Technical Note

A simple method for tension-free Billroth I anastomosis after gastrectomy for gastric cancer

You Na Kim[1], Mohammad Aburahmah[1,2], Woo Jin Hyung[1], Sung Hoon Noh[1]

[1]Department of Surgery, Yonsei University Health System, Yonsei University College of Medicine, Seoul, Korea; [2]Department of Surgery, King Faisal Specialist Hospital and Research Centre, Alfaisal University College of Medicine, Riyadh, Saudi Arabia

Correspondence to: Sung Hoon Noh, MD. Department of Surgery, Yonsei University College of Medicine, 50 Yonsei-Ro, Seodaemun-gu, 120-752, Seoul, Korea. Email: sunghoonn@yuhs.ac.

Abstract: Billroth I anastomosis (B-I) is a popular reconstructive procedure performed after distal gastrectomy for the treatment of gastric cancer. Herein we introduce a new and simple technique to minimize tension after Billroth I for gastric cancer.

Keywords: Billroth I anastomosis (B-I); gastrectomy; gastric cancer; gastro-phrenic ligament

Received: 03 January 2017; Accepted: 18 April 2017; Published: 24 May 2017.
doi: 10.21037/tgh.2017.05.08
View this article at: http://dx.doi.org/10.21037/tgh.2017.05.08

Introduction

Billroth I anastomosis (B-I), or gastroduodenostomy, is a popular reconstructive procedure performed after a distal gastrectomy for the treatment of gastric cancer. The advantages of B-I include simplicity, the maintenance of physiological food passage, and the retention of iron metabolism after distal gastrectomy (1,2). Because tension at the anastomotic site is a major cause of post-operative leaking, most of surgeons perform Kocher's maneuver to decrease tension after B-I. However, sometimes Kocher's maneuver alone does not adequately decrease the tension. Herein we introduce a new, simple technique to minimize tension after B-I for gastric cancer.

Methods

The B-I was performed by the modified double stapling technique, which we previously reported (3). With a 15 cm upper midline incision, total omentectomy and lymph node dissection were conducted. After transecting the duodenum, B-I was performed with CDH 29 (Ethicon, Inc. Cincinnati, OH) through the 3–4 cm length entry hole in the stomach. Then the stomach was transected by a linear stapler (GIA 100, Auto Suture Co., Norwalk, CT) with 3 to 5 cm of proximal margin, thus completing the B-I.

To decrease tension between duodenum and remnant stomach (the anastomotic site), the Kocher's maneuver was performed. To achieve minimized tension in the anastomosis site, the gastro-phrenic ligament, located contralateral of where Kocher's maneuver was performed, was incised at the left edge of the fundus of the stomach. The stomach was mobilized in the right distal direction (*Figure 1*). We have called it Noh's maneuver.

Discussion

B-I, Billroth II, and Roux-en-Y reconstructions are commonly performed after distal gastrectomy for gastric cancer, but it remains unclear which reconstructive method is best (4,5). Thus, many surgeons perform B-I because of its previously mentioned advantages (1,2). Anastomosis leak is a complication that surgeons wish to avoid, and tension at the anastomotic site is one of the primary causes for this leak. A traditional approach for decreasing tension after B-I for gastric cancer is Kocher's maneuver. The effect of mobilizing the duodenum is a decrease in tension when the patient stands upright because of the effect of gravity. The Noh's maneuver adds further mobilization of the fundus by dividing the gastro-phrenic ligament and releasing tension, making the stomach to drop not only toward duodenum but also in the direction of gravity. Thus, this new and simple method

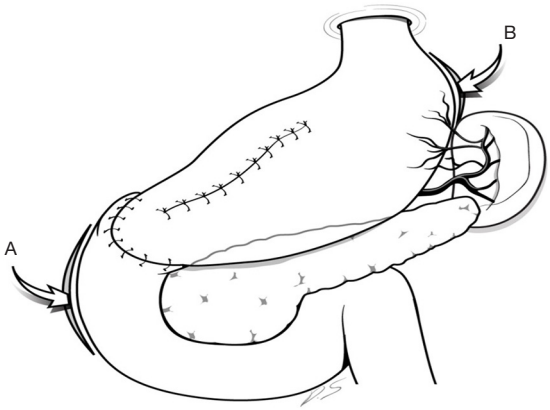

Figure 1 Illustration of gastroduodenostomy after distal gastrectomy for gastric cancer. (A) Kocher's maneuver; (B) Noh's maneuver. The gastro-phrenic ligament, located contralateral from the Kocher's maneuver, was divided.

can further minimize the tension at the anastomotic site.

Dividing the gastro-phrenic ligament is easy to perform and requires very little time, but there are cautionary notes. Surgeons should be careful not to injure the inferior phrenic vessels around gastro-phrenic ligament. Inferior phrenic vessels are some of the major vessels to supply the remnant stomach after distal gastrectomy. Thus, injuring these vessels would cause ischemia of the remnant stomach. Also some worry about the gastro-esophageal reflux. However, in our experience of over 60 cases of B-I in the past 6 months, we have performed the Noh's maneuver to transect the gastro-phrenic ligament after distal gastrectomy in gastric cancer patients, and we have had no incidence of inferior phrenic vessel injury and no patients were suffered from gastro-esophageal reflux.

We developed the Noh's maneuver to further reduce tension after B-I reconstruction and Kocher's maneuver, thus reducing the patient's risk of anastomosis leak. We believe the Noh's maneuver will be helpful to surgeons who perform B-I after distal gastrectomy.

doi: 10.21037/tgh.2017.05.08
Cite this article as: Kim YN, Aburahmah M, Hyung WJ, Noh SH. A simple method for tension-free Billroth I anastomosis after gastrectomy for gastric cancer. Transl Gastroenterol Hepatol 2017;2:51.

Acknowledgements

The authors are grateful to Dong-Su Jang (Medical Illustrator, Medical Research Support Section, Yonsei University College of Medicine, Seoul, Korea) for his help with the illustrations.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. Kim BJ, O'Connell T. Gastroduodenostomy after gastric resection for cancer. Am Surg 1999;65:905-7.
2. Lee JH, Hyung WJ, Kim HI, et al. Method of Reconstruction Governs Iron Metabolism After Gastrectomy for Patients with Gastric Cancer. Ann Surg 2013;258:964-9.
3. An JY, Yoon SH, Pak KH, et al. A novel modification of double stapling technique in Billroth I anastomosis. J Surg Oncol 2009;100:518-9.
4. Zong L, Chen P. Billroth I vs. Billroth II vs. Roux-en-Y following distal gastrectomy: a meta-analysis based on 15 studies. Hepatogastroenterology 2011;58:1413-24.
5. Lee MS, Ahn SH, Lee JH, et al. What is the best reconstruction method after distal gastrectomy for gastric cancer? Surg Endosc 2012;26:1539-47.

