RESIDENT ROUNDS: PART III

Case Report: Diaper Dermatitis Presenting as Pustules

Ann R. Tucker BA,[a] Ashley N. Emerson MD,[a] Julie P. Wyatt MD,[b] Robert T. Brodell MD[c]

[a]University of Mississippi Medical Center, Jackson, MS
[b]Division of Dermatology, Department of Otolaryngology and Communicative Services, University of Mississippi Medical Center, Jackson, MS
[c]Division of Dermatology, Department of Otolaryngology and Communicative Services, University of Mississippi Medical Center, Jackson, MS and University of Rochester School of Medicine and Dentistry, Rochester, NY

ABSTRACT

Diaper dermatitis is the most common dermatologic disorder of infancy. Its cause can often be determined clinically based on the clinical presentation. Primary diaper dermatitis is associated with irritants and spares the deep skin folds. Secondary diaper dermatitis is most often caused by *Candida* yeast overgrowth and typically presents as a well-defined area of beefy red erythema covering the diaper area and including the deep folds of skin with hallmark satellite pustules. Other causes include seborrheic dermatitis, psoriasis, acrodermatitis enteropathica, allergic contact dermatitis, Langerhans cell histiocytosis, and, in the setting of a primarily pustular eruption, bacterial folliculitis. A simple potassium hydroxide preparation (KOH) can confirm the diagnosis of candida diaper dermatitis and guide proper treatment.

CASE REPORT

A 3-month-old infant presented with a two-week history of worsening "diaper rash." He presented with a primarily pustular eruption involving the lower abdomen, upper thighs, intertriginous zones, and genitalia, with only mild, background erythema without clearly definable borders. Super-absorbent disposable diapers had been used since birth. Zinc oxide paste was utilized with diaper changes for the two weeks since the rash appeared. This failed to produce any improvement. A potassium hydroxide preparation (KOH) from a pustule revealed budding yeast and pseudophyphae. A diagnosis of candida diaper dermatitis was made. Treatment with topical ketoconazole cream twice daily, continued use of super-absorbent diapers, and continued application of zinc oxide paste resulted in a 90% improvement within two weeks.

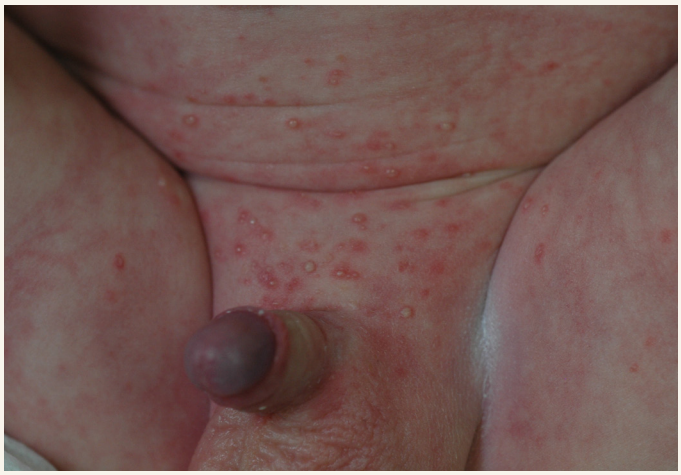
DISCUSSION

Diaper dermatitis is the most common dermatologic disorder of infancy in the United States. More than one million cases are diagnosed each year.[1] A wide variety of factors may contribute to the development of this condition, including exposure to moisture, biochemical irritants, and changes in skin pH associated with exposure to excreta.[2] Primary diaper dermatitis is considered to be a non-allergic dermatitis with the etiology arising from an impaired barrier function of the skin and external irritants[3]; however, *Candida* should be suspected as the causative agent in dermatitis lasting for greater than 3 days.[3,4]

