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Nowak et al., from Greifswald, analyzed the results using Hemopatch® as a new dural sealant after durotomy in cranial and spinal neurosurgical procedures.

In this prospective single center study, they analyzed all patients who received Hemopatch® used as a dural sealant between October 2016 and May 2017. 34 patients received Hemopatch® used as a dural sealant in the study period. They included 23 (67.6%) female and 11 (32.3%) male patients. The mean age was 56 years (4-83 years). They included emergency and elective surgical procedures as well as spinal and cranial intradural surgery. They did not exclude any type of underlying pathology. They took note of the general patient data, the size of Hemopatch® used, the type of dural closure, and the postoperative stay. Additionally, they recorded the type of dural closure (watertight/ watertight with additional muscle patch/ not watertight with small or large defect (>1 cm) remaining) and of preoperative hydrocephalus as well as intraoperative ventricular opening.

Hemopatch® was used in addition to the following dural closures: 11 (32.4%) watertight suture, 23 (67.6%) non-watertight suture. Three (8.8%) surgeries were emergency procedures. The site of surgery was as follows: 18 (52.9%) supratentorial, 16 (47.1%) infratentorial. A ventricular opening was performed in 13 (38.2%) cases. A hydrocephalus was present in 2 (5.9%) cases. A revision surgery after use of Hemopatch® was performed in 2 (5.9%) patients. Postoperative CSF fistulas and infections were observed in 2 patients each.

They could demonstrate the safety and efficiency of Hemopatch® used as dural sealant after durotomy in microneurosurgical procedures. To confirm our promising results a larger prospective randomized controlled trial will be needed [1)]

Cerebrospinal fluid leakage occurs in 4% to 32% of cranial surgeries and is associated with significant patient burden and expense. The use of sealant as an adjunct to primary dural closure is assumed to help prevent CSF leakage.

van Doormaal et al., evaluated 9 commonly used dural sealants, including Tachosil (Takeda Inc, Osaka, Japan), Adherus (Hyperbranch Inc, Durham, North Carolina), Duraform (Codman, Raynham, Massachusetts), Tissudura (Baxter, Deerfield, Illinois), Hemopatch (Baxter), TissuePatchDural (Tissuemed, Leeds, United Kingdom), Tisseel (Baxter), Duragen Secure (Integra, Plainsboro, New Jersey), and Duraseal, (Integra). Sealants were tested in 2 novel in Vitro setups using fresh porcine dura: the first tested the acute burst pressure of a sealed 3-mm gap, while the second examined resistance to a pressure wave mimicking intracranial pressure for 72 h.

Adherus showed the highest mean burst pressure (87 ± 47 mmHg) followed by Tachosil (71 ± 16 mmHg) and Duraseal (51 ± 42 mmHg); these were the only 3 sealants showing burst pressures above normal physiological intracranial pressure. In the 72-h setup, only Adherus and Duraseal maintained appropriate sealing for the duration of the experiment. Tachosil released from the dura after 1.4 h (95% confidence interval, -1.8-4.7).

Given the high cost of sealants and the results of this study, they advocate a critical attitude toward sealant application as an adjunct to classic dural closure [2)].

References

1)
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2)
van Doormaal T, Kinaci A, van Thoor S, Redegeld S, Bergmann W, van der Zwan A. Usefulness of Sealants for Dural Closure: Evaluation in an In Vitro Model. Oper Neurosurg (Hagerstown). 2018 Oct 1;15(4):425-432. doi: 10.1093/ons/opx260. PubMed PMID: 29281065.