Amniotic membrane

Surgical management of spinal dysraphism often requires the use of dural substitutes. Amniotic membrane (AM) has drawn the interest of clinicians for its valuable concentration of cytokines and factors capable of promoting wound healing, re-epithelialization, inhibiting fibrosis and regulating angiogenesis. These beneficial qualities could make AM an interesting dural substitute for spina bifida repair.

In a study, Marton et al., describe the use of banked homologous AM as a dural substitute for the repair of spinal dysraphism in newborns. Our purpose is to test the mechanical characteristics, as well as the safety and effectiveness of AM in preventing postoperative complications and re-tethering.

The AM patch was carefully detached from the chorion of donors undergoing caesarean section, rinsed in saline solution, and cryopreserved in liquid nitrogen. Five newborns were treated using AM: three affected by open spinal dysraphism and two by spina bifida occulta. The AM patch was used as a dural substitute with two different positions and purposes: the amnion-side down covering the placode to prevent adhesions or placed extradurally facing the dura to avoid scarring and facilitating the sliding of the dural sac itself under the extradural tissue layers.

No adverse events occurred, and the surgical wounds healed without complications. MRI scans taken at 3 and 6 months after surgery showed a satisfying de-tethering of the spinal cord with no obvious evidence of new adherence formation.

They present a multimodal interposition technique using AM as a reconstructive and anti-adhesive tissue for the treatment of open myelomeningocele (MMC) and lipomeningocele (LMC) treatment. In our experience, AM proved its efficacy in restoring the dural sac integrity without complications. We support the use of AM as a promising dural substitute, speculating on how the use of AM could potentially change reconstructive strategies for spinal dysraphism [1)].

1)
Marton E, Giordan E, Gioffrè G, Canova G, Paolin A, Mazzucco MG, Longatti P. Homologous cryopreserved amniotic membrane in the repair of myelomeningocele: preliminary experience. Acta Neurochir (Wien). 2018 Jun 1. doi: 10.1007/s00701-018-3577-x. [Epub ahead of print] PubMed PMID: 29858946.