

Tensile strength of biological fibrin sealants: a comparative study.

Authors: Lacaze L, Le Dem N, Bubenheim M, Tsilivlidis B, Mezghani J, Schwartz L, Francois A, Ertaud JY, Bagot d'Arc M, Scotte M

Publication Date: 2012

Abstract:

BACKGROUND: Fibrin sealants are commonly used in liver surgery, although their effectiveness in routine clinical practice remains controversial. Individual sealant characteristics are based on hemostatic effects and adhesion properties that can be experimentally measured using the 'rat skin test' or the 'pig skin test'. This study used a more relevant and realistic experimental canine model to compare the differences in the adhesive properties of four fibrin sealants in hepatectomy: Tisseel/Tissucol, Tachosil, Quixil, and Beriplast.

MATERIALS AND METHODS: A partial hepatectomy was performed in beagle dogs under general anesthesia to obtain liver cross-sections. Fibrin sealants were allocated to dog livers using a Youden square design. The tensile strength measurement was performed using a traction system to measure the rupture stress point of a small wooden cylinder bonded to the liver cross-section.

RESULTS: Significantly greater adhesion properties were observed with Tisseel/Tissucol compared with Quixil or Beriplast ($P = 0.002$ and 0.001 , respectively). Similarly, Tachosil demonstrated significantly greater adhesive properties compared with Beriplast ($P = 0.009$) or Quixil ($P = 0.014$). No significant differences were observed between Tisseel/Tissucol and Tachosil or between Beriplast and Quixil.

CONCLUSIONS: The results of this comparative study demonstrate that different fibrin sealants

exhibit different adhesive properties. Tisseel/Tissucol and Tachosil provided greatest adhesion to liver cross-section in our canine model of hepatectomy. These results may enable the optimal choice of fibrin sealants for this procedure in clinical practice.

Copyright © 2012 Elsevier Inc. All rights reserved.