

Pancreatic growth and fetal growth restriction: a missing piece of the puzzle?



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Introduction

Animal models have shown impaired pancreatic islet development in cases of fetal growth restriction (FGR), which can be evident at or before birth and persist into maturity leading to glucose intolerance. In this study we evaluated the correlation between fetal pancreas biometry and FGR.

Methods

A retrospective cohort study included fetuses diagnosed with FGR who underwent prenatal ultrasound at a tertiary center. Pancreatic circumference was measured and compared to established normative reference values. Associations between pancreatic size and estimated fetal weight (EFW), abdominal circumference (AC), Doppler findings, gestational age (GA), concurrent gestational diabetes mellitus (GDM), and the presence of anatomical or genetic abnormalities were analyzed.

Results

The mean gestational age (GA) at evaluation was 31.3±3.4 weeks (range 29.1-33.8). There was a moderate correlation between EFW and pancreas circumference (Pearson r = 0.607). Maternal GDM was present in 10/52 (19.2%) of cases. There was no correlation between abnormal Doppler indexes, GDM, or post-natal hypoglycemia and pancreas circumference. In 14/52 (26.9%) and 11/52 (21.1%) fetuses, the pancreas circumferences were below the 10th and 5th centile for GA, respectively. ES showed likely pathogenic/pathogenic (LP/P) variants in 3/26 patients, including NSD2, KDM2B and in the 3rd case a PLCB4 variant featured along with a de novo VUS in VEGFA. All three cases exhibited severe FGR (<3rd centile), abnormal CNS findings and pancreas circumference below the 10th centile, a phenotype not previously described.

Conclusion

Fetuses with FGR exhibited reduced pancreatic size. These findings highlight the pancreas as a novel imaging marker and warrant further investigation into long-term metabolic programming

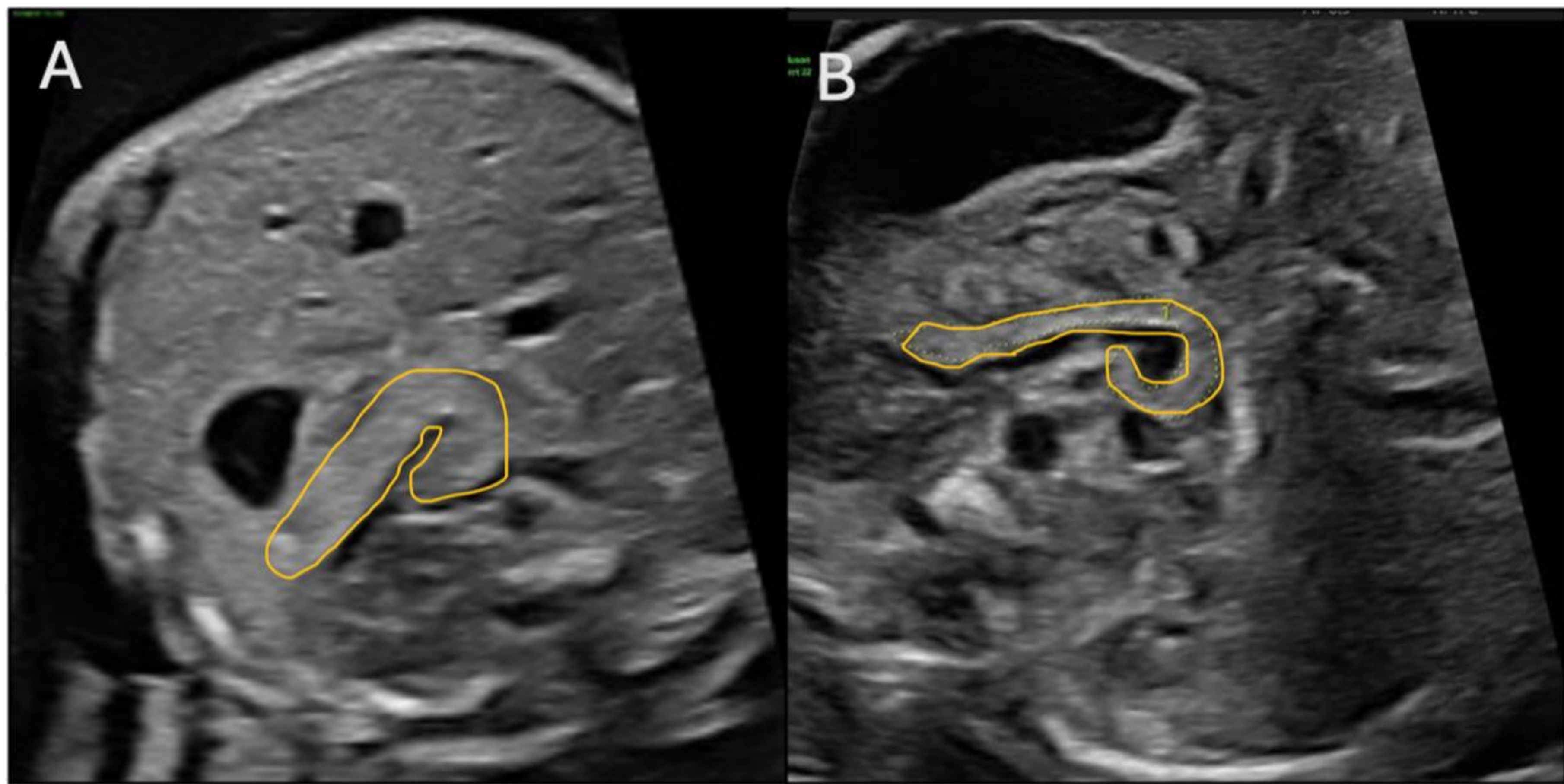


Figure 1

Comparative ultrasound images at 27 weeks of gestation of the fetal pancreas. The image was obtained in an axial plane at the level of the stomach and the splenic vein. (a) an appropriate-for-gestational-age (AGA) fetus with normal pancreatic size; (b) a fetus with fetal growth restriction (FGR) demonstrating a hypoplastic pancreas. The FGR fetus showed abnormal Doppler flow parameters and was delivered at 29 weeks, weighing 900 grams.