Acute renal failure in preterm twins affected by late twin to twin transfusion syndrome (TTTS)

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Objective
Twin to twin transfusion syndrome is considered a major complication of monochorionic twins, typically occurring in 10-15% of pregnancies, between 16 and 26 weeks of gestation, with only 8.7% of the TTTS cases occurring after this gestational age. Although the pathophysiology is still not fully understood, the presence of intertwin placental vascular anastomoses, causes an imbalance in the net flow of blood from one fetus, the donor, to the other, the recipient. TTTS leads to polyuria, heart failure and hydrops in the recipient twin and to oliguria and oligohydramnios in the donor. Intrauterine death, miscarriage, fetal growth restriction, neonatal death, cardiac and renal dysfunction are some of the complications secondary to TTTS. We report a rare case of acute renal failure in preterm twin affected by late twin to twin transfusion syndrome.

Methods
This is a case presentation and literature review.

Results
In our case, a 34'11" weeks male MCDA twins were born by emergency caesarean section due to suspected late onset of acute twin-twin transfusion, diagnosed at the time of the latest growth scan at 34'10" weeks of gestation. The sonographic findings included normal fetal growth and Dopplers for both fetuses, but with the presence of moderate polyhydramnios in twin 1 (T1), with oligohydramnios and visible bladder in twin 2 (T2) (TTTS Stage 1). Both babies were born in good conditions with APGARS of 9 at 1 minute and 10 at 5 minutes, and weights of 2.7kg and 2.5kg for T1 and T2 respectively. Due to persistent tachypnoea, T2 was transferred to NICU and commenced on CPAP and benzylpenicillin and gentamicin for suspected sepsis. It was noted that he had poor urine output; his creatinine was elevated (191 umol/L) with associated hyperkalaemia of (6.1 mmol/L) and metabolic acidosis. A renal ultrasound showed bilateral small kidneys with grossly abnormal echogenicity, loss of corticomedullary differentiation, nephrocalcinosis and poor perfusion bilaterally. His renal function continued to deteriorate. After discussion with his family, and because of his small size, he was not a candidate for renal replacement therapy and was managed conservatively with fluid restriction, diuretics, and dietary measures. He was discharged on day 146 of life. He has been reviewed intermittently by the renal team. While his renal function remained stable with his creatinine ranging between 350-400 umol/l and his urea 30-40 mmol/L, the primary issues have been his poor growth with his weight being below <0.4th centile. He remained under ongoing palliative care of symptom management and currently has a do not resuscitate order in place.

Conclusion
A few small studies have reported in regards to acute renal failure secondary to TTTS. In most of those cases the outcome was investigated following conservative management versus laser therapy for fetuses up to 26 weeks of gestation with stage 2 TTTS or higher and in cases with stage 1 associated with symptomatic polyhydramnios. It was showed that the risk of short-term renal dysfunction in TTTS treated with laser surgery was low, suggesting a protective role of laser. In our case report the TTTS occurred later in pregnancy, at 34 weeks of gestation, resulting in postnatal acute renal failure for the donor twin. It becomes apparent the need for further research in the short term and long-term outcomes of similar cases, in order clinicians to provide the optimal counselling and support to the future parents.