A study of post-mortem three-dimensional ultrasonography with novel rendering to assess fetal anatomy

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Aim
To assess the visualisation of post-mortem (PM) fetal anatomy in stored specimens with 2D and 3D ultrasound (US) and ascertain if 3DUS with rendering can be used to obtain reference images for use in clinical practice.

Methods
2DUS (excluding heart) and 3DUS with Crystal Vue and Realistic Vue™ rendering was performed on 20 formalin-fixed fetuses (10-24 weeks gestation) in a degassed water bath to mimic in-utero US. The confidence of visualisation (CoV) of anatomical structures in 2D+3D and 2DUS alone was scored on a 3-point Likert scale.

Results
The mean CoV of fetal anatomy improved by 0.038 (p=0.007) for a combined 2D+3DUS approach compared with 2DUS alone. 3DUS improved visualisation of the fetal face, abdominal structures and skeleton up to 18 weeks gestation, and in particular, at 10-12 weeks.

Conclusion
2D+3DUS allows more thorough PM anatomical assessment than 2DUS alone; it may help to improve anomaly diagnosis, particularly in the first trimester, and facilitate minimally-invasive autopsy. 3DUS of PM pathology can produce images which may be useful for teaching purposes.

Three-dimensional PM ex-utero imaging with Crystal Vue & Realistic Vue™ rendering applied