# Absorption and formation of granuloma of fibrin glue applied on the human dura mater: Histological examination of specimens obtained by second craniotomy. [Japanese]

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## Abstract:

Aerosolized fibrin glue has been widely applied on neurosurgery to prevent cerebrospinal fluid leakage through dural sutures. This study describes processes of absorption of fibrin clot used on the dura mater. Six specimens of fibrin clot were obtained by second surgery 11 up to 285 days after the first surgery. Approximately 2 weeks after the surgery, a membranous fibrin clot was partially dissolved and absorbed by densely infiltrating inflammatory cells. The cells were predominantly neutrophils, and in part macrophages. A specimen pulled apart from the autologous dura mater 4 weeks after the surgery was replaced with fibrous connective tissue composed with loose collagen fiber networks. Lymphocytes migrated in place of phagocytes. Infiltration and proliferation of fibroblasts were seen and endothelial cells formed small vessels. In part, however, fibrin clot remained. The vascular connection was observed between the granuloma and the dura mater. After 10 months, fibrin clot was replaced with mature granuloma composed of collagenous connective tissue with scarce eosinophil migration. On the other hand, fibrin glue sprayed on a processed human dura mater was hardly resolved compared to that on autologous dura and remained as a fragile membranous clot after 1 weeks or later. It was speculated that a clot resolution preceding to a granuloma formation may induce delayed cerebrospinal fluid leakage, especially on the non vascularized artificial dura mater.