MRI of the Fetus in Utero: A Practical Guide to Systematic Analysis - Central Nervous System

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Purpose

Well-established protocols exist for the sonographic examination of the fetus, encompassing differing levels of detail depending on the overall risk of the individual pregnancy (i.e. when a routine screening examination up to a tertiary-level detailed assessment or a high-risk program). No such protocols are established yet for fetal MRI imaging. In our institution, we have attempted to establish a protocol for reporting fetal MRI examinations, in order that a systematic and methodical detailed assessment of high-risk pregnancy. No such protocols are established yet for fetal MR imaging. In our institution, we have attempted to establish a protocol for reporting fetal MRI examinations, in order that a systematic and methodical detailed assessment of high-risk pregnancy.

Ultrasonic protocols

We compiled a chart of the amalgamated current guidelines for sonographic assessment of the fetus from several institutions: The American College of Radiologists, The Association for Ultrasound in Medicine, The American College of Obstetricians and Gynecologists, The Society of Obstetricians and Gynecologists of Canada, the Canadian Association of Radiologists, and the Royal College of Obstetricians and Gynaecologists (UK). This chart is presented below. It is interesting to note the discrepancies.

MR Imaging of the Fetus in Utero I: A Practical Guide to Systematic Analysis - Central Nervous System

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Purpose

We found that there were significant inter- and intra-institutional variation in the quality of the ultrasonic sonographic assessment. Certain factors that particularly affected the ultrasonic sonographic examination included maternal obesity, late gestational age and polyhydramnios.

We felt that in these situations, the minimum standard for ultrasonic MR assessment should be the same as for antenatal US examination. However, we appreciate that certain structures cannot be reliably assessed by current antenatal MR technique, and that it is not possible to completely negate the limitations of US examination. For example, the posterior fossa and its serial image, particularly if polycystic in later gestation, inhibits US assessment.

We adopted the amalgamated guidelines for sonographic assessment, and follow them as is possible when performing MRI assessment. We demonstrate a practical guide for analysis of the central nervous system of the fetus in utero, including how to perform the biomorphic measurements, and examples of normal and abnormal anatomy and development.

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