

The correlation of anatomical versus motor level in the prenatal repair of open spina bifida

TRIGO L, MONSON M, LLANES A, CHMAIT RH, LAPA DA, Catissi G
Hospital Israelita Albert Einstein, Sao Paulo, Brazil

Objective

To determine if the lower extremity motor function (MF) of a fetus with open spina bifida (OSB) deteriorates within a four weeks interval between their first prenatal motor assessment and the second presurgical evaluation in cases operated at later gestational age (around 27 weeks), and to compare both prenatal and postnatal MF to the anatomical level (AL).

Methods

Multicenter cohort study, including two centers using the SAFER technique evaluated 93 fetuses with OSB who underwent two prenatal ultrasound evaluations before fetal surgery (MF1 and MF2) and one postnatal evaluation (MF3). MF classification was performed according to key muscle function from L1 to S1. Prenatal assessments were performed by ultrasound at the first visit and the second evaluation occurring before fetoscopic repair. Postnatal evaluation was done within the first two months of life. Each leg was analyzed individually; in case of MF discrepancy, the worst level was considered for analysis. All MF evaluations were compared to the anatomical level. Finally, a logistic regression was performed to obtain independent factors for the MF variation in each case.

Results

Prenatal MF was assessed at 22.5 (20.7-24.3) and 26.9 (25.4-27.3) weeks, with a median interval of 4 (2.4-6) weeks in between. Median gestational age at surgery was 27 (25.6-27.6) weeks. No significant difference in MF was found between both prenatal evaluations within this range ($p=0.832$). All prenatal and postnatal MF evaluations were significantly different from the AL (MF1 vs AL, $p=0.002$; MF2 vs AL, $p=0.002$; MF3 vs AL = 0.033). While only 20% of cases had the same postnatal MF and AL, prenatal MF was similar to postnatal MF in 50% of cases ($p=0.001$), and improved in 20% of cases. Gestational age at surgery, type of defect (myelomeningocele vs myeloschisis), and AL were not independent predictors for the MF variation.

Conclusion

The 4-weeks interval between the first evaluation and the "late" fetal surgery does not change significantly the MF, suggesting later repair does not have an impact on motor outcome. The anatomical level is different from the postnatal MF in 80% of the cases, for better or worse. Prenatal motor function is maintained or improved after birth in 70% of the cases and maybe it should be a better metrics for counseling parents and offering the repair than the anatomical level.