Fibrin glue and polyglycolic acid nonwoven fabric as a biocompatible dural substitute.

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Abstract:

OBJECTIVE: A novel biocompatible dural substitute created using fibrin glue and polyglycolic acid nonwoven fabric was examined for closing ability and histology. METHODS: A rabbit skin model of dural defect was repaired using fibrin glue-covered polyglycolic acid fabric without suture and subjected to a water leakage test to investigate closing ability. In addition, the dural defects created on 12 hemispheres in 6 beagle dogs were repaired with the dural substitute and subjected to macroscopic and histological examination of the dural substitute and adjacent tissue 1 and 2 months later. RESULTS: The dural substitute showed a breaking pressure of 109.9 +/- 37.1 mmHg. Macroscopically, no cases of excessive granulation, infection, or liquorrhea, either on the dural substitute or surrounding tissue, were observed. Histology indicated favorable tissue replacement of the dural substitute with collagenous fiber, although slight foreign body reaction was associated with its absorption. There was no evidence for adhesion to the brain surface or influence on nerve cells. CONCLUSION: Dural substitute created using fibrin glue and polyglycolic acid fabric is advantageous in that it exerts excellent closing ability without requiring suture and can replace biological tissue without causing incompatibility.