

Fetal optic chiasm 2D ultrasound measurement: improving the counselling in cases of agenesis of septi pellucidi

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Objective

Septal agenesis is associated with midline defects or optic abnormalities and its counselling represents a real challenge in fetal medicine. The aim of this study was to describe an objective method to visualize and measure the optic chiasm (OC) through a 2D coronal plane and to report measurements in fetuses with agenesis of the septi pellucidi (SP).

Methods

This was a prospective cross-sectional study of 115 morphologically normal fetuses in low-risk pregnancies undergoing routine ultrasound examination at 21–30 weeks gestation. OC was measured in a vaginal coronal plane at the level of third ventricle and was seen as a horizontally aligned dumbbell-shaped structure of moderate echogenicity. Anatomical references were the hyperechogenic horizontal segments of middle cerebral arteries on each side and the hypoechoic suprasellar cistern above of it. We also measured OC in eight fetuses with agenesis of the SP and compared these measurements to the reference range.

Results

C measurements were obtained in 110 of 115 normal fetuses. Fetal OC diameter measurements were fitted adequately with a regression linear model as follows: OC width (mm) = $0.078 + (0.275 \times GA)$ where GA is the gestational age closest to the nearest week. Our method demonstrated good intraobserver repeatability and excellent interobserver reproducibility. Among the eight fetuses with agenesis of the SP, four had normal measurements, and five had normal vision postnatally.

Conclusion

Our study demonstrates for the first time that it is possible to measure directly OC through a regular 2D ultrasound coronal plane. OCD growth occurred linearly with gestational age. In fetuses with agenesis of the SP, the morphology and width of the OC visual pathway was helpful in assessing its development.