

Fixation of mesh to the peritoneum using a fibrin glue: Investigations with a biomechanical model and an experimental laparoscopic porcine model.

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Abstract:

Background: In recent years, the use of fibrin glue has become an established practice in several areas of surgical treatment. For example, fibrin glue is used increasingly as an alternative method for mesh fixation in hernia surgery, significantly helping to reduce the incidence of chronic pain. The experiments in this study were aimed at elucidating the extent to which tack- or suture-based permanent fixation can be replaced by fixation with fibrin glue for laparoscopic intraperitoneal repair of abdominal wall hernias. **Methods:** In an initial series of experiments conducted with a biomechanical model, the strength of the fibrin glue for fixation of lightweight mesh (TiMesh light) to muscle tissue was compared with its strength of fixation to the peritoneum. In a second series of experiments, mesh was laparoscopically implanted in an established porcine model. Fibrin glue was used for mesh fixation in six animals. Laparoscopic exploration and explantation of the meshes were conducted after 4 months. Planimetric analysis was performed to investigate adhesion and shrinkage of the mesh surface. **Results:** The strength of fibrin glue for fixation of mesh to the peritoneum was significantly less than for its fixation to muscle tissue (11.86 N vs. 47.88 N; $p = 0.001$). Three of the implanted meshes were not completely integrated, and two of these were dislocated. On the average, adhesions were seen on 16% of the mesh surfaces. The mesh shrinkage rate was 24.2%. **Conclusion:** Mesh fixation alone to the undamaged peritoneum in the intraperitoneal region cannot be recommended because of the risk for dislocation. Additional fixation using sutures, tacks, or both is needed until the mesh material is completely integrated. © 2009

