Complications following decompression of Chiari malformation Type I in children: dural graft or sealant?.

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Abstract:

OBJECT: Posterior fossa decompression with duraplasty for Chiari malformation Type I (CM-I) is a common pediatric neurosurgery procedure. Published series report a complication rate ranging from 3% to 40% for this procedure. Historically, many dural substitutes have been used, including bovine grafts, human cadaveric pericardium, synthetic dura, and autologous pericranium. The authors hypothesized that a recently observed increase in complications was dependent on the graft used.

METHODS: Between January 2004 and January 2008, 114 consecutive patients <= 18 years old underwent primary CM-I decompression using duraplasty. Records were retrospectively reviewed for short- and intermediate-term complications and operative technique, focusing on the choice of duraplasty graft with or without application of a tissue sealant.

RESULTS: The average age of the patients was 8.6 years. The dural graft used was variable: 15 were treated with cadaveric pericardium, 12 with Durepair, and 87 with EnDura. Tisseel was used in 75 patients, DuraSeal in 12, and no tissue sealant was used in 27 patients. The overall complication rate was 21.1%. The most common complications included aseptic meningitis, symptomatic pseudomeningocele, or a CSF leak requiring reoperation. The overall complication rates were as follows: cadaveric pericardium 26.7%, Durepair 41.7%, and EnDura 17.2%; reoperation rates were 13%, 25%, and 8.1%, respectively. Prior to adopting a different graft product, the overall complication rate was 18.1%; following the change the rate increased to 35%. Complication rates for

tissue sealants were 14.8% for no sealant, 18.7% for Tisseel, and 50% for DuraSeal. Nine patients were treated with the combination of Durepair and DuraSeal and this subgroup had a 56% complication rate.

CONCLUSIONS: Complication rates after CM-I decompression may be dependent on the dural graft with or without the addition of tissue sealant. The complication rate at the authors' institution approximately doubled following the adoption of a different graft product. Tissue sealants used in combination with a dural substitute to augment a duraplasty may increase the risk of aseptic meningitis and/or CSF leak. The mechanism of the apparent increased inflammation with this combination remains under investigation.