



The management of gastric outlet obstruction secondary to inoperable cancer

An evaluation of laparoscopic gastrojejunostomy

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Abstract

Background: Historically, the distressing symptoms of malignant gastric outlet obstruction have been best managed by open gastrojejunostomy. We provide an assessment of an alternative laparoscopic technique.

Methods: We reviewed eight patients undergoing laparoscopic gastrojejunostomy. Patient data included age, sex, operation time, morbidity and mortality, length of stay, and outcome at 6 months where possible.

Results: There were six men and two women, their median age was 67 years. Median operating time was 135 min, median time to solid food was 4 days, and median postoperative stay was 7 days. Seven of our eight patients were palliated successfully using this technique.

Conclusion: The risks inherent in operating on these patients, who are by definition in a poor state of health, has encouraged much interest in minimal access surgery. We conclude that laparoscopic gastrojejunostomy provides effective palliation of gastric outlet obstruction, and we recommend further evaluation of this technique.

Key words: Laparoscopic gastrojejunostomy — Gastric outlet obstruction — Palliation — Cancer

Gastric outlet obstruction may be encountered in the advanced stages of several disease processes, one of the most well recognized being carcinoma of the pancreas [8]. Typically, by the time symptoms become manifest, curative resection of the underlying tumor is no longer possible and only palliative therapeutic options remain [8]. Although associated symptoms of pain and jaundice may complicate the clinical picture, effective nonsurgical treatment options are available for these symptoms [3, 6, 8, 12]. However, while duodenal stenting undergoes further evaluation [6, 8], gastric outlet obstruction is still

managed most effectively by operative intervention. Historically, the operation of choice was an open gastrojejunostomy, perhaps even performed prophylactically during an abandoned attempt at curative resection [17]. As minimal access techniques have become more widespread, however, laparoscopic gastroenteric bypass may now be regarded as a preferable option [1, 4, 6, 18, 19]. The aim of this study was to assess the value of this procedure.

Materials and methods

We reviewed eight patients who underwent laparoscopic gastrojejunostomy between February 1998 and July 2000. For each patient, we recorded age, sex, American Society of Anesthesiologists (ASA) grade, operation time, time to solid food, morbidity and mortality, length of stay, and outcome at 6 months where possible. We also documented whether or not biliary decompression was required at any stage during the illness. In determining inoperable cancer as the cause for gastric outlet obstruction, we used a combination of a highly typical clinical presentation with either computerized tomography (CT), cholangiopancreatography, or both.

The operation was performed in each case under general anesthesia with a nasogastric tube in situ. Intravenous antibiotics were given on induction. In the earlier part of the series, the patients were placed supine with a minor degree of right-sided tilt to allow better access. With the operator standing between the patients legs, a 10-mm infraumbilical port was placed (Fig. 1, site A) and a pneumoperitoneum induced with gentle insufflation of carbon dioxide gas to a pressure of 12 mmHg. A 10-mm laparoscope was inserted, and a general laparoscopy was performed. A 10-mm and a 12-mm port were then placed at sites B and C, respectively.

With the camera at A and graspers at B and C, an appropriate segment of jejunum was mobilized toward the antrum of the stomach, with the afferent loop toward the lesser curve; this was held in place using Babcock forceps. Using scissors, an incision was made in the stomach and jejunum that was large enough to allow passage of the arms of the laparoscopic stapling gun. The stapling gun was then introduced through site B, and the anastomosis was performed using two or three cartridges of the stapling device. The enterostomy was closed with intracorporeal 2/0 Vicryl sutures (a fourth, optional 5-mm port site in a low midline position was occasionally used to facilitate closure depending on the angle of access to the suture line). Hemostasis was

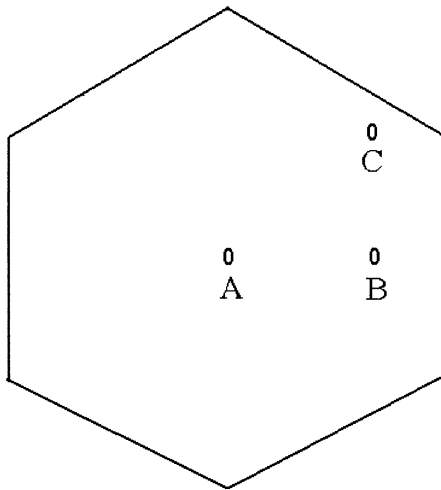


Fig. 1. Schematic of abdomen showing original port sites.

