Effect of fibrin glue on the prevention of persistent cerebral spinal fluid leakage after incidental durotomy during lumbar spinal surgery.

Authors: Jankowitz BT, Atteberry DS, Gerszten PC, Karausky P, Cheng BC, Faught R, Welch WC

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Abstract:

Approximately one million spinal surgeries are performed in the United States each year. The risk of an incidental durotomy (ID) and resultant persistent cerebrospinal fluid (CSF) leakage is a significant concern for surgeons, as this complication has been associated with increased length of hospitalization, worse neurological outcome, and the development of CSF fistulae. Augmentation of standard dural suture repair with the application of fibrin glue has been suggested to reduce the frequency of these complications. This study examined unintended durotomies during lumbar spine surgery in a large surgical patient cohort and the impact of fibrin glue usage as part of the ID repair on the incidence of persistent CSF leakage. A retrospective analysis of 4,835 surgical procedures of the lumbar spine from a single institution over a 10-year period was performed to determine the rate of ID. The 90-day clinical course of these patients was evaluated. Clinical examination, B-2 transferrin assay, and radiographic imaging were utilized to determine the number of persistent CSF leaks after repair with or without fibrin glue. Five hundred forty-seven patients (11.3%) experienced a durotomy during surgery. Of this cohort, fibrin glue was used in the dural repair in 278 patients (50.8%). Logistic models evaluating age, sex, redo surgery, and the use of fibrin glue revealed that prior lumbar spinal surgery was the only univariate predictor of persistent CSF leak, conferring a 2.8-fold increase in risk. A persistent CSF leak, defined as continued drainage of CSF from the operative incision within 90 days of the surgery that required an intervention greater than simple bed rest or over-sewing of the wound, was noted in a total of 64 patients (11.7%). This persistent CSF leak rate was significantly higher ($P < 0.001$) in patients with prior lumbar surgery (21%) versus

those undergoing their first spine surgery (9%). There was no statistical difference in persistent CSF leak between those cases in which fibrin glue was used at the time of surgery and those in which fibrin glue was not used. There were no complications associated with the use of fibrin glue. A history of prior surgery significantly increases the incidence of durotomy during elective lumbar spine surgery. In patients who experienced a durotomy during lumbar spine surgery, the use of fibrin glue for dural repair did not significantly decrease the incidence of a persistent CSF leak.