

# Sealing effect of fibrin glue on the healing of gastrointestinal anastomoses: Implications for the endoscopic treatment of leaks.

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## Abstract:

Background: The adoption of advanced laparoscopic techniques for complex surgical procedures has raised the concern that the leak rate might be higher than for open surgery, particularly in the surgeon's early experience or in difficult cases. In this study, the sealing effect of fibrin glue on leaking gastrointestinal anastomoses was evaluated in an experimental swine model. Methods: A standardized gastrojejunostomy was performed on 20 female pigs (mean weight, 47.7 +/- 5.7 kg). A leak was created on the anterior surface of the anastomosis. The animals were randomized to either fibrin glue or no treatment of the leak. Clinical conditions and vital signs, including body temperature, heart rate and, respiratory rate, were collected three times a day. Preoperative and postoperative complete and differential blood count and lactate dehydrogenase levels were determined. Postmortem analysis was performed when the animals were killed. Results: Clinical signs of peritonitis developed in the control animals by the second or third postoperative day. Findings that confirmed the presence of an anastomotic leak at the postmortem examination were the presence of food or gastrojejunal juices in the abdominal cavity, a localized abscess, or a positive air leak test. Fibrin glue treatment prevented the development of peritonitis in all the animals. Complete sealing of the leak was observed on postoperative day 7 in all treated animals, except one in which an asymptomatic contained leak developed. The postoperative total white blood count was significantly increased in the untreated group (24.69 +/- 5.5 vs 12.74 +/- 3.7  $10^3$ /ul p < 0.001, paired t-test), as compared with the treated group (15.55 +/- 2.4 vs 14.89 +/- 2.7  $10^3$ /ul; p = 0.24). Conclusion: In this study, fibrin glue showed reproducible sealing

effects on leaking gastrojejunal anastomoses. Fibrin glue application may be a valuable approach for the treatment of gastrointestinal anastomotic leaks. © Springer Science+Business Media, Inc. 2004.