

# **Effectiveness of autologous fibrin sealant in experimental lung surgery.**

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## **Abstract:**

A controlled study was performed to evaluate the effectiveness and biocompatibility of ethanol-prepared fibrin sealant for closure of an experimental pulmonary air leak in pigs. The sealant was based on co-administration of fibrinogen concentrate prepared from plasma by ethanol precipitation and thrombin solution. Standardized wedge resections were created bilaterally in the lungs of 5 pigs and sutured on both sides. The lungs were randomized for treatment with fibrin glue or as a control no sealant. Chest tubes were inserted and the volume of leaked air measured at regular intervals for 2 h after sealant application. In 3 pigs, survival studies were performed to assess the persistence and biocompatibility of the glue. The sealant, prepared either from human plasma or autologous pig plasma, was instilled onto the intact pleura through a thoracoscope. Histological examination of the clots was performed after 3, 7 and 21 days. The mean air leak from the fibrin-sealed lungs was 16 ml/min versus 213 ml/min from the control lungs. The reduction in air leak averaged 92% (95% confidence interval, 74-99%). Infiltration with cells was seen early, and fibroblasts were proliferating after 7 days. At 21 days, the clots were organized and partly resorbed. No differences were seen between the cellular reactions to human or porcine fibrin sealant. In conclusion, air leak after experimental lung surgery was significantly reduced by the use of fibrin glue prepared from plasma. The fibrin sealant appeared to be biocompatible and to function as a scaffold for cell growth. The glue is suitable for autologous use in humans.