Volumetric ultrasound – the on-line added value

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Objective
The main application of volumetric ultrasound (3D/4D US) is the off-line analysis, for detailed descriptions of the fetal systems. Our aim was to assess if using 3D/4D US has an on-line added value in demonstrating to the parents the normality or abnormality of the fetus, and modifying the operator’s degree of confidence in the prenatal diagnosis, in the first (FT) and the second trimester (ST) of pregnancy.

Methods
This is a prospective study on singleton pregnancies between 12 and 28 weeks. At the end of the initial scan the forms were filled in. The subjective assessment of the contribution of 2D and 3/4D techniques regarding the information obtained was noted on a scale from 1 to 10 by both operator and patient.

Results
We included 100 normal cases and 23 cases of fetal anomalies. In normal cases, the level of the operator’s confidence raised statistically significant (p<0.05, Wilcoxon Signed Ranks Test) by 3D for facial and spine in the FT, and for the fetal profile in the ST. 2D proved to be superior for increasing operator confidence in normality for calvaria, extremities, abdominal wall and brain in the FT and the ST. Patients were more confident in normal anatomy by 3D vs 2D for spine and brain in the FT and for spine, calvaria and abdomen in the ST. 2D statistically increased the patient confidence level in normality for extremities and fetal profile in the FT, and for the fetal face and profile in the ST. There were no significant differences between 2D and volumetric US in the demonstration of normality of the heart and in skeleton, facial and brain anomalies during both trimesters, for both subjects.

Conclusion
Volumetric ultrasound has helped in demonstrating the fetal surfaces. On a daily basis there is no evidence of benefits in anomaly detection. The gestational age has a critical importance in the amount of information contained in the volumes, similar to 2D scan. We need to understand what systems will benefit from volumetric ultrasound application. For the moment, these techniques serve for scientific purposes only.