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Erythematous plaques and papules on a premature infant

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Abstract

A 2240 gram boy was born at 33.2 weeks gestation with nonblanching, deeply erythematous plaques and papules on the back, flanks, and scalp (Figure 1). His mother was GBS positive and on antibiotic suppression for prior cutaneous MRSA and urinary tract infections. Intrapartum intravenous Penicillin G was administered, and the amniotic sac was artificially ruptured 4 hours prior to delivery to facilitate labor. The delivery was uncomplicated without concern for chorioamnionitis, but the patient initially required CPAP for respiratory distress with 1-minute and 5-minute Apgar scores of 7 and 8, respectively. A skin punch biopsy is shown (Figure 2).

1. Based on these findings, what is the most likely diagnosis?

A. Transient neonatal pustular melanosis

Incorrect: Transient neonatal pustular melanosis typically affects term infants of African descent and manifests at birth with single or grouped pustules or vesicles. These affect all areas of the body, lack surrounding erythema, and may rupture with resultant collarettes or hyperpigmented macules that fade within weeks to months.

B. Congenital cutaneous candidiasis

Correct: The histopathologic findings of subcorneal pustules and acanthosis (Figure 2), and pseudohyphae on GMS stain (Figure 3) confirmed the diagnosis of congenital cutaneous candidiasis (CCC), which presents at birth in premature infants with erythematous macules and papules that may transform into pustules, vesicles, or bullae, followed by rapid

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desquamation. A recent study of 21 cases showed dissemination in 2 cases (10%) with one death.¹ While CCC is not always benign, mortality is lower than published for neonatal candidiasis (30–60%);^{1–3} in contrast to CCC, neonatal candidiasis manifests with erythematous scaly patches, plaques, and satellite pustules after the first week of life and often involves the diaper area, tongue, and oral mucosa.

C. Neonatal lupus

Incorrect: Neonatal lupus consists of annular erythematous plaques or arcuate macules with central atrophy and occasional scaling. The scalp and periorbital area are primarily involved and pathology shows interface dermatitis, hyperkeratosis, and a superficial and deep lymphocytic infiltrate.

D. Pustular psoriasis

Incorrect: Pustular psoriasis, though with similar histopathology, has a predilection for intertriginous areas and presents with erythema and superimposed pustules.

E. Impetigo

Incorrect: Neonatal impetigo is characterized by erythematous macules that transform into vesicles or pustules with eventual honey-colored crusting.

2. What is the postulated pathogenesis for this diagnosis?

A. Uterine ascension with direct penetration or rupture of chorioamniotic membranes

Correct: CCC typically is precipitated by chorioamnionitis, though infection may occur with subclinical rupture of membranes prior to delivery. Antibiotic use predisposes to colonization and as many as 35% of pregnant women have candidal vulvovaginitis, but <1% develop chorioamnionitis.⁴

B. Intrapartum transmission via vaginal secretions or blood

Incorrect: Pathogens transmitted intrapartum include Group B *Streptococcus*, HIV, HSV-2, CMV, Hepatitis B, *Chlamydia trachomatis*, and *Neisseria gonorrhoeae*. While *Candida sp.* skin and gut colonization may occur during birth, it typically does not result in neonatal disease.

C. Transplacental transmission

Incorrect: Rubella, toxoplasmosis, and listeriosis are transplacentally transmitted infections, but CCC is not. Notably, neonatal lupus, which is not infectious but can mimic CCC, is caused by transplacental transmission of maternal anti-Ro/SSA (Sjögren syndrome type A antigen) and anti-La/SSB (Sjögren syndrome type B antigen) antibodies.

D. Genetic predisposition

Incorrect: There is no genetic predisposition for CCC, in contrast to psoriasis.

E. Seeding of intrapartum trauma sites

Incorrect: Intrapartum instrument use such as forceps or vacuum delivery does not appear to facilitate CCC. Intrauterine devices, however, are significant risk factors for both CCC and impetigo in low birth-weight infants, whereas scalp electrodes increase risk of neonatal HSV-2.

3. What is the most common first-line treatment for a preterm patient with this diagnosis?

A. Amphotericin B

Correct: Amphotericin B (1 mg/kg per day) is the first-line treatment of CCC in any infants at high risk for dissemination: low-birth weight (< 2500 g), pre-term delivery (< 37 weeks gestation), and term infants with respiratory distress after delivery, signs of sepsis (e.g. leukocytosis, hyperglycemia), positive cultures, or burn-like dermatitis.^{5–6} Fluconazole is an acceptable alternative once meningitis has been excluded and *C. albicans* is confirmed; susceptibility profiles must inform non-amphotericin treatment of other strains.

B. Topical antifungals

Incorrect: In term infants without any clinical signs described above, CCC is typically a benign illness responsive to topical antifungals.⁶ However, a preterm infant as in the case discussed should be treated with systemic antifungals; a reasonable approach is to treat both preterm and full-term infants with systemic antifungals for a 10-day minimum course.¹

C. Dicloxacillin

Incorrect: Systemic or topical antibiotics are not indicated in the treatment of CCC, but are used to treat impetigo.

D. Acitretin

Incorrect: Though acitretin is an effective treatment for pustular psoriasis, it is not helpful in treating CCC. Infantile pustular psoriasis is rare, which limits our knowledge of the safety profile of standard treatments in this population.

E. Hydrocortisone 1% cream

Incorrect: Topical and systemic steroids are not indicated in the treatment of congenital cutaneous candidiasis. Cutaneous findings in neonatal lupus may respond to treatment with a low-potency topical steroid.

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none

Abbreviations

CCC congenital cutaneous candidiasis

GBS	Group B Strep
CPAP	continuous positive airway pressure
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
HIV	human immunodeficiency virus
HSV-2	herpes simplex virus-2
CMV	cytomegalovirus
GMS	Grocott-Gomori's methenamine silver stain

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Figure 1.
Clinical image of newborn presenting with nonblanching, erythematous plaques and papules on the back and flanks.

Figure 2.
Skin punch biopsy demonstrating pustular dermatosis with epidermal neutrophilic infiltrate and fungal hyphae.

Figure 3. A GMS silver stain of the punch biopsy specimen revealing pseudohyphae, consistent with a diagnosis of congenital cutaneous candidiasis

Note: Online submission required submitting both a “Manuscript” and “Images in Dermatology Question(s)” file. Please see “Images in Dermatology Question(s)” file for the manuscript.