

Use of Fibrin Sealant (Tissucol/Tisseel) in Manual and Stapled Anastomoses

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Abstract

We present a study on the use of a human fibrin sealant (Tissucol) to prevent anastomotic dehiscence in digestive surgery. The study evaluates:

1. the appropriate modality of application of Tissucol,
2. the intraoperative leakage rate before and after application of Tissucol, and
3. the postoperative leakage rate in 42 patients with gastrointestinal anastomosis.

The results show 25% minor leaks in 32 colorectal and esophagojejunal anastomoses before application of Tissucol and no leaks after application of Tissucol. We conclude in favor of the use of Tissucol in high-risk manual or stapled anastomoses.

Introduction

25% minor leaks in 32 colorectal and esophagojejunal anastomoses

Anastomotic leakage is the most feared complication after gastrointestinal (GI) surgery, because it is the leading cause of morbidity and mortality in the postoperative course. Despite the advancement in technique and suture materials, anastomotic dehiscence remains a troublesome aspect of esophageal and colorectal anastomoses as well as pancreatic and biliary tract reconstructions [3, 5]. More than 50% of mortality after esophageal surgery is directly related to anastomotic leakage [1, 6, 8, 11, 14]. In colorectal surgery clinically important dehiscences occur in 4–8% of cases [2, 12] while the total number of anastomotic leakages could reach 50% [3, 5].

The use of staplers has not reduced the incidence of anastomotic dehiscences significantly. On a collected series of 3594 anastomoses performed with the EEA stapler, 352 were also found (9.8%) [13]. In the series reported by Graffner [4] the incidence of clinical dehiscences varied from 0% to 14%, while subclinical or radiological leakages were estimated at from 10% to 42%.

The causes of anastomotic dehiscence have been well described, and among them cachexia, local and generalized sepsis, cancer, malnutrition and technical mistakes have been emphasized. While large anastomotic leakages usually lead to severe clinical pictures of grave prognosis, limited leakages, which are probably very frequent, go unrecognized most of the time. Nevertheless microabscesses and phlogosis can result from small dehiscences, resulting in formation of adhesions and possible obstruction. In this respect the use of a human sealant (Tissucol) seems to offer a real advantage. Here we report on our experience during the past 2 years with the use of Tissucol in gastrointestinal anastomoses in GI surgery.

Material and Methods

A pilot study was undertaken to evaluate:

1. The appropriate method of application of Tissucol
2. The intraoperative leakage rate after application of Tissucol to the anastomoses
3. The postoperative leakage rate of GI anastomoses before and after application of Tissucol

During a 48-month period, 42 GI anastomoses were routinely performed: 16 manual colorectal anastomoses, 12 stapled colorectal anastomoses, 4 esophagojejunal stapled (EEA) anastomoses following total gastrectomy, 8 "Roux-en-Y" hepaticojejunostomies, and 2 pancreaticojejunostomies following the Whipple procedure. We have used a thrombin concentration of 500 IU/ml to obtain a clot within 10 s and therefore achieve a maximum hemostatic potential [7]. The Tissucol therm device has been used for the preheating and reconstitution of the components. After the application of Tissucol the anastomosis was isolated until the clot was firm and not adherent. The same method was used after stapled anastomoses; we used Tissucol only when its application on the stumps before stapling was unnecessary [10].

Result

The application of Tissucol on the completed anastomoses was simple and required an average of 10 min. The use of the Duploject is simple and effective. The complete coverage of the anastomosis was somewhat difficult after hepaticojejunostomy and esophagojejunostomy.

Colorectal and esophagojejunal anastomoses were all tested with diluted methylene blue solution introduced in the rectum or esophagus after the completion of the anastomosis. Minor leaks were present in 8 out of 32 anastomoses (25%) which were sealed off with silk sutures and application of Tissucol. None of anastomoses leaked after the application of Tissucol.

Postoperatively a meglumine diatrizoate (Gastrografin) contrast study was obtained in all the esophagojejunostomies and colorectal anastomoses between the fifth and tenth postoperative day. No leaks were visualized on both upper and lower anastomoses.

One out of 42 patients showed clinical evidence of anastomotic leakage after the Whipple procedure. Pancreatic juice was present for 6 days at the site of the left flank drain.

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2.4% leaks (1 patient out of 42)

the use of Tissucol. All operative day.

Conclusion

Our pilot study convinced us that the use of Tissucol has some definite advantages in GI tract surgery and specifically:

1. It is easy to use and the technique can be learned quickly.