

The short-term efficacy of fibrin glue combined with absorptive sheet material in visceral pleural defect repair.

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Abstract:

Tissue sealants can prevent the occurrence of pulmonary air leakage, although few studies have evaluated the seal-breaking pressure properties of the various methods. We developed a new method for repairing visceral pleural defects which combines fibrin glue with a sheet material. We used an animal model to compare its efficacy with that of three current techniques up to 24 h after application. Under thoracotomy, 5 x 20 mm visceral pleural defects with a depth of 3 mm were made in beagles. The defects in the normal lungs were repaired using 1 of 4 methods: Method A, fibrin-glue double layer (fibrinogen solution was dripped, followed by thrombin solution); Method B, pack method (fibrin glue combined with polyglycolic acid sheet); Method C, rubbing and spray (fibrinogen was rubbed, followed by spraying of both fibrinogen and thrombin solutions); Method D, fibrin-glue-coated collagen fleece. The defects were repaired also in an emphysematous lung model using Method A, B or C. In the normal lungs, Method B showed significantly higher pressure resistance compared with the other methods at 5 min, 1 and 3 h post-application. Pressure resistance increased with time for all methods. In the emphysematous lungs, Method B showed significantly higher seal-breaking pressure than Methods A and C. Compared with existing tissue sealant methods, the pack method reliably controlled pulmonary air leakage immediately after application. © 2007 Published by European Association for Cardio-Thoracic Surgery. All rights reserved.