ACUTE PANCREATITIS AS AN EARLY COMPLICATION AFTER GASTRIC RESECTION

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The aim of the study was to demonstrate acute pancreatitis (AP) as an early complication after gastric resection procedures.

Material and methods. Medical records were analyzed for acute pancreatitis as an early postoperative complication in patients treated in Department of Surgery of 4th Military Clinical Hospital in Wrocław between January 2000 and December 2009 who underwent gastric resection procedures. Indications for the surgical treatment included both gastric malignancy as well as complications of gastric and duodenal ulcer disease: pyloric stenosis, bleeding ulcer.

Results. Between 2000 and 2009, 123 patients underwent gastric resection procedures (104 due to malignancy, 19 due to complications of gastric and duodenal ulcer disease). The overall complication rate was 32.5%: 26 patients developed general complications (cardiorespiratory failure, cardiac arrhythmias, pleural effusion, psychosis), 10 patients developed abdominal complications (fistula of the anastomosis, pancreatic fistula), infection of the postoperative wound occurred in 6 patients. Perioperative death occurred in 8 patients (mortality rate: 6.5%), including 3 patients who underwent surgical treatment in an urgent setting due to bleeding with accompanying hemorrhagic shock. Acute pancreatitis occurred in four patients (3.25%): all cases were severe and required resection of necrotic pancreatic lesions. The disorder resolved in three cases and patients were discharged home; one patient who developed additional complications, died (mortality rate: 25%).

Conclusions. The reported cases of acute pancreatitis after gastric resections procedures were severe, involved pancreatic nacrosis and abscesses and required surgical intervention. Postoperative AP carries high risk of death and its successful treatment depends on properly timed surgical intervention resulting in removal of necrotic pancreatic lesions along with intensive medical treatment using e.g. parenteral nutrition and aggressive antibiotic therapy.

Key words: postoperative acute pancreatitis, gastrectomy, complications of gastrectomy

For over 100 years, total or partial gastric resection has been a commonly used surgical procedures in the treatment of gastric disease although over the last decades, indications for gastric resection has changed dramatically. Progress in pharmacotherapy and endoscopic treatment caused resections due to gastric or duodenal ulcer disease and its complications to be used rarely; currently malignancy is the principal indication for gastric resection. Irrespective of indications and despite progress in surgical techniques and perioperative care, gastric resection procedures are still associated with quite high mortality rate and risk of multiple complications. These complications can be categorized as general complications, such as respiratory failure, cardiac or thromboembolic complications and surgical complications, such as anastomosis leak, pancreatic fistula, duodenal remnant leak or local complications related to postoperative wound healing. Available literature data on complications of gastric surgery (predominantly studies of gastric cancer treatment) indicate that the complication rate ranges from 10.7 to 40% and mortality rate from 0.6 to 14.4% (1-15).
These discrepancies in complication and mortality rate result from inhomogeneity of patient groups reported in these publications. For example, Yasuda et al., unlike most of Japanese authors (dealing with treatment of an early cancer) included only patients with tumors >10 cm (13).

Acute postoperative pancreatitis (APP) is one of the most serious through recently reported only rarely, complications of gastric resection procedures (16, 17, 18). Incidence of acute postoperative pancreatitis after gastric surgery is currently difficult to estimate. Most studies of complications of gastric resection procedures do not specify acute pancreatitis. Available data indicate that it does not exceed 5% (16) although there are reports suggesting that incidence of acute postoperative pancreatitis following gastric resection due to peptic ulcer of the stomach or duodenum is as high as 40.8% (17). APP has also been reported after laparoscopic-assisted gastric resection procedures – according to Park et al.: 2 cases per 300 patients, while according to Bo et al. two cases per 302 patients, indicating incidence 0.66% (19, 20). Polish literature indicates that incidence of APP is 0.73%, 0.42%, 0.2%, and according to some authors as high as 21% (21-24). According to Panecka, basing on 14960 autopsies, complete picture of acute hemorrhagic necrosis of the pancreas was found in 5.3% deaths after gastric and duodenal operations (23). These data were obtained when ulcer disease was the principal indication for gastric resection procedures. Such discrepancies in APP incidence may result from lack of definite diagnostic symptoms of APP as well as presence of overlapping symptoms found in other postoperative complications.

