

Fibrin-thrombin coated sealant increases strength of esophagogastric anastomoses in a rat model.

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Abstract:

Background: Anastomotic leakage is a feared complication after esophagectomy. The purpose of this study was to investigate whether the use of a fibrin-thrombin coated collagen patch (TachoSil; Nycomed, Zurich, Switzerland), applied as a sealant, would strengthen the esophagogastric anastomosis and stimulate anastomotic healing in a rat model. Methods: Hand sewn, end-to-side esophagogastric anastomoses were performed in 54 rats. Animals were randomized for an unsealed or sealed anastomosis. Rats were sacrificed on postoperative d 0, 3, 5, and 7. Primary parameter was bursting pressure. Secondary outcomes were complications, weight, and immunohistochemical staining for collagen formation and fibroblast activity. Results: Bursting pressure at d 0 and 3 was significantly increased when a sealant was used (55.1 \pm 4.6 mmHg versus 102.4 \pm 7.3 mmHg, $P < 0.010$; and 19.7 \pm 3.3 mmHg versus 34.6 \pm 4.9 mmHg, $P < 0.050$ respectively). There was no difference in bursting pressure at d 5 and 7 between unsealed and sealed anastomoses (60.9 \pm 18.2 mmHg versus 53.4 \pm 6.6 mmHg, $P = 0.690$; and 118.8 \pm 20.2 mmHg versus 97.2 \pm 8.3 mmHg, $P = 0.374$ respectively). Application of sealant independently influenced bursting pressure ($P < 0.010$). Increased fibroblastic activity was noticed at d 7 in sealed anastomoses ($P < 0.050$). There were no differences in weight gain between groups. Conclusions: Additional sealing of the anastomosis increased anastomotic strength during early postoperative recovery when anastomotic strength is at its weakest. The findings indicate that sealing of the anastomosis has the potential to prevent leakage after esophagectomy in humans. © 2012 Elsevier

