

# Denouement and Discussion

## Congenital Cutaneous Candidiasis

**H**istological examination showed a subcorneal pustule filled with neutrophils and a superficial inflammatory infiltrate in the dermis. A direct potassium hydroxide test, as well as a periodic acid–Schiff stain on the biopsy specimen, showed spores and pseudohyphae. Growth of *Candida albicans* was observed in a Sabouraud culture. Findings of the Gram stain and bacteria culture were negative. Treatment with a topical antifungal (nystatin) was initiated, which caused the skin lesions to disappear in 7 days. After 3 months of follow-up, the patient remained asymptomatic without treatment and the unguinal dystrophy resolved.

Mucocutaneous *Candida* infections are often observed in newborn infants because up to 20% to 25% of pregnant women have vulvovaginitis caused by this yeast.<sup>1</sup> However, few published case reports can be found in the literature on congenital cutaneous candidiasis. It is not known whether such a scarcity of reports reflects underdiagnosis or underreporting of this condition.<sup>2</sup>

Congenital cutaneous candidiasis seems to result from chorioamnionitis acquired by an ascendant route through the intact fetal membrane from the maternal vagina.<sup>1,3,4</sup> Skin lesions are present from birth or appear during the first few hours of life; they consist of a maculopapular eruption that evolves to include vesicles and pustules. Occurrence of palmo-plantar vesicles and pustules, which evolve to desquamation, is often described. Occasionally, unguinal dystrophy appears as a delayed manifestation of the disease,<sup>2,5</sup> as in our patient. Most of the patients show only cutaneous involvement; however, some patients may develop systemic disease with nonspecific signs of sepsis, hepatomegaly, sepsis, or death.<sup>6</sup> If systemic involvement is suspected, thorax irradiation, ophthalmologic examination, and blood, urine, and cerebral spinal fluid cultures are required. Blood culture results may be negative even when systemic involvement actually occurs. Hematogenous dissemination is not frequent but it can occur among premature neonates and infants with risk factors. Prematurity is generally accepted as a factor predisposing to disseminated disease.<sup>2,6,7</sup> Furthermore, some authors have proposed that in infants with congenital candidiasis, disseminated infection or increased risk of disseminated infection should be suspected in the setting of respiratory distress or other laboratory or clinical signs of sepsis; birth weight lower than 1500 g; treatment with broad-spectrum antibiotics; extensive instrumentation-invasive procedures; positive systemic culture results; and evidence of an altered immune response.<sup>6-9</sup>

Differential diagnosis must be done as with other neonatal pustulovesicular conditions.<sup>3</sup> The diagnosis is confirmed by identification of *C albicans* on a direct potassium hydroxide test or positive findings of a culture in Sabouraud medium from a cutaneous pustule. If a diagnosis is still unclear, a biopsy with a periodic acid–Schiff stain could be performed.

Treatment of candidiasis in the neonate requires an effective antifungal agent and, if possible, elimination of all risk factors for ongoing candidemia. In most term infants with congenital cutaneous candidiasis, the disease is limited to the skin, umbilical cord, and placenta.<sup>10</sup> In these pa-

tients, topical antifungal agents are indicated (nystatin or azole formulations), although spontaneous resolution has also been described.<sup>2,6</sup> Amphotericin B (0.5-1 mg/kg/d) is the recommended antifungal agent for the treatment of candidemia and any form of invasive candidiasis in the neonate,<sup>6-9,11,12</sup> although lipid-associated amphotericin B preparations (3-5 mg/kg/d) are preferred in those cases with invasive candidiasis and severe preexisting renal insufficiency. Fluconazole (6-12 mg/kg/d) can be used as alternative therapy to amphotericin B, if the *Candida* species is identified and the susceptibility is shown.<sup>7,10,11</sup> Flucytosine (50-100 mg/kg/d) is used in combination with amphotericin B for central nervous system infection.<sup>7,9,11</sup> There are no controlled clinical trials to provide the optimal length of therapy. The topical antifungal agent must be used until the lesions resolve, and the systemic therapy must be used a minimum of 21 to 28 days.<sup>7,10,11</sup>

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## REFERENCES

1. Chapel TA, Gagliardi C, Nichols W. Congenital cutaneous candidiasis. *J Am Acad Dermatol.* 1982;6(5):926-928.
2. Almeida Santos L, Beceiro J, Hernandez R, et al. Congenital cutaneous candidiasis. *Eur J Pediatr.* 1991;150(5):336-338.
3. Rudolph N, Tariq AA, Reale MR, Goldberg PK, Kozinn PJ. Congenital cutaneous candidiasis. *Arch Dermatol.* 1977;113(8):1101-1103.
4. Hayashi S, Mochizuki T, Watanabe S. Infection of human fetal membranes in vitro with *Candida albicans*. *Mycoses.* 1989;32(3):119-122.
5. Clegg HW, Prose NS, Greenberg DN. Nail dystrophy in congenital cutaneous candidiasis. *Pediatr Dermatol.* 2003;20(4):342-344.
6. Cosgrove BF, Reeves K, Mullins D, Ford MJ, Ramos-Caro FA. Congenital cutaneous candidiasis associated with respiratory distress and elevation of liver function tests. *J Am Acad Dermatol.* 1997;37(5 pt 2):817-823.
7. Adler A, Litmanovitz I, Regev R, Arnon S, Bauer S, Dolfin T. Breakthrough candida infection in a preterm infant with *Candida albicans* infection. *Am J Perinatol.* 2005;22(3):169-171.
8. Johnson DE, Thompson TR, Ferrieri P. Congenital candidiasis. *Am J Dis Child.* 1981;135(3):273-275.
9. Bendel CM. Candidiasis. In: Remington JS, Klein JO, Baker C, Wilson C, eds. *Infectious Diseases of the Fetus and Newborn Infant.* 6th ed. Philadelphia, Pa: Elsevier Saunders; 2006:1107-1128.
10. Ramón Faba P, García Dura E, Muñoz Romero F, Cañabate González C, Delgado Florencio V, Naranjo Sintés R. Candidiasis cutánea congénita: dos casos y revisión de la literatura. *Actas Dermosifiliogr.* 1992;83(3):101-103.
11. Pappas PG, Rex JH, Sobel JD. Guidelines for treatment of candidiasis. *Clin Infect Dis.* 2004;38(2):161-189.
12. Waguespack-LaBiche J, Chen SH, Yen A. Disseminated congenital candidiasis in a premature infant. *Arch Dermatol.* 1999;135(5):510-512.