Evaluation of acute fixation strength for mechanical tacking devices and fibrin sealant versus polypropylene suture for laparoscopic ventral hernia repair.

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Abstract:

BACKGROUND: The purpose of this comparative study is to evaluate the acute fixation strength of mechanical tacking devices and fibrin sealant against polypropylene suture for laparoscopic ventral hernia repair.

METHODS: Three metallic mechanical tacking devices (ProTack, Salute, EndoANCHOR), 4 absorbable tacking devices (AbsorbaTack, PermaSorb, I-Clip, and SorbaFix), and 2 types of fibrin sealant (Tisseel, Artiss) were compared with 0-polypropylene suture. Three constructs from each device or an amount of sealant sufficient to cover a 3 x 3 cm(2) area were used to affix a 4 x 3 cm piece of absorbable barrier-coated mesh (Proceed, Ethicon, Inc) to the peritoneal surface of porcine abdominal wall. Ten samples were completed for each fixation modality. Acute fixation strength was measured via a lap shear test on an Instron tensiometer.

RESULTS: Acute fixation strength was significantly greater for suture (59.7 7.2 N) compared with all laparoscopic tacking devices and to fibrin sealant ($P < .001$ for all comparisons). Protack (29.5 +/- 2.8 N) was stronger than Absorbatack (13.2 +/- 3.7 N; $P = .029$). Protack, Permasorb, SorbaFix, and I-clip were stronger than fibrin sealant ($P < .05$ for all comparisons).

CONCLUSIONS: The acute fixation strengths of metallic or absorbable tacks as well as fibrin sealant are all significantly less than that achieved with polypropylene suture. These factors should be considered in selecting the type of mechanical fixation for patients undergoing laparoscopic ventral hernia repair.