Introduction

Interpretation of fetal brain structures and in particular, the ventricular system (VS) on 3D ultrasound scans (USS) in early pregnancy is hampered by lack of an appropriate reference standard. We aim to validate the 3D appearances of the VS from 8 to 11 weeks gestation using embryological expertise and digitally reconstructed 3D embryological models as a gold standard.

Methods

Weekly USS were performed on 14 patients from 8 to 11 weeks gestation using 2DUS and 3DUS with Crystal Vue and Realistic Vue™. Collaborative work with embryologists was undertaken to validate the anatomy seen on 3DUS with gestation-matched 3D embryological models.

Results

The VS can be reliably visualised using 3DUS with rendering software as early as 8 weeks gestation, which is not possible with 2DUS alone.

Conclusion

3DUS with appropriate rendering enables novel visualisation of the VS, which we have validated with embryological models. This may enable more detailed assessment of the fetal central nervous system, and detection of anomalies much earlier in pregnancy.