Fetal surgery for spina bifida

Little progress has been made in the postnatal surgical management of the child with spina bifida. Postnatal surgery is aimed at covering the exposed spinal cord, preventing infection, and treating hydrocephalus with a ventricular shunt. Experimental and clinical evidence suggest that the primary cause of the neurologic defects associated with MMC is not simply incomplete neurulation, but rather chronic, mechanical and amniotic-fluid induced chemical trauma that progressively damages the exposed neural tissue during gestation. The cerebrospinal fluid leak through the MMC leads to hindbrain herniation and hydrocephalus. In utero repair of open spina bifida is now performed in selected patients and presents an additional therapeutic alternative for expectant mothers carrying a fetus with MMC. In the past, studies in animal models and clinical case series laid the groundwork for a clinical trial to test the safety and efficacy of fetal MMC repair. In the present, a prospective, randomized study (the MOMS trial) has shown that fetal surgery for MMC before 26 weeks' gestation may preserve neurologic function, reverse the hindbrain herniation of the Chiari II malformation, and obviate the need for postnatal placement of a ventriculoperitoneal shunt. However, this study also demonstrates that fetal surgery is associated with significant risks related to the uterine scar and premature birth. In the future, research will expand our understanding of the pathophysiology of MMC, evaluate the long-term impact of in-utero intervention, and to refine timing and technique of fetal MMC surgery using tissue engineering technology [1)].

Proceedings of the SHINE conference, Belfast

Thhre is a transcript of a scientific conference on the subject of prenatal surgery for spina bifida. It represents the views of three patients, an obstetrician, a postnatal neurosurgeon, a neonatologist, a paediatric neurologist, two surgeons who practice open spina bifida foetal surgery, a fetoscopic surgeon and an obstetrician experienced in randomised trials and systematic reviews. Implications for current practice and recommendations for future research are also discussed in detail [2)].

1)
Adzick NS. Fetal surgery for spina bifida: past, present, future. Semin Pediatr Surg. 2013 Feb;22(1):10-7. doi: 10.1053/j.sempedsurg.2012.10.003. Review. PubMed PMID: 23395140.
2)
Shanmuganathan M, Sival DA, Eastwood KA, Morris K, Cartmill J, Heep A, Bohosiewicz J, Pastuszka A, Hunter A, Ali A, McConnell R, Crimmins D, Malone F, Bailie C, Deprest J, McKillop C, Alfirevic Z, McAuliffe F, Ong S. Prenatal surgery for spina bifida: a therapeutic dilemma. Proceedings of the SHINE conference, Belfast. Ir J Med Sci. 2017 Nov 3. doi: 10.1007/s11845-017-1709-6. [Epub ahead of print] PubMed PMID: 29101642.