Biomechanical comparison of fibrin adhesives for mesh fixation.

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Abstract:

Background: Adhesive use for fixation in hernia repair allows for complete and immediate mesh surface area adherence. This technique for hernia repair is gaining wider acceptance, however little is known about the relative fixation strengths of the multiple products and application methods available. The purpose of this study was to compare the immediate and early strength of fixation of TisseelTM and EvicelTM using hand and spray application techniques. Methods: 16 Mongrel swine underwent implantation of four 4 x 7 cm pieces of large pore, mid-weight polypropylene mesh fixated with either 2 mL of TisseelTM or EvicelTM, applied either by hand or with the manufacturer supplied spray apparatus. Time points studied were 0 and 4 days. All samples underwent lap shear testing to quantify the strength of the mesh-tissue interface as an indicator of mesh fixation strength. Results: 30 Day 4 and 16 Day 0 samples were tested. Manually applied TisseelTM mean fixation strength was 2.05 N/cm (+/-STE 0.89) at Day 0 and 6.02 N/cm at Day 4. Sprayed TisseelTM had mean fixation strength of 1.22 N/cm (+/-STE 0.06) at Day 0 and 7.21 N/cm (+/-STE 0.65) at Day 4. Manually applied EvicelTM showed mean fixation strength of 0.92 N/cm (+/-STE 0.15) at Day 0 and 6.73 N/cm (+/-STE 0.70) at Day 4. Mean fixation strength of sprayed EvicelTM was 0.72 N/cm (+/-STE 0.04) at Day 0 and 6.70 N/cm (+/-STE 0.57) at Day 4. Analysis of variance testing showed no difference between groups at Day 0 or Day 4. Conclusions: Immediate strength of mesh fixation is an undescribed factor in hernia repair, but could have significant implications for early recurrence and mesh contraction. This study demonstrates that no difference exists in immediate or early mesh fixation strength between these two brands of adhesives or their method of application.