CASE REPORT

Congenital candidiasis presenting as septic shock without rash

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Congenital candidiasis is rare and often benign. We report the case of twins born at 32 weeks' gestation with different manifestations of congenital candidiasis. One twin was born well though neutropenic, and died from overwhelming sepsis with septic shock at 22 h. The other twin presented with a delayed onset of rash at 2 days, remained well and survived.

Congenital candidiasis is rare and usually benign. Deaths are typically in babies <1000 g, although there are occasional intra-uterine deaths. We would like to report the case of twins born at 32 weeks' gestation with two very different presentations of congenital candidiasis. Possible antenatal risk factors included maternal broad spectrum antibiotics and amniotic fluid reduction of polyhydramnios.

CASE HISTORY

Maternal history

The mother was a 29 year old woman with a well 13 month old child who had been born at term following an uncomplicated pregnancy. This, her second pregnancy, was a spontaneous mono-chorionic, di-amniotic twin pregnancy referred for tertiary care at 29 weeks of gestation with reduced fetal movements and back pain. Urine culture grew a pure, heavy growth of *Escherichia coli*, which was treated with antibiotics and repeat urine was sterile. Low vaginal swab at 23 weeks' gestation was positive for group B streptococcus and negative at 30 weeks' gestation. Abdominal ultrasound revealed oligohydramnios around the smaller twin and polyhydramnios around the larger twin, which was treated with amniotic fluid reduction 10 days prior to delivery. Antibiotics were given for this procedure. The fetuses remained stable after the intervention, with resolution of the twin-to-twin transfusion syndrome. There was no history of maternal clinical vaginal candidiasis, paronychia or sub-ungual candidiasis. There was no history of intra-uterine contraceptive device or cervical cerclage. Labour occurred spontaneously at 32 weeks' gestation and the twins were delivered by caesarean section.

Perinatal history

Twin I (the presenting twin) had a birth weight of 1694 g (37th percentile), length of 39 cm (10th percentile) and head circumference of 28.5 cm (15th percentile). Apgar scores were 7 and 9 at 1 and 5 min, respectively. Transient hypoglycaemia was treated with intravenous dextrose. She looked well after birth, with minimal respiratory distress, which was treated with continuous positive airways pressure (CPAP) in air. A few minor self-reverting apnoeas were subsequently treated with a loading dose of caffeine.

Twin II weighed 1740 g and was well, did not require any resuscitation and was nursed in air.

Both babies were admitted to the Newborn Intensive Care Unit.

Clinical course of twin I

The initial peripheral total white blood cell count of twin I was $3.4 \times 10^6/l$, with a neutrophil count of $0.45 \times 10^9/l$. She was treated with intravenous penicillin and gentamicin. She looked well until 9 h after birth when she suddenly became pale and poorly perfused. She required full cardiorespiratory support. Her initial mean arterial pressure after insertion of an arterial line was 20–25 mm Hg. Chest radiographs were normal, with no pneumonic changes. Echocardiography was consistent with vaso-dilatory septic shock: high cardiac output with concomitant low arterial blood pressure. A head ultrasound scan was normal. Twin I remained difficult to oxygenate with increasing tissue hypoxia and died 22 h after birth. Blood culture taken from the umbilical arterial line at the time of deterioration (9 h of life) grew *Candida albicans*, although previous peripheral blood cultures taken at 5 h of age were sterile. Routine nursery admission ear swab taken at birth grew profuse *C. albicans*. The urine culture was negative for bacteria and fungi. A post-natal maternal low vaginal swab grew scanty *C. albicans* and the caesarean wound also clinically appeared to have a candidal infection although no scraping for fungal screen was taken. Placental examination revealed no macroscopic evidence of *C. albicans* but did show profuse microscopic candidal chorioamnionitis (fig 1) and funisitis in twin I's cord and scanty candidal infection in twin II's cord. An autopsy on twin I revealed evidence of disseminated fungal infection with *C. albicans* grown in post-mortem cultures of blood, right lung parenchyma, left pleural fluid and liver. Death was attributed to *C. albicans* septicaemia.

