A comparison of a bovine albumin/glutaraldehyde glue versus fibrin sealant for hernia mesh fixation in experimental onlay and IPOM repair in rats.

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Abstract:

Background: Research in hernia repair has targeted new atraumatic mesh fixation to reduce major complications such as chronic pain and adhesion formation. The efficacy and safety of two surgical adhesives, viz. Artiss (FS, fibrin sealant containing 4 IU thrombin) and Bioglue (AGG, bovine serum albumin/glutaraldehyde glue), were evaluated in this study. Primary study endpoints were tissue integration, dislocation, and adhesion formation. Foreign-body reaction formed the secondary study endpoint. Methods: Twenty-four polypropylene meshes (VM, Vitamesh) were randomized to four groups (n = 6): two groups of onlay hernia repair (two meshes per animal) with mesh fixation by FS (O-FS) or by AGG (O-AGG), and two groups of IPOM repair (one mesh per animal) with mesh fixation by four sutures and FS (I-FS) or AGG (I-AGG). Eighteen rats underwent surgery. Follow-up was 30 days. Tissue integration, dislocation, seroma formation, inflammation, adhesion formation, and foreign-body reaction were assessed. Results: Meshes fixed with FS (O-FS, I-FS) showed good tissue integration. No dislocation, seroma formation, or macroscopic signs of inflammation were detectable. Adhesion formation of I-FS was significantly milder compared with I-AGG (P = 0.024). A moderate foreign-body reaction without active inflammation was seen histologically in O-FS and I-FS groups. Samples fixed with AGG (O-AGG, I-AGG) showed extensive scar formation. No dislocation and no seroma formation were observed. All of these samples showed moderate to severe signs of inflammation with abscess

formation in the six meshes of O-AGG. Histology underlined these findings. Conclusions: The fibrin sealant adhesive showed very good overall results of the primary and secondary outcome parameters. FS is a recommendable atraumatic fixation tool for the surgical onlay technique. AGG provides high adhesive strength, but shows low biocompatibility. Persisting active inflammation was seen in both the O-AGG and I-AGG groups, not favoring its use for these indications.