

The sealing effect of fibrin glue against alveolar air leakage evaluated up to 48 h; Comparison between different methods of application.

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Abstract:

Objective: There is little experimental evidence to show how much positive airway pressure fibrin sealants can actually withstand, and in particular, how this effect changes over time. In the present study, we experimentally evaluated the sealing effect of fibrin glue against alveolar air leakage up to 48 h after application. **Methods:** Beagles were used (n=48). Under thoracotomy, approximately 5x10 mm defects (2 mm depth) were made on the lung surface. Fibrin glue sealants were applied to this defect in three ways. In rubbing and spray method, fibrinogen was rubbed, followed by spraying of both fibrinogen and thrombin solutions. In double layer method, fibrinogen was dripped, followed by thrombin. Collagen fleece, coated with fibrinogen and thrombin (TachoComb) was also tested. The minimum positive airway pressure which produced air leakage was measured for each sealed defect (seal breaking pressure, cmH₂O) at 0, 3, 6, 12, 24, and 48 h after application (n=6 at each time point). **Results:** The seal-breaking pressure increased over time in all of the application methods. At 6 h, differences between methods were not significant but three defects in RS reached 70 cmH₂O, the maximum pressure tested, compared with none in other two methods. At 12 h, the seal-breaking pressure was significantly higher in RS compared with the other two methods (rubbing and spray method vs TachoComb; 66±3 vs 47±17, P=0.047, rubbing and spray method vs double layer method; 66±3 vs 42±18, P=0.024). Beyond 24 h, sealing pressure reached close to 70 cmH₂O in all the methods. **Conclusions:** The results show that the sealing effect of fibrin glue is relatively unstable up to 12 h after its application. Rubbing and spray method may help the fibrin seal to reach its full strength faster compared with the other two

