

## **The impact of a biocellulose based fetal repair of open spina bifida**

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### **Objective**

Our aim is to report the need to untether the cord after prenatal repair of open spina bifida using a biocellulose based technique, performed at a later gestational age of surgery.

### **Methods**

Observational cohort study to determine the incidence of tethered cord syndrome. From May 2013 to May 2022, we operated 172 cases using a percutaneous fetoscopic approach between ~26-28 weeks. After the placode dissection, a biocellulose patch is placed to cover it, a myofascial flap (CHOP technique), was performed whenever possible, finally the skin is closed with or without an artificial skin. 23 cases were excluded due: 3 failed repair, 2 intrauterine fetal and 6 neonatal deaths, 1 termination, 3 deaths before and 3 after 12-months, 2 denied participation and 1 was lost from follow-up. Cord tethering syndrome was defined by the appearance of symptoms of medullar stretching: breathing and deglutition problems, progressive scoliosis, change in gait, spasticity and worsening of bladder or intestines. Infants were evaluated and operated by local neurosurgeons, after an MRI examination. Infants over 30-month had ambulation and neurodevelopment evaluated using the PEDI (Pediatric Evaluation of Disability Inventory) scale. We compared the cohorts of the larger series reporting cord tethering after prenatal repair at 12-months, with the present study results. We used the Fisher exact-test and a statistical significance at  $p < .05$ .

### **Results**

From the total 172 cases the median gestational age of surgery was 26.7 weeks and median gestational age of delivery was 33.2 weeks. 23 cases were not available for postnatal follow-up. From the 149 cases available CSF diversion occurred in 38% and bladder catheterization in 36%. 13 patients were less than 12-months, and 6 out of 136 (5%) patients needed to untether the cord: at 20, 26, 49, 60, 60 and 68-months, for the following reasons: 1 bladder worsening, 2 intestinal worsening, 1 dermoid cyst, 1 progressive scoliosis and 1 legs atrophy. From the total 78 cases over 30-months, 46% were ambulating independently and 94% had normal social function. The comparison among 3 different techniques, showed an statistical significant difference with one center. 12 months Tether Yes Tether No p-value Present study 2 58 reference MOMS 6 71.465 Germany 2 69 1 TCH 9 40.0216\*.

### **Conclusion**

The biocellulose based technique has a low rate of cord tethering that is statistically lower than one of the main techniques currently in use. This may be attributed to the formation of a neoduramater, the absence of duramater suture, and/or later gestational age of surgery. We believe a comparative study is needed towards the unification of techniques.