

# **New technique for application of fibrin sealant: Rubbing method devised to prevent cerebrospinal fluid leakage from dura mater sites repaired with expanded polytetrafluoroethylene surgical membranes.**

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## **Abstract:**

**OBJECTIVE:** The effectiveness of a strong, pressure-tight method for fibrin sealant application was experimentally and clinically evaluated, using expanded polytetrafluoroethylene (ePTFE) surgical membranes. **METHODS:** Two application methods were examined in two groups. For Group 1, 1 ml each of Solutions A and B was simply sprayed over the surface (spray method). For Group 2, a small amount of Solution A was rubbed into the sutured site and then Solutions A and B were sprayed over the surface (rubbing method). In the experimental study, a moment pressure elevation test and a continuous stepwise pressure elevation test were performed for both groups. The clinical study was conducted using 350 patients undergoing craniotomies. The ePTFE surgical membrane was used for 180 patients but not the other 170 patients. **RESULTS:** In the experimental study, the bursting pressures were  $51.4 \pm 13.0$  cm H<sub>2</sub>O for Group 1 and  $129 \pm 35.0$  cm H<sub>2</sub>O for Group 2 in the moment pressure elevation test and  $27.0 \pm 6.7$  cm H<sub>2</sub>O and  $100 \pm 31.9$  cm H<sub>2</sub>O, respectively, in the continuous stepwise pressure elevation test. The sealing effect was significantly greater for Group 2 than for Group 1 in both tests ( $P < 0.001$ ). In the clinical study using ePTFE surgical membranes, the rubbing method significantly reduced the incidence of postoperative cerebrospinal fluid leakage (1.4%), compared with the spray method (18.3%), when external decompression was not concomitantly used ( $P < 0.01$ ). **CONCLUSION:** The sealing effect of fibrin sealant on cerebrospinal fluid leakage was significantly greater with the rubbing method than with the spray method. The strong sealing effect

obtained with the rubbing method is thought to result from firm linkage between the ePTFE surgical membrane and the fibrin sealant and also from fibrin being formed even in needle holes and spaces in the sutured site.