Candidal diaper dermatitis is a clinical diagnosis with a classic presentation including a sharply marginated zone of confluent, beefy red erythema on the upper thighs, lower abdomen, genitals, and unlike irritant diaper dermatitis, it involves the genital creases and skin folds. Satellite pustules are often present and are virtually pathognomonic for this condition.[3] While primarily pustular candidal intertrigo presenting in neonates has been discussed in the literature,[5] this atypical presentation has rarely been reported in infants. Seborrheic dermatitis must also be considered in diaper dermatitis of infancy. This diagnosis is suggested when erythematous, scaly papules and plaques with a yellow greasy scale occur in association with papulosquamous rashing on the scalp, cheeks, chest, and flexural areas. Isolated intertriginous seborrheic dermatitis can be difficult to distinguish clinically from other forms of diaper dermatitis.[6] Since seborrheic dermatitis is associated with the presence of pityrosporon yeast, it often responds to the same topical antifungal treatment as Candidal dermatitis.

A stepwise approach is recommended when a pustular rash is present that is limited to the diaper area. First a KOH should be performed. Most cases with this presentation will demonstrate budding yeast and pseudohyphae, confirming the diagnosis of atypical *Candida* diaper dermatitis.[5] These patients should be treated with an azole topical antifungal cream to attack the Candida yeast, which is the primary pathophysiologic basis for this condition. It is also prudent to use super-absorbent disposable diapers and barrier creams to limit irritation to skin made even more sensitive by barrier damaging effects of this infection. Systemic antifungals are rarely required. Of course, complete clearing of diaper dermatitis is often difficult until children are toilet-trained.

FIGURE 1. Dozens of 0.5 to 1.5 mm diameter pustules are noted, which are limited to the diaper area. Only mild background erythema is noted, without moistness or maceration.



In the setting of a negative KOH and a lack of response to treatment measures, Gram staining or a bacterial culture can easily be performed to exclude bacterial folliculitis. If these measures fail to confirm a diagnosis, the more rare causes of diaper dermatitis should be considered. These include allergic contact dermatitis, psoriasis, Langerhans cell histiocytosis, and acrodermatitis enteropathica.[6] A consideration of family history, a complete dermatologic examination, a biopsy, and serologic testing for zinc levels may be considered in this circumstance.

DISCLOSURES

Robert Brodell declares the following potential conflicts of interest: Speaker's Bureau: Allergan; Galderma; 3M/Graceway Pharmaceuticals; GlaxoSmithKline/Stiefel; Dermik; Novartis Pharmaceuticals Corporation; Sanofi-Aventis; Medicis; PharmaDerm, a division of Nycomed US Inc. Consultant: Galderma Laboratories, LP; Medicis; Dow Pharmaceuticals Sciences; Promius. Advisory Boards: Dow Pharmaceuticals Sciences; Nycomed US Inc. Grant/Research Support; Galderma; Abbott Laboratories; Dow Pharmaceuticals Sciences. Ms. Tucker, Dr. Emerson, and Dr. Wyatt have no conflicts.

REFERENCES

1. Ward DB, Fleischer AB, Feldman SR, Krowchuk DP. Characterization of diaper dermatitis in the United States. *Arch Pediatr Adolesc Med.* 2000; 154:943-946.
2. Adam, R. Skin care of the diaper area. *Pediatr Dermatol.* 2008; 24(4):427-433.
3. Scheinfeld N. Diaper dermatitis a review and brief survey of eruptions of the diaper area. *Am J Clin Dermatol.* 2005; 6(5):273-281.
4. Gupta AK, Skinner AR. Management of diaper dermatitis. *Int J Dermatol.* 2004; 43:830-834.
5. Nanda S, Reddy BS, Ramji S, Pandhi D. Analytical study of pustular eruptions in neonates. *Pediatri Dermatol.* 2002; 19(3):210-215.
6. Ravanfar P, Wallace J, Pace N. Diaper dermatitis: a review and update. *Curr Opin Pediatr.* 2012; 24:1-8.

AUTHOR CORRESPONDENCE

Robert T. Brodell MD
E-mail:..... rbrodell@umc.edu