Acute pancreatitis after gastric resection procedures carried much higher risk of complications than AP of different etiology (25), i.e. much often severe, associated with pancreatic necrosis and therefore carries much higher risk of death. Mortality rates as high as approximately 50 – 60% have been reported (16, 17, 21) but from studies basing on few cases (e.g., study by Śnieżyński included 9 patients and 6 of them died – these were patients after partial gastric resection due to complications of gastric ulcer disease) (21). Therefore mortality in acute pancreatitis after gastric resection procedures is much higher than mortality rate in AP of different etiology (mainly biliary and alcohol-induced) where severe cases are found in approximately 10 – 20% of patients with mortality in this group ranging from 10% to 25% (25). Most of the authors believe that this complication is caused by mechanical injury of the pancreatic parenchyma during the procedure, with or without damage of the pancreatic ducts; impairment of pancreatic perfusion related to dissection of this area; regurgitation of bile and duodenal contents to pancreatic ducts (afferent loop syndrome after Billroth II resection and omega gastrojejunostomy); functional abnormalities associated with damage of nerves and duodenopancreatic reflex (21), contraction or edema of Vater’s papilla (17). Increased risk of APP may be associated with total resection (versus partial resection) and extensive lymphadenectomy and resection of adjacent organs (mainly spleen and pancreas).

MATERIAL AND METHODS

Medical records were analyzed for acute pancreatitis as an early postoperative complication in patients treated in Department of Surgery of 4th Military Clinical Hospital in Wrocław between January 2000 and December 2009 who underwent gastric resection procedures. The analysis included 123 patients (39 women, 84 men), at an average age of 65.4 years (from 37 to 91 years). Indications for surgical treatment included both gastric malignancy (104 patients) as well as complications of gastric and duodenal ulcer disease: pyloric stenosis, bleeding ulcer (19 patients), including 9 patients who underwent emergency surgical treatment for gastrointestinal bleeding.

Depending on indications, location and extent of changes, total or partial (most commonly subtotal) gastric resection was performed with Omega esophago- (or gastro-) jejunostomy with Braun fistula (89 patients, including 23 patients with splenectomy) or Roux-Y anastomosis (22 patients, including 9 with splenectomy); Rydygier partial gastric resection was performed in few cases (12 patients). Parenteral nutrition and antibiotic therapy was given in all patients after the procedures’ on day 5 or day 6 oral nutrition was started.

CASE REPORTS AND RESULTS

The overall complication rate was 32.5%; 26 patients developed general complications
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1. A patient at the age of 52, without any significant medical history, with preoperative pathological diagnosis adenocarcinoma exulcerans ventriculi. Intraoperative examination demonstrated a 8 x 6 cm tumor, located below the pylorus, infiltrating the tail of the pancreas; total gastric resection was performed with Omega esophagojejunal anastomosis and Braun fistula plus resection of the spleen and Braun fistula plus splenectomy. During preparation of infiltrated pancreatic capsule, a bleeding from the pancreatic parenchyma occurred and was controlled with ligations and TachoComb dressing. Margins of cutting were shown to be free of malignant cells in histopathological examination. Immediately after the procedure the patient was transferred to Clinical Department of Anesthesiology and Intensive Therapy (CDAIT) due to respiratory insufficiency. After 2 days the patient was in good general condition and was transferred back to Clinic of Surgery. On day 5 increased discharge of an opaque fluid from the drain placed in the operated region was found; due to low levels of serum amylase, it was mistakenly taken for a sign of a fistula of esophagojejunal anastomosis. Therefore, in view of a good general condition of the patients, a decision was taken to proceed with medical treatment and use complete parenteral nutrition and antibiotic therapy. After 3 days of parenteral nutrition, due to trace amounts of discharge from the drain placed in the operated region, no signs of a fistula were found and oral nutrition was started. During further hospitalization the patient developed fever, antibiotic therapy was restarted, but without any significant improvement. In view of persisting hectic fever and worsening of patient’s general condition with pain of the abdomen, a decision was taken to perform computed tomography imaging of the abdominal cavity that demonstrated signs of acute pancreatitis (fluid collections of abscess nature, surrounding the head, body and tail of the pancreas, the pancreas had blurred structure), while serum biochemistry was unremarkable – serum amylase was 87 IU/l. Laparotomy was performed and abscess collections were found in the region of the pancreas and sequesters of charged home in good general and local condition.