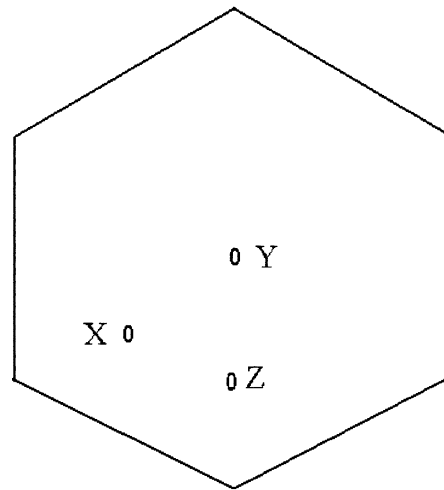


Fig. 2. Schematic of abdomen showing revised port sites.

Table 1. Patient profile

Patient no.	Age (sex)	Cause of gastric outlet obstruction	Perioperative morbidity	Outcome after surgery	Stoma working at death (or last follow-up*)
1	70 (f)	Carcinoma of gallbladder	None	Died at 40 d	Yes
2	65 (m)	Carcinoma of duodenum	None	Well at 6 m	Yes
3	69 (m)	Carcinoma of pancreas	Pneumonia	Died at 25 d	No
4	68 (m)	Carcinoma of pancreas	None	Well at 6 m	Yes
5	66 (m)	Carcinoma of pancreas	None	Well at 6 m	Yes
6	64 (m)	Carcinoma of pancreas	None	Died at 4 m	Yes
7	63 (m)	Carcinoma of duodenum	None	Well at 6 m	Yes*
8	75 (f)	Carcinoma of pancreas	None	Well at 6 m	Yes*

confirmed and the port sites closed. The nasogastric tube was left in place for 48 h. Oral intake was gradually commenced thereafter. We did not routinely perform upper gastrointestinal imaging to confirm patency.

However, after one case of efferent loop obstruction, which was considered to be a technical failure, the surgical approach was changed. This failure occurred in a frail, elderly gentleman who was then considered to be unfit for further remedial surgery. The patient died shortly afterward from bronchopneumonia.

In the alternative approach, the surgeon and camera operator stood on the patient's right side. A 5-mm camera was placed through a 12-mm port in the right iliac fossa (Fig. 2, site X), and another 5-mm port was placed at the umbilicus (site Y). A 5-mm port was placed in a low midline position (site Z) to allow proper triangulation. The proximal jejunum and stomach were aligned as previously described with the afferent loop to the lesser curve. A holding suture was placed on the greater curve aspect of the stomach and jejunum using a 2/0 silk suture on a straight needle. After the suture was tied, the needle was brought out through the anterior abdominal wall and held with Dunhill artery forceps to attain stability of the anatomy prior to performing the anastomosis. The stomach and jejunum were then opened as described previously. The camera was then transferred to port Y and the laparoscopic stapling gun inserted through port X. The anastomosis and closure was performed as above.

Results

There were six men and two women with a median age of 67 years (range, 63–75) and an ASA grade ranging from II to IV (three were II, four were III, and one was IV). The median operating time (inclusive of anesthetic

time) was 135 min (range, 75–255). There were no perioperative complications. Median time to solid food was 4 days (range, 2–7), and median postoperative stay was 7 days (range, 5–13).

One patient developed postoperative pneumonia and failed to recover, active treatment having been withdrawn. In this patient, the stoma did not achieve patency prior to death. This must be considered a technical failure, probably due to efferent loop obstruction caused by kinking of the bowel or too tight an anastomosis at the greater curve aspect. It was at this time that a decision was made to alter the access position of the ports to facilitate a right-sided approach. Of the remaining seven patients, five had good palliation of symptoms until their deaths, and two patients are still able to tolerate a normal diet 6 months after their surgery (Table 1).

