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Analysis of middle hepatic vein flow and liver tissue stiffness in the assessment of fetal well-being in FGR cases

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Objectives

To standardise a new screening method for detecting early signs of cardiovascular dempensation in cases with FGR.

Rationale:

Under hypoxic conditions, reduced portal vein contribution to hepatic blood flow may lead to liver ischemia

Methods

In preliminary studies, we identified **12 fetal cases** – including those appropriate for gestational age (6) and those affected by advanced fetal growth restriction (6). We assessed the tissue stiffness of both hepatic lobes using shear wave elastography, taking 6-10 readings from each lobe, and measured the minute flow through the middle hepatic vein using color doppler.

We hypothesised that in the liver parenchyma of fetuses with particularly severe FGR, there would be areas of increased stiffness, which might correspond to foci of ischaemia or fibrosis of the organ.

Results

1. Middle hepatic vein flow

Mean flow velocity was higher in FGR than in normally growing fetuses:

32,75 cm/s ±12,89 vs. 26,36 cm/s ±15,52

2. Prenatal liver elastography

No significant difference was found between normal fetuses and those affected by FGR

3. Postnatal conformation

Neonatal liver elastography showed stifness increases of up to several times the antenatal values in the most severe stages of FGR

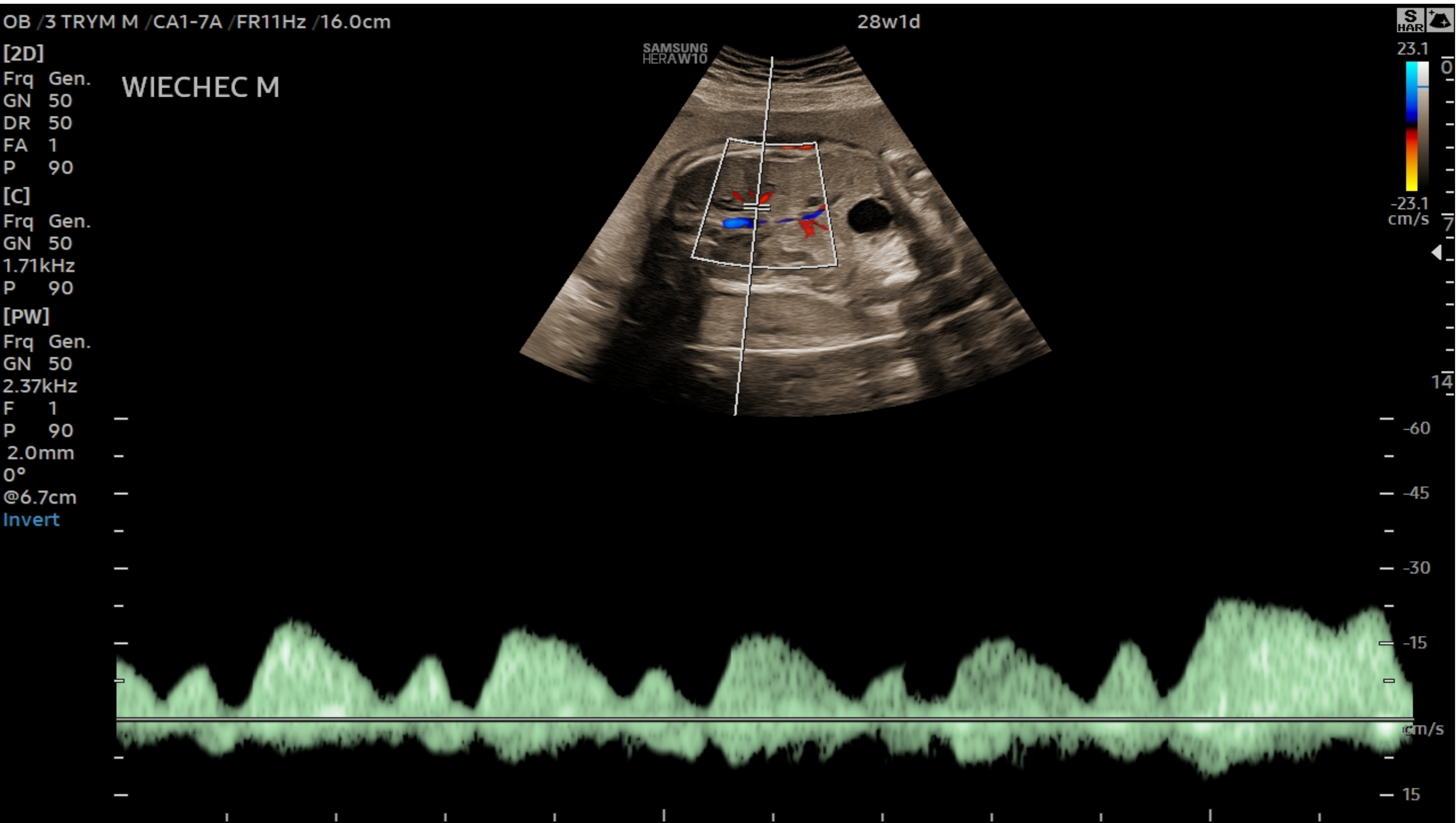
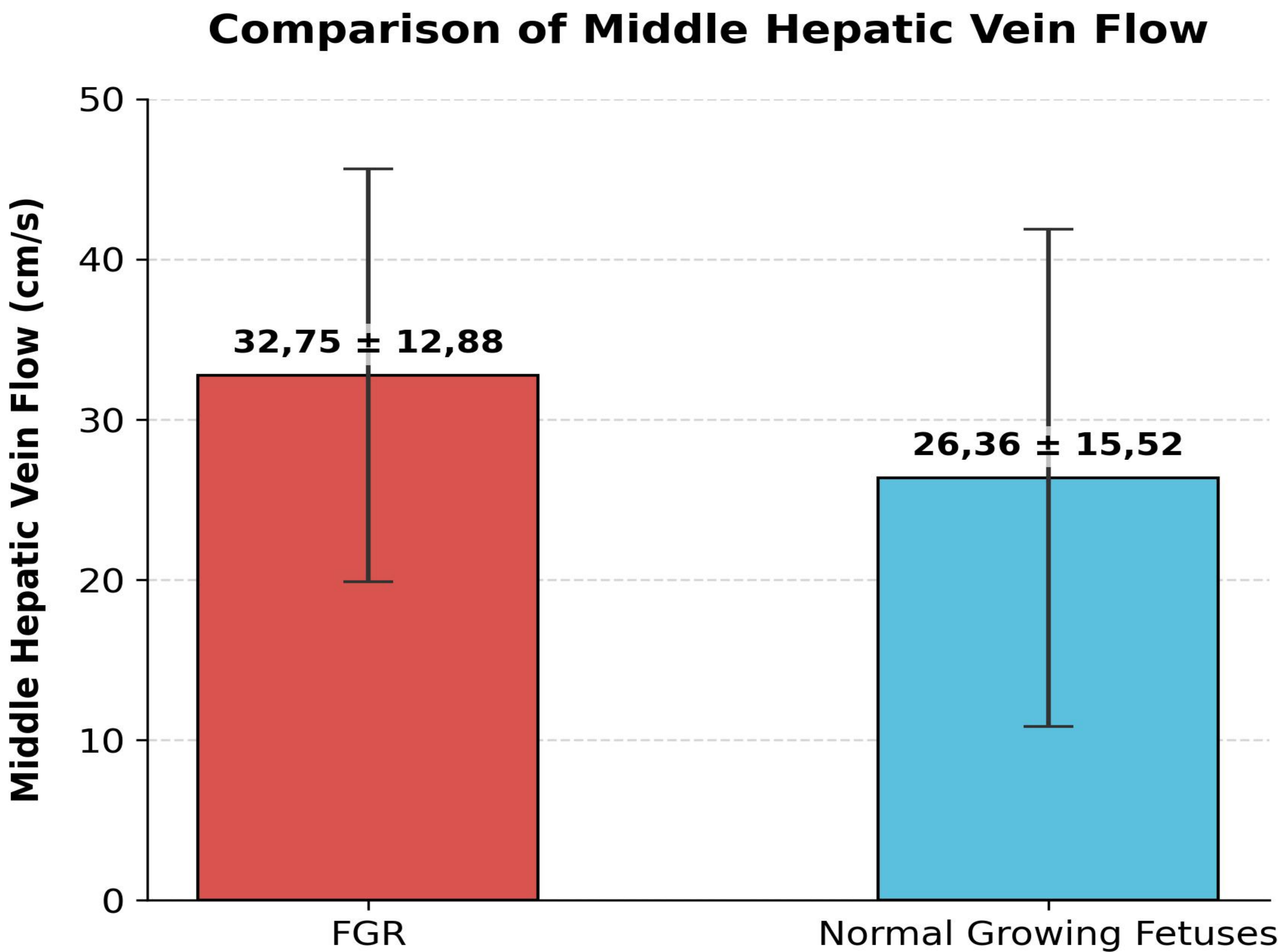


Figure 1. Doppler waveform from MHV obtained transabdominally in 28hbd AGA

Conclusions

Monitoring of middle hepatic vein flow may be useful in assessing early signs of cardiovascular decompensation during fetal life.

