

Normalization of Corpus Callosum Length to Fetal Head Size using CC/FOD Ratio: Toward an Individualized Approach to Prenatal Corpus Callosum Assessment.

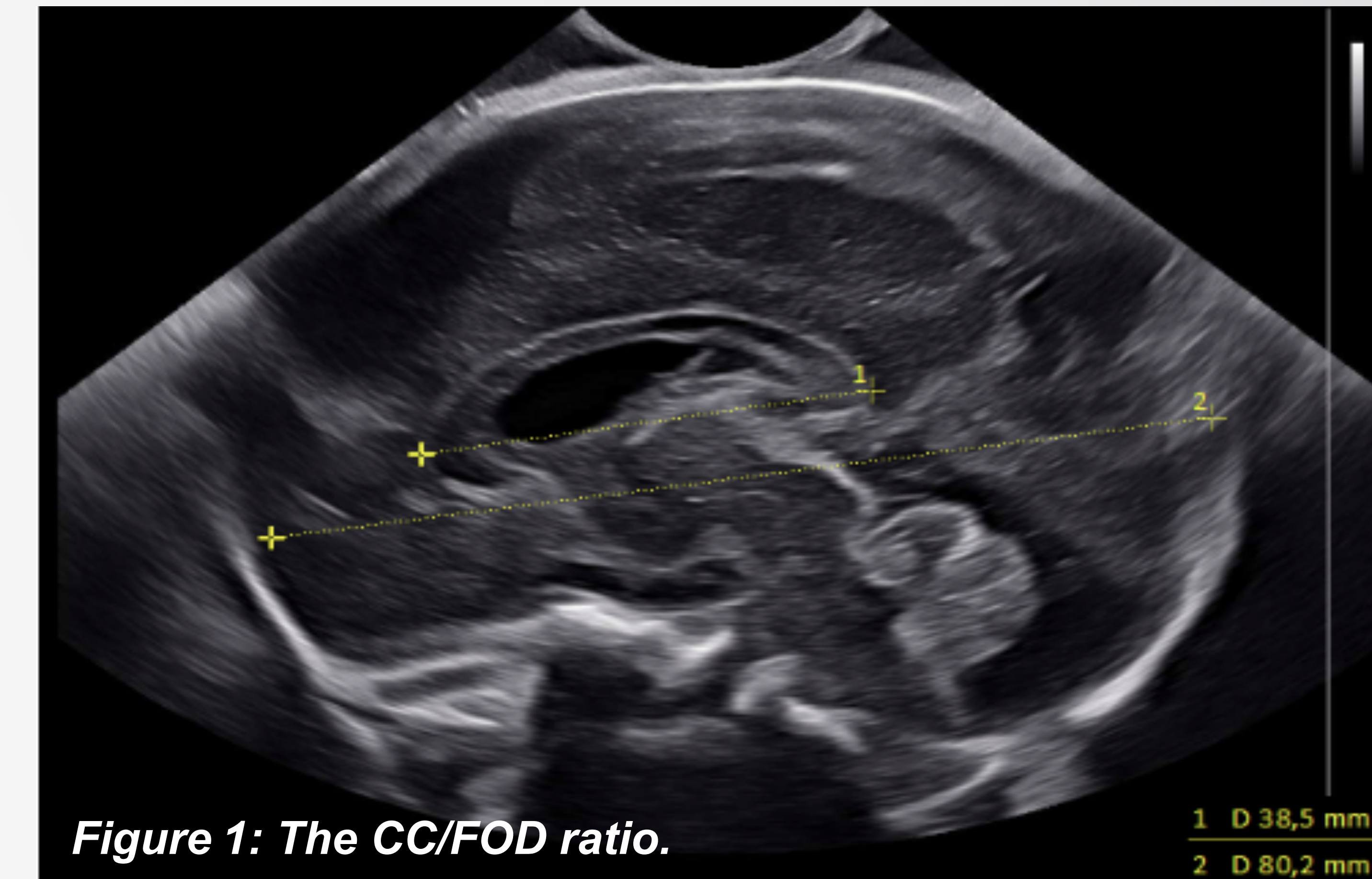
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Objectives

To evaluate whether normalization of corpus callosal length to fetal head size using the **corpus callosum/fronto-occipital diameter (CC/FOD) ratio reduces measurement variability** and provides an **individualized metric** for prenatal assessment of corpus callosum development **independent of gestational age**—based reference charts.

Results

A total of **82 fetuses** were included. Absolute CC length demonstrated strong correlations with gestational age ($r \approx 0.86$, $p < 0.001$) and fetal head size ($r \approx 0.95$, $p < 0.001$). Absolute CC measurements showed substantially higher variability compared with the CC/FOD ratio (**CV 25.1% vs 8.4%**). Levene's test confirmed a significant difference in variance between the two measurements ($p < 0.001$). In contrast to absolute CC length, the **CC/FOD ratio remained relatively stable across gestational ages**.



Methods

This **retrospective study** included fetuses undergoing prenatal neurosonography with measurable corpus callosum and available postnatal confirmation of normal corpus callosum development. Corpus callosal length was measured in the midsagittal plane using standard ultrasound techniques. Measurement variability was assessed using standard deviation and coefficient of variation (CV). Differences in variance between absolute CC length and the CC/FOD ratio were evaluated using **Levene's test**. Associations between CC length, gestational age and fetal head size were assessed using **Pearson correlation** and **linear regression analysis**.

Conclusion

Corpus callosum length scales strongly with fetal head size. Normalization of CC length to fetal head size using the CC/FOD ratio significantly reduces measurement variability and provides a relatively gestational age-independent metric for evaluating fetal corpus callosum development.

This ratio may complement or potentially simplify current assessment strategies based on gestational age-specific reference charts by allowing individualized interpretation of corpus callosum size.