

Biomechanical properties of (semi-) synthetic glues for mesh fixation in endoscopic inguinal hernia repair.

Authors: Schug-Pass C., Jacob D.A., Rittinghausen J., Lippert H., Kockerling F.

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Abstract:

Purpose: In endoscopic inguinal hernia repair, the use of fibrin glues for mesh fixation instead of staples and sutures can demonstrably reduce postoperative morbidity without increasing the recurrence rate. Various fibrin glues differ in terms of their mesh fixation strength. As an alternative to fibrin glue, there is an increasing trend toward using synthetic glues for mesh fixation in both open and endoscopic inguinal hernia surgery. To date, no studies have been conducted comparing the fixation strength of (semi-) synthetic glues with that of fibrin glues. Here, using a biomechanical model, we compared the adhesive strength of two glues (BioGlue and Glubran) used in surgery with a fibrin glue. **Methods:** We used light-weight polypropylene meshes (TiMesh light). In each case, the biomechanical stability of five meshes in each group was tested with 2 ml fibrin glue (Evicel), 2 ml BioGlue or 2 ml Glubran (cyanoacrylate). The defect in the muscle tissue used was 4.5 cm in diameter for a mesh size of 10 x 15 cm. Measurements were taken using a standardized stamp penetration test while aiming not to remain under a minimum fixation strength of 32 N. **Results:** Using Evicel for mesh fixation, an adhesive strength of 64.3 N was achieved. This was significantly greater than that obtained in the absence of fixation (2.9 N, $p < 0.001$) and higher than the requisite value of 32 N. Using Glubran, it was possible once again to significantly improve the adhesive strength (105.4 N, $p = 0.008$). The use of BioGlue improved the adhesive strength to 131.7 N, but not significantly so compared with Glubran ($p = 0.110$). **Conclusions:** In terms of adhesive strength, (semi-) synthetic glues can be used for mesh fixation instead of fibrin glue and even achieve significantly better adhesive strength than fibrin glue. However, further clinical studies are needed to

identify the role of (semi-) synthetic glues compared with fibrin glues in endoscopic inguinal hernia surgery. © 2012 Springer-Verlag France.