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Percutaneous Needle Decompression during Laparoscopic Gastric Surgery: A Simple Alternative to Nasogastric Decompression

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Laparoscopic gastric surgeries are routinely performed with use of a nasogastric tube to decompress the upper gastrointestinal tract. A distended upper gastrointestinal tract can complicate successful laparoscopic gastric surgery as the distention compromises not only the visual field but also the laparoscopic manipulation of the stomach. Since nasogastric intubation is not without risks, we have attempted laparoscopic-assisted gastric cancer surgeries without nasogastric tubes. In this article we describe a simple method of aspirating gastric contents using a 9 cm long 19-gauge needle inserted percutaneously during laparoscopic-assisted gastrectomy. First, a 9 cm long 19-gauge disposable needle was introduced through the abdominal wall. This needle was then introduced to the stomach through the anterior wall and the stomach gases and fluids were aspirated by connecting the needle to suction. Thus, a collapsed upper gastrointestinal tract was easily obtained. We performed this procedure instead of nasogastric decompression on twenty-two patients with gastric cancer who underwent laparoscopic-assisted distal subtotal gastrectomy with lymph node dissection. The results were good with only one patient experiencing wound infection (4.5%) and one patient with postoperative acalculus cholecystitis (4.5%). There were no patients with either intraabdominal infection or anastomotic leakage and none of the patients needed postoperative nasogastric decompression, except the patient who experienced acaculus cholecystitis. Percutaneous needle aspiration is a very simple and efficient technique with little risk of postoperative complications. It can be used as an alternative to nasogastric tube decompression of the gastrointestinal tract for laparoscopic-assisted gastrectomy.

Key Words: Laparoscopy, nasogastric intubations, gastric surgery, percutaneous aspiration

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INTRODUCTION

Although gastric surgery without nasogastric intubation has been advocated recently, most surgeons continue to use nasogastric decompression for gastrointestinal surgeries.[1-3] Even in the majority of clinical trials comparing selective versus routine nasogastric decompression, nasogastric tube was used for decompression during the operative procedure. Without nasogastric decompression, it is difficult to get an uncluttered surgical field due to air and fluid in the stomach and duodenum during the operation.[4] Similarly, the laparoscopic gastric surgeries have been performed with routine use of nasogastric tube. It is important to collapse the upper gastrointestinal tract during laparoscopic gastric surgery since upper gastrointestinal distention compromises not only the visual field, but also the laparoscopic manipulation of the stomach.

We have previously reported that intraoperative needle decompression technique can be used without complications as an alternative to nasogastric intubation for intraoperative decompression of gastrointestinal tract for open gastric cancer surgery.[5] However, during laparoscopic surgery, needle decompression is more complicated than during open surgery.

We have attempted laparoscopic-assisted gastric cancer surgeries without nasogastric intubations. In this article we describe a simple method, the aspiration of gastric contents using a 9 cm long 19-gauge needle percutaneously, as a simple alternative to nasogastric intubation for gastrointes-

tinal decompression during laparoscopic-assisted distal gastrectomy.

MATERIALS AND METHODS

Technique

Under general anesthesia, the patient was placed in the reverse Trendelenberg position. After pneumoperitoneum was established using the open technique, 5 ports (two 12 mm and three 10 mm in diameter) were placed. Once the abdominal cavity was explored via laparoscope, the stomach, duodenum and proximal jejunum were usually distended with swallowed or introduced gases during induction of anesthesia. The gases in the duodenum and proximal jejunum were forced into the stomach by external serial squeezing aborally using laparoscopic bowel clamps. The location for the percutaneous introduction of the needle was identified by manually pressing on the abdominal wall. A 9 cm long 19-gauge disposable needle was then introduced through the abdominal wall (Fig. 1). The anterior gastric wall was pulled up using a laparoscopic Babcock clamp and the percutaneously punctured needle was introduced to the stomach through the anterior wall. The gases and fluids collected in the stomach were aspirated by connecting the needle to suction (Fig. 1). During the aspiration, compression of the dependent portion of the stomach such as the fundus and upper body of the stomach facilitates effective aspiration of gastric air and fluid. After aspiration, the upper gastrointestinal tract collapsed, and we were able to perform the surgery for early gastric cancer under optimal conditions. Laparoscopic surgery for early gastric cancer was performed using the following standardized operative procedures: 1) A total or distal subtotal gastrectomy was performed depending on the location of the tumor; 2) D1 + beta or D2 lymphadenectomy was performed according to the rules of "The Japanese Research Society for Gastric Cancer".[6] The greater omentum was first divided and dissected using ultrasonic shears (Laparoscopic Coagulating Shears: LCS; Ethicon, Cincinnati, OH, USA) toward the lower pole of the spleen. Division was then continued all the way to the short gastric vessels to dissect the left gastroepiploic vessels at their roots. The division of the gastrocolic ligament was continued distally toward the pylorus, then the right gastroepiploic vessels were divided at their roots. The soft tissues attached to the duodenum were dissected. The lesser omentum was then opened and the duodenum was transected 1 cm distal to the pylorus using an endoscopic stapling device. The right gastric artery was exposed and divided at its origin. The lymph nodes bearing soft tissues around the common hepatic artery were dissected, revealing the left gastric vein, which was divided at the upper margin of the common hepatic artery or pancreas. This was achieved by lifting the stomach superiorly. The left gastric artery was also exposed and severed at the root during the dissection of the lymph nodes. Perigastric lymph nodes were dissected along the lesser curvature up to the esophagocardial junction. By connecting two epigastric trocar incisions, a 5 cm mini-laparotomy incision was located in the epigastrium. The stomach was taken out for resection and anastomosis. After gastrectomy, the gastrointestinal continuity was restored by either a gastroduodenostomy or gastrojejunostomy depending on the location of tumors in a distal subtotal gastrectomy and by Roux-en-Y esophagojejunostostomy in a total gastrectomy. Gastroduodenostomy was constructed using a circular stapler (Ethicon, Cincinnati, OH,

