dubia ad bonam*. With proper management, nipple dermatitis can resolve effectively. Mild cases can be well controlled with avoidance of irritant soaps, regular use of emollients, and application of topical corticosteroids during flare-ups. However, nipple dermatitis tends to follow a chronic course with varying degrees of recurrence and remission; therefore, identifying and avoiding triggering factors is essential to prevent exacerbations (Reynaert et al., 2023).

CONCLUSION

Nipple dermatitis is an inflammatory skin condition that primarily affects the areolar and nipple area, often associated with atopic dermatitis but may also mimic other dermatological disorders. Accurate diagnosis relies on thorough clinical assessment supported by appropriate investigations to rule out differential diagnoses such as Paget's disease or cutaneous candidiasis. This case highlights the importance of individualized treatment using topical corticosteroids, emollients, and patient education to achieve optimal outcomes. Early recognition and appropriate management are essential to prevent chronicity, improve patient comfort, and maintain quality of life.

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