Inoperable cancer was confirmed to be the cause of gastric outlet obstruction in seven of eight cases. In one case, the cause was thought to be pancreatic cancer after cholangiopancreatography; however, autopsy (which was carried out 9 months after surgery, when the patient died of unrelated causes) demonstrated a mass at the head of the pancreas more consistent with chronic pancreatitis than with carcinoma. Six patients developed obstructive jaundice during the course of their illness. Five of these six cases responded to endoscopic biliary decompression; one patient required percutaneous transhepatic drainage.

Discussion

Laparoscopic gastroenteric bypass surgery for the management of gastric outlet obstruction has generated a good deal of interest among investigators [1, 4, 6, 19]. The most well-recognized cause of malignant gastric outlet obstruction is carcinoma of the pancreas [8] and, given its aggressive nature, work by previous authors has quite rightly centered on this disease. However, once gastric outlet obstruction has become manifest and the tumor has been deemed to be inoperable, the precise nature of the underlying disease becomes less significant. Certainly, our experience so far shows that laparoscopic gastrojejunostomy can successfully treat other causes of malignant obstruction in addition to pancreatic carcinoma. Furthermore, while it has been demonstrated that duodenal stenting can offer adequate palliation in the short term, concerns regarding the cost of the procedure, stent migration, and the medium-to long-term patency rate of the endoprosthesis have not yet been fully addressed [2, 5, 10].

How one determines that the tumor is inoperable is an interesting question. Historically, patients were often subjected to laparotomy to determine resectability. Technical advances such as high resolution CT, spiral CT angiography, and laparoscopy with ultrasound have led to a greater emphasis on preoperative tumour staging [7, 14, 16]. The debate still continues as to whether these modalities are more accurate than open exploration; for some patients, there is clearly a fine line between unnecessary surgery and denying a chance for cure. We think that there is a place for minimally invasive, palliative therapeutic options, but these methods should be implemented only after thorough preoperative investigations have confirmed the diagnosis and established beyond doubt that the tumor is inoperable. The fact that, using CT, cholangiopancreatography, or both (a choice determined largely by the availability of these resources), one of our patients was shown not to have cancer on postmortem examination would seem to reinforce this assertion. Furthermore, after thorough preop staging and workup, we believe that there will always be a group of patients who refuse, are unsuitable, or are unfit for radical surgery. A proven and reliable minimally invasive palliative bypass operation would be a useful management option in these patients.

Gastric outlet obstruction is typically seen in advanced disease, and some physicians even regard it as a preterminal event [13]. At this stage, severe pain and obstructive jaundice may already be present [9]. Different approaches to pain management have been explored by various authors, including chemical splanchnicectomy under CT guidance and thoracoscopic splanchnicectomy [6, 9]. In our series, however, we found that oral administration of long-acting morphine derivatives provided adequate pain control.

The treatment of obstructive jaundice has generated more debate. Studies have shown that endoscopic biliary decompression is as effective as open surgical bypass, but it is associated with more long-term complications, such as stent migration or infection [3, 11]. Six of our

patients required palliation of obstructive jaundice, and in all six this was successfully achieved with placement of a stent, either endoscopically or percutaneously.

We have been most impressed with the rapid postoperative recovery of all but one of our patients following laparoscopic surgery. The median length of stay does not reflect this outcome and is more in keeping with the senior author's (M.C.P.) conservatism following the introduction of this technique to our unit. Actually, patients are now beginning to leave hospital after 2 or 3 days as our confidence in the procedure has increased. Similarly, there is a definite learning curve reflected by the operating time. In our experience, once the technique has been learned, the average operating time (inclusive of anesthetic time) comes down to between 60 and 90 minutes. While there is no doubt that an open procedure might be faster, we believe that the longer postoperative recovery time would offset this advantage. The use of a small upper midline incision for the open procedure would appear to be a reasonable compromise solution; however, whether this technique can be applied consistently remains to be seen. Furthermore, as laparoscopy with ultrasound is increasingly used as a staging tool, formation of a gastroenteric bypass during the staging laparoscopy may be the best solution for some patients [7, 15].

In conclusion, although our data must be considered preliminary, it is clear that laparoscopic gastrojejunostomy does effectively palliate the distressing symptoms of gastric outlet obstruction and that further evaluation of this and alternative techniques is required.

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