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Serial Assessment of Umbilical Venous Flow Volume in a Large Non-Isolated Fetal Intra-Abdominal Umbilical Vein Varix: A Case Report

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Introduction

Fetal intra-abdominal umbilical vein varix (FIUVV) is associated with an increased risk of intrauterine fetal death, particularly in non-isolated cases or when complicated by thrombosis or blood flow stasis. However, optimal surveillance parameters for predicting adverse outcomes remain unclear.

Case Presentation

A 28-year-old primigravid woman was referred at 19+4 weeks of gestation following the detection of a single umbilical artery, renal agenesis, and FIUVV. Detailed ultrasonography confirmed a right single umbilical artery, left renal agenesis, persistent left superior vena cava, and a round FIUVV measuring 10.8 mm. The case was classified as non-isolated FIUVV. The varix progressively enlarged to 22.9 mm by 36 weeks of gestation, and fetal growth restriction became evident. Despite these concerning findings, serial assessment of UVFV demonstrated stable flow without evidence of thrombosis or abnormal Doppler parameters, supporting continued expectant management. The pregnancy was successfully prolonged to term, and an emergency cesarean section was performed at 38+1 weeks due to premature rupture of membranes and breech presentation, resulting in the delivery of a 2,120 g infant (−2.1 SD). Postnatal ultrasonography at 12 hours confirmed complete resolution of the varix.

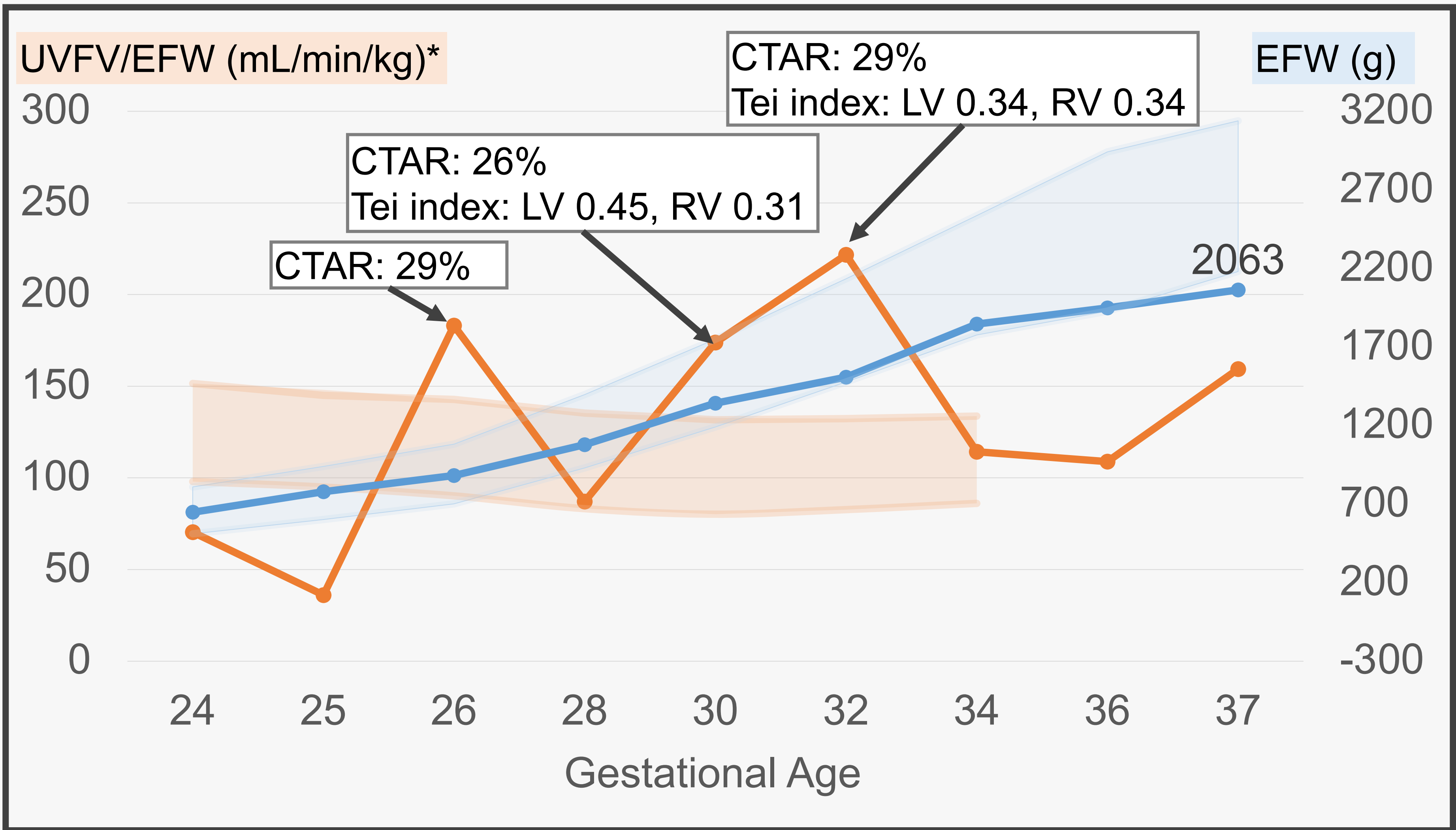


Figure 1. Serial Changes in UVFV/EFW and EFW

* $UVFV\ (mL/min) = \pi \times (UV\ diameter/2)^2 \times UVmax \times 0.5 \times 60$
 $UVFV/EFW\ (mL/min/kg) = UVFV \div EFW \times 1,000$

