

Twin-twin transfusion syndrome in the setting of COVID-19 pneumonia: A case report

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Abstract

OBJECTIVE/PURPOSE: To present a case of Twin-Twin Transfusion Syndrome (TTTS) in the setting of maternal COVID-19 pneumonia, with placental pathology demonstrating a unique interplay between the two conditions.

MATERIALS AND METHODS: A gestational carrier status post in-vitro fertilization (IVF) developed COVID-19 pneumonia, and TTTS was identified. We retrospectively review the patient's hospital course and report unusual placental pathologic findings that were uncovered post-delivery.

RESULTS: A 30-year-old G6P3023 gestational carrier status post IVF with monochorionic-diamniotic twins presented at 23-6/7 weeks for acute hypoxic respiratory failure in the setting of COVID-19 pneumonia. Patient was treated per standard protocols, including empiric coverage of super-imposed bacterial pneumonia. Ultrasound (US) on hospital day #4 demonstrated fetus A with anhydramnios and fetus B with polyhydramnios. Fetus A additionally showed intermittent absent end diastolic flow on doppler studies, consistent with Stage III TTTS. Fetus A subsequently developed terminal bradycardia on fetal heart rate monitoring. Intrauterine fetal demise was diagnosed on bedside US, changing her status to Stage V TTTS. Monitoring of fetus B monitoring was reassuring. Following discharge, prenatal care included serial main cerebral atrial and umbilical artery doppler studies. Growth US showed intermittent absent umbilical arterial end-diastolic flow which subsequently resolved, and fetal growth restriction that persisted for the rest of the pregnancy. At 31 6/7 weeks, patient presented in active labor, and Fetus B was delivered by low transverse cesarean section for recurrent decelerations remote from delivery. The infant remained in neonatal intensive care unit (NICU) for 17 days before being transported to a NICU closer to the biological parents. At this time, he is 6 months of age and meeting milestones based on corrected estimated gestational age. Placental tissue from both fetuses was evaluated by pathology. Grossly, placenta from fetus A showed approximately 90% fibrosis of the placental parenchyma, suggestive of infarctions. Gross examination of placenta from fetus B was red-brown and spongy with intact cotyledons and marbled fibrotic placental parenchyma. Histologically, placenta from fetus A showed diffuse villous collapse and necrosis of the villi that was present in all examined sections; non-infarcted villi appeared sclerotic, with almost no inflammation seen. Placenta from fetus B showed mature appearing villi with extensive extra-villous trophoblastic lesions. Gross and histologic features determined the cause of the fetal demise was diffuse placental infarction.

CONCLUSIONS: We report a case of TTTS in the setting of COVID-19 pneumonia in a gestational carrier with mono-

chorionic twins status post IVF. The gross and histologic findings of the surviving twin demonstrated fairly intact architecture and perfusion with the absence of necrosis characteristic of TTTS. These findings suggest that COVID-19 associated thrombosis of aberrant vessels between the placentas may have prevented exposure of the surviving twin to tissue necrosis mediators. This case of Stage V TTTS demonstrates a potentially protective effect of COVID-19 induced hypercoagulability on the surviving fetus.