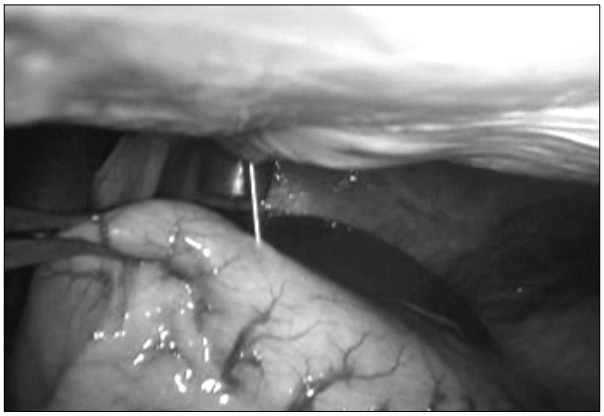

Fig. 1. Percutaneous needle decompression of distended stomach during laparoscopic gastric surgery. A 9 cm long 19-gauge disposable needle is introduced through the abdominal wall.

USA). The gastrojejunostomy was performed using interrupted 3-0 silk Lembert sutures for the outer layer and a running 3-0 polyglycolic suture for the transmural inner layer. Esophagojejunostomy was done using a circular stapler. Minilaparotomy was closed with continuous 1-0 polydioxanone sutures and the trocar sites were closed with 2-0 polydioxanone sutures. The subcutis and cutis were restored with interrupted 3-0 silk sutures and skin staples.

RESULTS

Twenty-two patients with gastric cancer underwent laparoscopic-assisted distal subtotal gastrectomy with lymph node dissection without nasogastric decompression. Instead, a 9 cm long 19-gauge disposable needle was introduced percutaneously during the operative period to decompress the gastrointestinal tract. The patients' characteristics were comparable to usual gastric cancer patients. Patients were 15 males and 7 females with a mean age of 57 years (range 35-78 years). Among them, 11 patients had no other co-morbid diseases whereas the other 11 patients had one or more co-morbid disease such as hypertension, diabetes mellitus, or pulmonary diseases.

The results were good with only one patient experiencing wound infection (4.5%) and one patient with postoperative acalculus cholecystitis (4.5%). There were no patients with either intraabdominal infection or anastomotic leakage. None of the 21 patients experienced vomiting in the postoperative period, however, the one patient (4.5%) who experienced acalculus cholecystitis complained of nausea and showed clinical and radiological abdominal distension.

The restoration of bowel sounds was noted at 2.6 ± 0.7 postoperative days, first flatus was passed at 3.1 ± 0.6 postoperative days, soft diet was started at 4.6 ± 1.4 postoperative days and the duration of hospital stay was 7.5 ± 3.2 days. None of the patients needed postoperative nasogastric decompression, except the patient who experienced acaculus cholecystitis.

DISCUSSION

Percutaneous needle decompression technique during laparoscopic gastric surgery can be used without complications as an alternative to nasogastric tube for intraoperative decompression of the gastrointestinal tract for an uncluttered surgical field. This technique can prevent possible injuries caused by the insertion of a nasogastric tube. We find it is an easy and simple technique to perform.

Many surgeons have reported benefits from not using the nasogastric tube during and after major abdominal surgeries, including gastric surgery.[1-5,7,8] In spite of these reports, many surgeons still use nasogastric tubes during and after gastric cancer surgery for better surgical exposure and because of the belief that the gastrointestinal decompression might prevent serious complications such as anastomotic leak, aspiration, and wound dehiscence, without any scientific evidences.[7] The benefit of nasogastric decompression has been questioned in many clinical trials, that compared selective versus routine nasogastric decompression after abdominal surgery.[1-3,9] It is well recognized that nasogastric tubes cause significant patient discomfort such as sore throat, ear pain, nasal soreness, and painful swallowing. Nasogastric decompression is associated with an increased incidence of complications e.g. fever, atelectasis, pneumonia and potential injuries to the nose, pharynx, esophagus, and stomach.[7-10] Nasal, pharyngeal, esophageal, and gastric injuries can be caused by the intubation procedure itself not by the postoperative tube indwelling status.[9,10]

The intraoperative needle decompression technique has been proposed to make it possible to perform gastrectomy with extended lymph node dissection without pre-, intra- and postoperative nasogastric decompression.[5] Percutaneous needle decompression for laparoscopic gastric surgery is a modified technique of this intraoperative needle decompression technique. This procedure is very simple and efficient and has little risk of postoperative complications. This technique can be used as an alternative to nasogastric tube decompression of the gastrointestinal tract during laparoscopic gastric surgery.

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