Prenatal liver screening using shear-wave elastography does not allow for the identification of fetuses with early signs of circulatory decompensation in FGR cases.

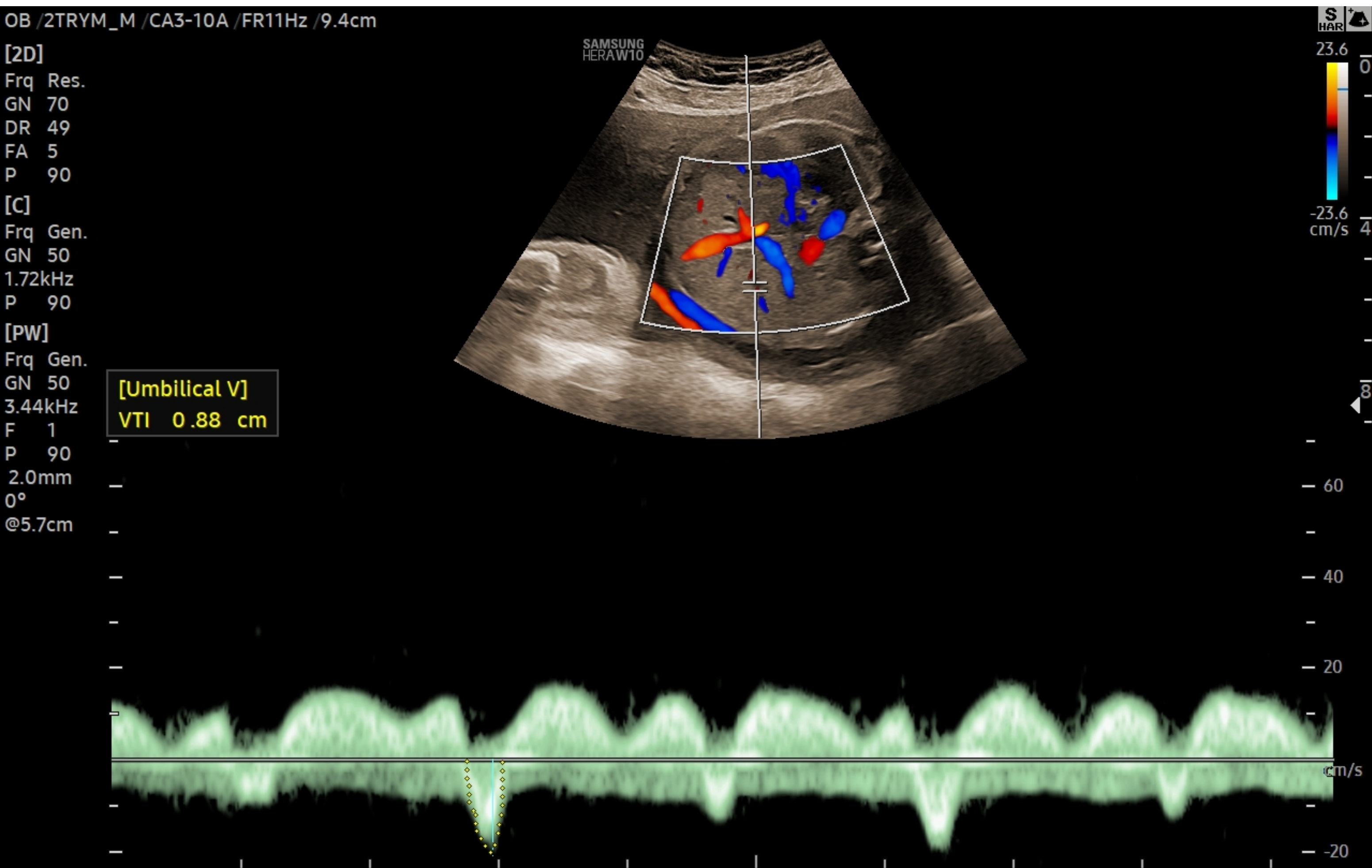


Figure 2. Doppler waveform from MHV obtained transabdominally in 28hbd FGR