Laser bonding of secondary bronchi with solvent--detergent-treated cryoprecipitate.

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Abstract:

Management of bronchopleural fistula is a challenging clinical problem. Laser-assisted cryoprecipitate bonding techniques offer a means to fix precisely tissue glues into the fistulae through a bronchoscopic approach. Analogous studies exist using fibrin glue with thrombin. Using a canine model, secondary bronchi were sealed with cryoprecipitate made from solvent/detergent-treated plasma (treated to inactivate membrane-enveloped virus) mixed with indocyanine green (absorption 805 nm). Diode laser energy (emission 808 nm, 7.3 W/cm 2) was applied to the solder until dessication was observed. Leakage pressures (n = 7) ranged between 18 and 86 mmHg with a mean of 46 +/- 24 mmHg. Laser-assisted solder techniques provide a reliably strong seal over leaking bronchial stumps and use of dye enhancement prevents undesired collateral thermal injury to surrounding bronchial tissue. Solvent/detergent plasma, prepared by methods shown to inactivate large quantities of HIV, HBV, and HCV, is an effective source of cryoprecipitate and should allow widespread use of pooled human material in a clinical setting.