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TRAP Sequence with cardiac activity: is a reversed flow the only way?

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Introduction

Twin Reversed Arterial Perfusion (TRAP) sequence is traditionally defined as an acardiac twin being perfused by the pump twin via reversed arterial flow through umbilical arterio-arterial anastomosis. We present an atypical case of a TRAP twin with **a pulsating rudimentary heart** and explore whether reversed arterial perfusion is indeed the only circulatory mechanism.

Case description

A 35-year-old nulliparous woman with a monochorionic triamniotic triplet pregnancy was referred to our centre at 13 weeks of gestation. We diagnosed a TRAP sequence with a rudimentary but pulsatile cardiac structure in the recipient twin. The colour and power Doppler study of **the TRAP twin umbilical artery showed a singular "double-wave" pattern**, with arterial flow directed from this twin towards the placenta, indicating a partial intrinsic circulation rather than a reversed arterial and venous system. The clinical course was characterised by progressive growth and hydrops of the TRAP twin, and polyhydramnios in the pump twin, suggesting increased hemodynamic burden. At 17+6 gestational weeks, we performed an uncomplicated single cycle of radiofrequency ablation with immediate cessation of flow and cardiac activity in the TRAP twin. Three days later, follow-up showed intrauterine demise of the co-twins.

Conclusion

This case report challenges the traditional view of TRAP, as it suggests that some recipient twins may have **partially autonomous circulation with non-reversed perfusion**, showing flow through their vena cava to the rudimentary heart, and from this to the placenta. Recognition of this variant may have relevant clinical implications, particularly when cardiac activity persists at later gestation. A more detailed characterisation of the underlying haemodynamics could support prenatal counselling and tailored management.