Clinical course of twin II

Twin II remained well. Blood and peripheral cultures were taken at the time of twin I's collapse (9 h) and antibiotics were

Figure 1 Histopathology photograph of candidal chorioamnionitis. The arrows point to the fungal elements.

Figure 2 Rash on the trunk of twin II. Parental/guardian informed consent was obtained for publication of this figure.

commenced. At 72 h of age, she developed a florid pustulovesicular and markedly pruritic truncal rash, with diffuse erythroderma in some areas (fig 2). At this point twin I had died with aetiology still unknown. The only positive cultures that became available were of *C albicans* from twin I's ear swab and a scanty growth of *C albicans* from twin II's nose swab. The appearance and pruritic nature of the rash was most consistent with congenital candidiasis (although palms and soles were spared) and intravenous amphotericin B was commenced. Subsequent skin swabs grew *C albicans*. Twin II continued on amphotericin B for a period of 5 days and was continued on topical and oral antifungals for a total of 14 days. She made a complete recovery.

DISCUSSION

Congenital candidal infection can be associated with intrauterine death or death in the immediate newborn period from disseminated disease.¹ The risk is greater the more premature the newborn infant.¹ To our knowledge this is the first report of a newborn infant, born well and without rash, presenting with overwhelming septic shock and neutropenia from congenitally-acquired, ascending candidal infection. Twin I was relatively mature, had no rash and was without signs or symptoms to suggest *C albicans* infection. The presentation with overwhelming clinical sepsis and neutropenia appeared most consistent with bacterial sepsis. There was no evidence of "white dots on the placenta and red dots on the baby", as is classically described with congenital candidiasis.²⁻⁴ The post-mortem examination found no rash or skin lesions on twin I, and no typical macroscopic lesions on the placenta.

Candidal chorioamnionitis has around a 50% chance of a poor outcome, especially if not diagnosed early. Hood *et al*⁴ described 23 cases of candidal chorioamnionitis. Of the 15 survivors, 10 were asymptomatic and five had rash and/or pneumonia. There were eight deaths: three miscarriages, one still-birth, one infant death and three neonatal deaths. In this case series, 18/23 cases had an intra-uterine foreign body (13 with an intra-uterine contraceptive device and five with cervical suture).⁴ In our twins, amniocentesis was performed on the amniotic sac of twin II, not twin I, the newborn infant who died of sepsis. The classical risk factors for early candidal infection are cervical cerclage and intra-uterine contraceptive devices, and not amniocentesis.⁴ Enhanced pathogenicity of *C albicans* is also described in the presence of cerclage and an intrauterine contraceptive device.⁵ It is known also that candidal infection

can arise through intact membranes and ascending infection was the more likely pathogenesis in our cases.¹

In considering how the outcome in twin I could have been avoided, it was difficult to predict the cause of the sepsis and neutropenia. Neonatal neutropenic sepsis is almost always due to overwhelming bacterial infection. Previous reports have found that the most common abnormality on peripheral blood film of a newborn infant with congenital *C albicans* is leukocytosis.⁴ In one case series,⁵ newborn infants who presented with congenital candidiasis were hyperglycaemic, had an extreme leukemoid reaction and skin mottling resembling burns in some areas; all three conditions were absent in our dying twin.

We found only occasional reports of congenital candidiasis without skin involvement.⁶ There is one case report similar to ours by Friebe-Hoffman *et al*,⁶ who reported a di-chorionic, di-amniotic pregnancy that presented with threatened premature labour at 33 weeks' gestation. The labour was successfully delayed by tocolysis and antenatal steroids were given. No antibiotics were given. Sudden intra-uterine death of the presenting twin occurred later the same day, secondary to ascending candidal chorioamnionitis.⁶ Skin lesions were not reported or discussed.

CONCLUSION

C albicans can rarely lead to overwhelming early-onset neutropenic sepsis, similar to bacterial sepsis, in relatively mature newborn infants. Fungal infection should be considered in similar clinical situations, and every attempt made to identify fungal elements on the newborn infant, placenta or mother.

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