The efficacy of fibrin sealant in prevention of anastomotic leak after laparoscopic gastric bypass.

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Abstract:

BACKGROUND: Anastomotic leak after laparoscopic gastric bypass (GBP) can result in significant morbidity, mortality, and consumption of healthcare resources. Fibrin sealant has been used clinically in the prevention of leak; however, its efficacy has not been clearly demonstrated. The aims of this study were to (1) develop an iatrogenic leak model in swine, (2) examine the efficacy of fibrin sealant in sealing iatrogenic anastomotic leak, and (3) review our experience with the use of fibrin sealant in 66 patients who underwent laparoscopic GBP.

METHODS: This study was performed in three phases. In phase 1, laparoscopic gastrojejunostomy was performed in adult swine with iatrogenic disruption of the anastomotic staple line. The size of disruption was sequentially increased (6- to 12-F opening) until a leak model was developed. In phase 2, 16 animals underwent laparoscopic gastrojejunostomy with a 12-F disruption of the anastomosis; 10 animals (study group) had fibrin sealant (Tisseel VH) applied on the disrupted anastomosis and 6 animals (control group) did not receive fibrin sealant. Animals were sacrificed on postoperative day 5 or earlier if peritonitis developed and were examined for sealing of the anastomotic disruption and the presence of intraabdominal abscess. In phase 3, the outcome of 66 consecutive patients who underwent laparoscopic GBP with fibrin sealant applied at the gastrojejunostomy was reviewed.

RESULTS: In phase 1, an anastomotic leak model was developed with a 12-F disruption of the

staple line. In phase 2, two control animals required early sacrifice for bile peritonitis; three control animals had intraabdominal abscess discovered at sacrifice and one animal did not have any evidence of intraabdominal abscess or leak. Of the 10 animals in the study group, all survived until sacrifice and none of these animals had evidence of intraabdominal abscess or persistent leak. Therefore, 83% of animals in the control group developed either leak or abscess compared to 0% in the study group ($P < 0.01$, Fisher's exact test). Clinically, no leak or intraabdominal abscess developed in 66 patients who underwent laparoscopic GBP with the use of fibrin sealant.

CONCLUSIONS: An anastomotic leak model was developed in swine with disruption of the stapled gastrojejunostomy to a 12-F opening. The use of fibrin sealant significantly reduces leak and abscess complication. Our results support the tissue sealing property of fibrin sealant and its use on high-risk gastrointestinal anastomosis.