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Fetal Ventricular Measurement in Determination for Intrauterine Closure of Myelomeningoceles

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Research Abstract Title

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Other authors/contributors involved in project: Emmanuel Vlastos MD

IRB Number: n/a

Describe role of Submitting/Presenting Trainee in this project (limit 150 words):
Analysis of current literature regarding intrauterine myelomeningocele closure. Continued collection and analysis of CMH data.

Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words

Background:

Prenatal closure of myelomeningoceles has been shown to decrease the need for shunting at one year of age and improve composite mental and motor function scores. Post-hoc analysis of the MOMs trial however, reported that fetuses with ventricular width of >15 mm at the time of intrauterine screening (19-25 weeks) received no benefit from prenatal closure with regards to need for treatment of hydrocephalus (Tuliplan, et al, JNS PEDS, 2015). This data has led to a change in counseling and practice for prenatal closure. However, little is documented regarding the details of ventricle measurement, modality, and timing.

Objectives/Goal:

We have analyzed our results of ventricle measurement with ultrasound (US) and fetal magnetic resonance imaging (MRI). Our goal is to better understand how the imaging modality and timing can affect the measurement of ventricular size and thus counseling of patients.

Methods/Design:

Eight consecutive neonates who underwent prenatal myelomeningocele repair at Children's Mercy Fetal Health Center were reviewed. We compared the dates of prenatal US and fetal MRI. We calculated differences in ventricle measurements between the two modalities.

Results:

The average gestational ages at fetal US and MRI were 21.8 and 21.4 weeks, respectively. Often the two imaging modalities were performed only days apart (average 0.375 weeks). US and MRI

measurements showed average down ventricle sizes of 7.7 mm (range 4.7-13.4 mm) and 9.5 mm (range 7.0-16.0 mm), respectively. The average discrepancy between the two imaging modalities was 1.9 mm with MRI more often measuring larger.

Conclusions:

US and MRI provide different results in regards to fetal ventricle size. MRI most often estimated ventricle size to be larger than US. This holds true regardless of timing between the images. Standardization of timing and modality to measure fetal ventricle size should be established. If treatment recommendations are going to be offered or withheld based on the 15 mm “rule” method of fetal imaging must be taken into account.