Update on Open Fetal Myelomeningocele Repair at the Zurich Center for Fetal Diagnosis and Therapy

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Introduction

We would like to give an update on our open fetal surgery program in Zurich: Since the published MOMS Trial data, fetal surgery is the new therapeutic standard for selected fetuses with this devastating malformation. Based on this evidence, a Fetal Surgery Program for open fetal spina bifida repair was started in Zurich in 2010. This paper reports our experience with the first 13 cases.

Patients and Methods

The MOMS-Trial guidelines were strictly adopted. Operative procedures and all pre- and post-operative management regimens were basically identical with the ones used at the Center for Fetal Diagnosis and Treatment of the Children’s Hospital in Philadelphia. All patients were enclosed into our standardized follow-up program of our spina bifida clinic. No patient was lost for follow up. All data were collected prospectively.

Results

Between December 2010 and March 2014, 32 pregnant women with a fetus suffering from a myelomeningocele were evaluated for fetal repair. 16 patients (50%) did not meet the inclusion criteria and did therefore not qualify for fetal MMC repair. 16 patients (50%) met the inclusion criteria. Three of them (9%) decided to interrupt pregnancy. The remaining 13 patients (41%) underwent open fetal spina bifida repair between gestational ages 22+3 and 26+1 weeks. All operations were uneventful and all fetuses showed a complete reversal of the hindbrain herniation four weeks postoperatively in the MRI.

As of today, 11 patients were born via caesarean section between 33+6 and 37+3 gestational weeks. One baby (9%) died on day one of life due to lung hypoplasia and respiratory failure. Lower extremity function was better than predicted in 8 infants (73%). As of today, 5 children (45%) underwent ventriculopertitoneal shunt implantation and one patient (9%) underwent a third ventriculostomy.

There were no maternal deaths or significant complications. Two pregnancies are still going on.

Conclusion

Our results are comparable to those generated by the MOMS-Trial and thus further support the view that selected fetuses with MMC may benefit substantially from repair before birth.

Intraoperative views from one of our cases. a) The cystic sac (zona epithelioserosa) is being resected. In the center of the picture lies the openly exposed, non-neurulated, but macroscopically undamaged spinal cord (asterisk). b) Bilateral myofascial flaps (filled white arrows) are being sewn over the cord after severing the filum terminale (open white arrow). Note the stapled and thereby perfectly sealed, dry, uterine wall (black arrow). c) Fetal back after primary skin closure. There are signs of slight tension.

Fetal back on the first day of life. The skin is perfectly healed, the suture is still in place. Note the normally configured anus.

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