

Dural Sealant Associated With Higher Complication Rates

The dura is the outer covering of the brain and spine. During Chiari surgery the dura is often opened and a graft, or patch, is sewn in to create more space. Since it is important to get a water-tight seal on the dural patch, in addition to stitches, sometimes surgeons use a synthetic, gel-like sealant to accomplish this. However, the effectiveness of dural sealants has come into question over the years. In 2011, a publication from Duke University reported an association between higher complication rates and the use of sealants and a specific type of graft material.

Now, a study from Columbus, Ohio has also found an association between dural sealants and specific complications in pediatric Chiari surgery. The surgical group noticed an increase in complications and first performed a retrospective analysis which looked at all the surgeries where the dura was opened between 2011-2018. They looked specifically for symptomatic pseudomeningocele (abnormal pocket of spinal fluid), aseptic meningitis (inflammation of the brain covering), bacterial meningitis, spinal fluid leak, hydrocephalus, surgical infection, and incision opening. Out of 110 surgeries, the overall complication rate was 24.5% and there was a correlation between the use of sealants and complications, with DuraSeal having the most complications, Tisseel the second most, and not sealant the least. The surgeons also noted that graft material was not related to complication rates.

Based on this finding, the group decided to change their surgical procedure and eliminate the use of DuraSeal. Going forward they then tracked another 40 pediatric surgeries and noted the overall complication rate was cut in half (12.5%). The drops in symptomatic pseudomeningocele and aseptic meningitis were especially significant. Even in this group, the complication rate for surgeries with a dural sealant (Tisseel) was higher (12.5%) compared to surgeries with no sealant (0%).

The surgeons would have liked to compare specific graft-sealant combinations, but there were not enough subjects in the study to do that effectively. Instead, they point out that would require a large, randomized, controlled clinical trial to see if certain combinations lead to high complication rates.

Source: Association between synthetic sealants and increased complication rates in posterior fossa decompression with duraplasty for Chiari malformations regardless of graft type. Makoshi Z, Toop N, Smith LGF, Drapeau A, Pindrik J, Sribnick EA, Leonard J, Shaikhouni A. J Neurosurg Pediatr. 2022 Sep 9:1-10.

Conquer Chiari's research updates highlight and summarize interesting publications from the medical literature while providing background and context. The summaries do contain some medical terminology and assume a general understanding of Chiari. Introductory information and many more research articles can be found at www.conquerchiari.org.