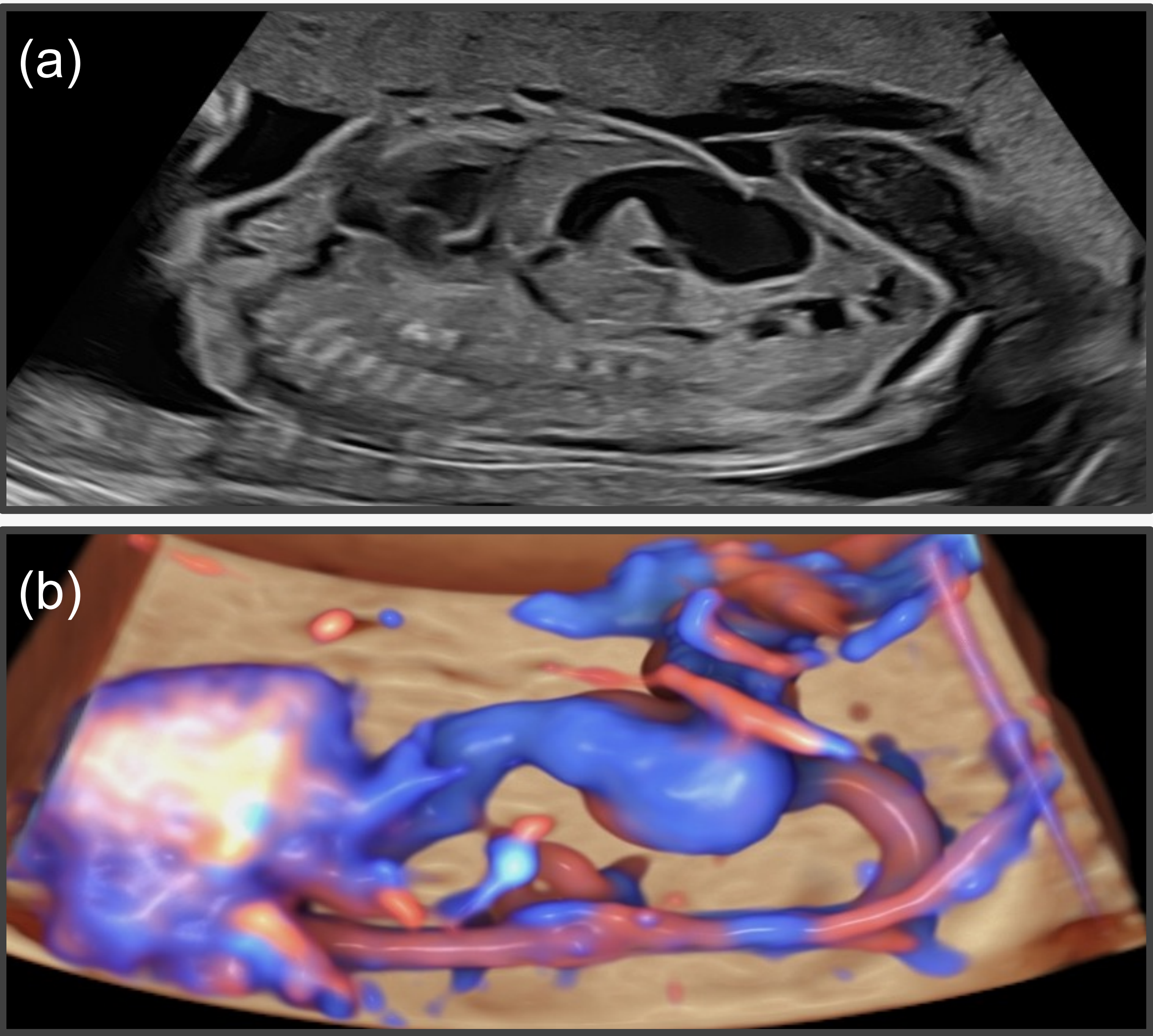


Figure 2. Ultrasound (a) and 3D color Doppler (b) images of the FIUVV. FIUVV demonstrating dilatation with a maximum diameter measured at 10.8 mm. (19+4 weeks)

Conclusion

- Marked enlargement of FIUVV was not accompanied by deterioration in conventional Doppler or fetal cardiac parameters.
- Serial UVFV/EFW changes did not parallel changes in varix size or fetal cardiovascular status.
- UVFV may provide complementary hemodynamic information, but its clinical significance in FIUVV requires further investigation.