The comparison of 3D fetal images obtained by Ultrasound and Magnetic Resonance Imaging in the third trimester

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**Objectives:**
The objective here is to compare 3D fetal images obtained by US and MRI at the same day in the third trimester.

**Methods:** 56 fetuses with external malformations. MRI reinforced the previous preliminary 3DUS findings, and diagnosis were confirmed postnatally. The pathologies evaluated were: holoprosencephaly, Chiari II, craniosynostosis, cervical teratoma, cervical lymphangioma, cleft lip, gastroschisis, limb body wall complex, limb reduction, ectrodactyly, achondroplasia, Beckwith-Wiedemann syndrome, Down syndrome, Apert syndrome, sacrococcygeal teratoma, club feet, conjoined twins.

3DUS scans were performed transabdominally (Voluson 730 Pro/Expert; Voluson E8 and E10, GE). MRI was 1.5-T (Magneton Avanto, Siemens). The standard protocol included conventional 2D T2-weighted (Haste). Additionally, 3D T2 weighted truefisp sequence (trufi) was applied. Examination time did not exceed 40 minutes. The 3D images were transferred to a workstation to post-process them. First, maximum intensity projection (MIP) images were reconstructed and the gestational sac was manually segmented. After this, the images were volume rendered (VRT) and the amniotic fluid was removed by threshold techniques.

**Results:**
Despite of the 3DUS development, the quality of 3D images obtained from MRI was superior in some cases. 3DUS had some limitations, such as being influenced by fetal position, the amount of amniotic fluid, and maternal obesity. Fetal movements during image acquisition were one of the principal difficulties for MRI.

**Conclusions:** The key concern of this study was to obtain high-quality 3D images from US / MRI and to compare them. The 3D evaluation should be used as a complementary tool since it adds valuable information to the educational training of specialists as well as to the emotional control of parents. However, these 3D imaging modalities do not appear to be absolute for the diagnosis and evaluation of fetal prognosis.