Figure 1. Flow through the umbilical arteries toward the placenta

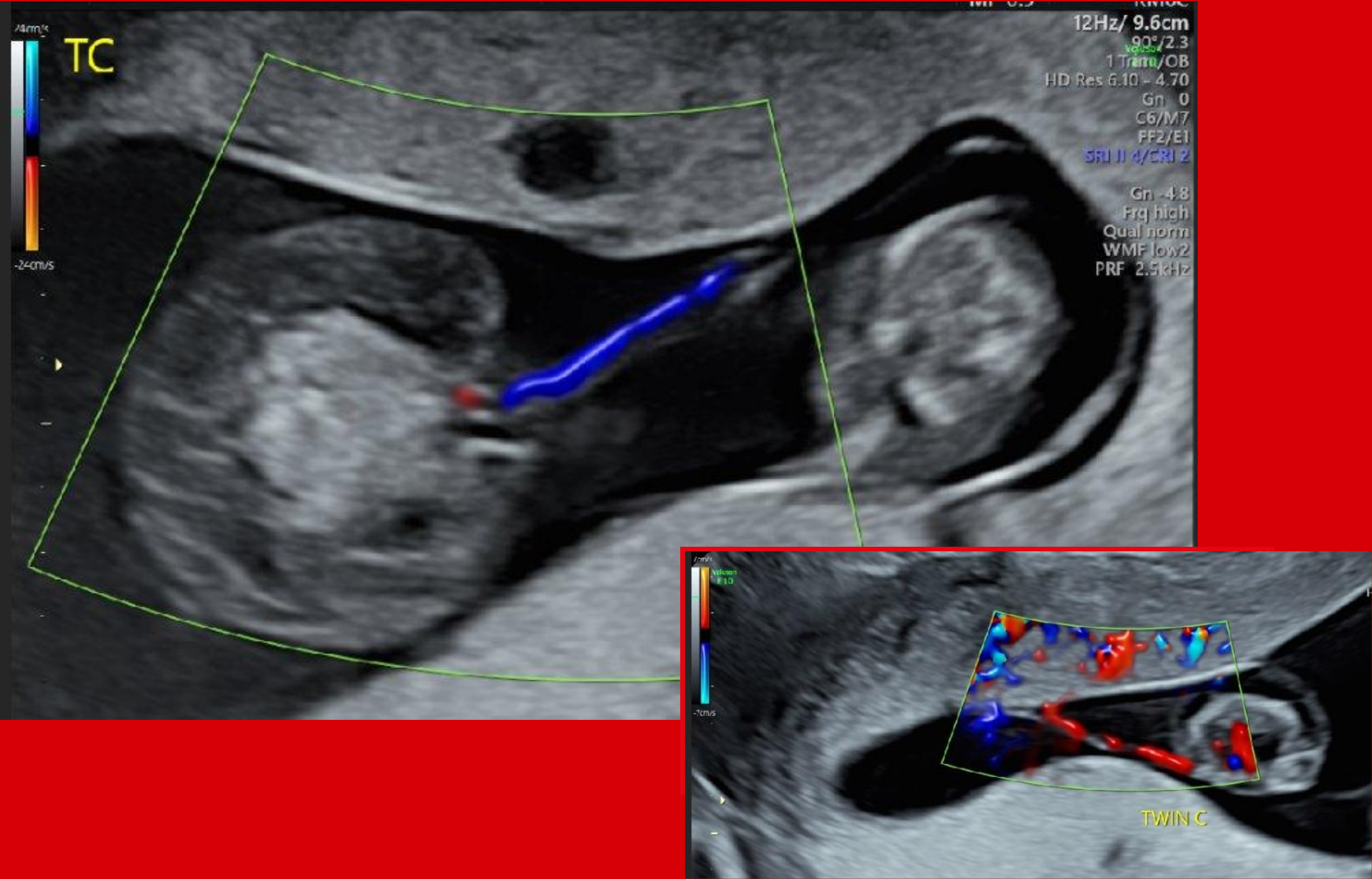


Figure 2. Power Doppler study showing a "double-wave" pattern

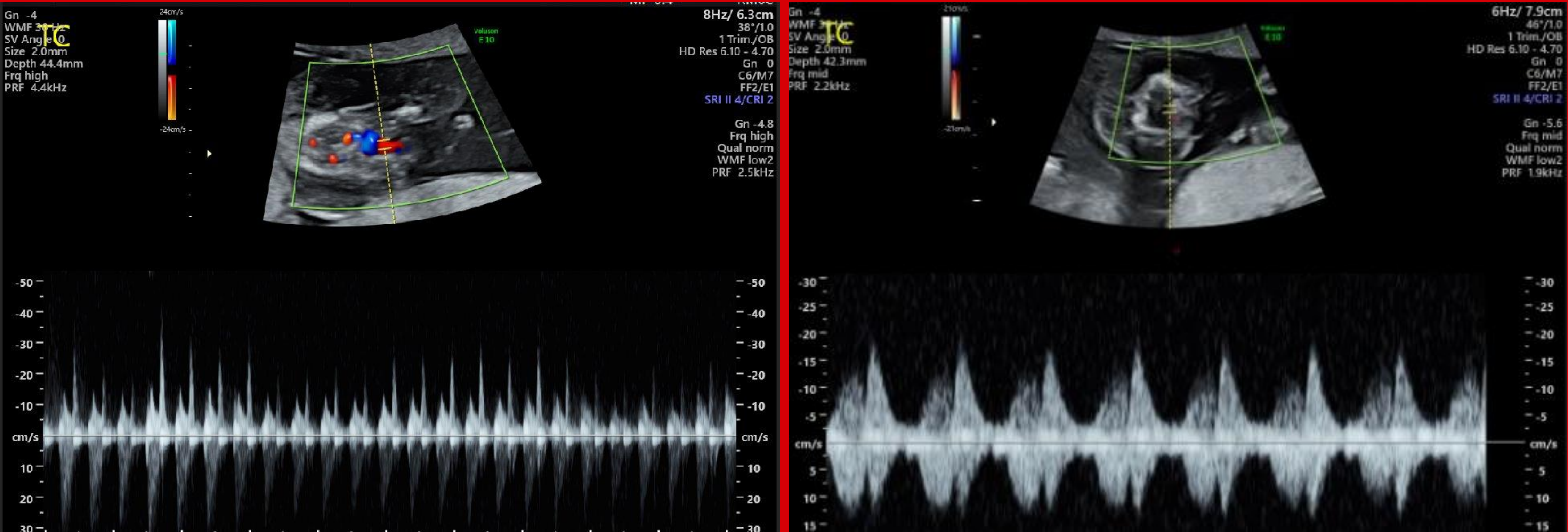


Fig. 2-a. Arterial flow in the umbilical cord Fig. 2-b. A pulsating rudimentary heart