2. A patient at the age of 67, except for pharmacologically controlled hypertension, without any other significant medical history. He underwent surgical treatment due to tumor of the cardia found during gastroscopy (histopathological diagnosis: adenocarcinoma). Intraoperatively an extensive malignant infiltration of almost whole stomach (linitis plastica) was found with infiltration of the pancreatic capsule. Total gastrectomy was performed with Omega esophagojejunal anastomosis and Braun fistula plus splenectomy. During preparation of infiltrated pancreatic capsule, a bleeding from the pancreatic parenchyma occurred and was controlled with ligations and TachoComb dressing. Margins of cutting were shown to be free of malignant cells in histopathological examination. Immediately after the procedure the patient was transferred to Clinical Department of Anesthesiology and Intensive Therapy (CDAIT) due to respiratory insufficiency. After 2 days the patient was in good general condition and was transferred back to Clinic of Surgery. On day 5 increased discharge of an opaque fluid from the drain placed in the operated region was found; due to low levels of serum amylase, it was mistakenly taken for a sign of a fistula of esophagojejunal anastomosis. Therefore, in view of a good general condition of the patients, a decision was taken to proceed with medical treatment and use complete parenteral nutrition and antibiotic therapy. After 3 days of parenteral nutrition, due to trace amounts of discharge from the drain placed in the operated region, no signs of a fistula were found and oral nutrition was started. During further hospitalization the patient developed fever, antibiotic therapy was restarted, but without any significant improvement. In view of persisting hectic fever and worsening of patient’s general condition with pain of the abdomen, a decision was taken to perform computed tomography imaging of the abdominal cavity that demonstrated signs of acute pancreatitis (fluid collections of abscess nature, surrounding the head, body and tail of the pancreas, the pancreas had blurred structure), while serum biochemistry was unremarkable – serum amylase was 87 IU/l. Laparotomy was performed and abscess collections were found in the region of the pancreas and sequesters of charged home in good general and local condition.

10 patients developed abdominal complications (fistula of the anastomosis, pancreatic fistula), infection of the postoperative wound occurred in 6 patients. Perioperative death occurred in 8 patients (mortality rate: 6.5%), including 3 patients who underwent surgical treatment in an urgent setting due to bleeding with accompanying hemorrhagic shock. Acute pancreatitis occurred in four patients (3.25%). Three patients resolved, while one patient died as a result of additional general complications (mortality in the group of patients who underwent surgical treatment of AP was 25%).
the tail and body of the pancreas were found. No evidence of fistula of the anastomosis was found. Pathological collections were resected with detached pancreatic sequesters, flushing drainage was used. No further complications were observed during the rest of the hospitalization. On day 56 the patient was discharged home in good general and local condition.

3. A patient at the age of 48, without any other significant medical history, underwent surgical treatment for an extensive tumor of the gastric body (preoperative histopathological diagnosis: adenocarcinoma ventriculi) – total gastrectomy with Omega esophagojejunal anastomosis and Braun fistula plus splenectomy. On day 3 signs of leaking anastomosis were found, laparotomy was performed and extensive necrotic lesions in the head, body and tail of the pancreas as well as in the adjacent tissues were found, including in the region of esophagojejunal anastomosis and its leak. Necrotic pancreatic lesions were presumed to be the cause of the anastomosis leak; necrotic tissues were removed (histopathological examination: acute hemorrhagic pancreatitis), leakage was protected with sutures. Gastroscopy was performed after the surgical procedure, demonstrating significant stenosis at the site of esophagojejunal anastomosis with a defect on its posterior wall; the anastomosis region was secured with a self-expanding esophageal prosthesis. The patient developed further complications, e.g. atrial tachycardia that required electrical cardioversion, thoracocentesis was performed twice due to pleural effusion. Patient’s condition progressively deteriorated and on day 45 after diagnosing AP, he was certified dead.

4. A patient at the age of 51, without any significant medical history, underwent partial gastrectomy with Omega gastrojejunal anastomosis and Braun fistula due to ulcer-induced pyloric stenosis. On day 2 after the procedure serum amylase increased to 670 IU/l and then started to decrease (194 IU/l on day 5). On day 7 a decision was taken to proceed to laparotomy due to worsening of patient’s general condition with signs of gastrointestinal obstruction. During laparotomy a final small intestine loop was found stuck in the area of hepatic flexure, causing obstruction, and partial dehiscence of gastrojejunal anastomosis. Adhesions causing the obstruction were freed and the site of anastomosis dehiscence was secured with sutures and covered by major omentum. Furthermore, slight edema of the pancreas was found, without evidence of necrosis or fluid at this site. After 10 days the patient was reoperated due to abdominal distention with peritoneal signs and persistent fever above 38°C despite antibiotic therapy. Extensive necrotic lesions were found in the head of the pancreas and gangrenous gall-bladder; gastrojejunal anastomosis and duodenal remnant were verified but no evidence of leak was found. Sequesters of the pancreas were removed, cholecystectomy was performed and flushing drainage was maintained. After initial improvement, after 17 days patient’s general condition worsened again. Computed tomography imaging demonstrated extensive abscess of retroperitoneal space, repeated laparotomy was performed and approximately 1000 ml of purulent fluid with sequesters of the pancreas were evacuated from the right retroperitoneal space; flushing drainage was continued. After another 16 days, due to evidence of intestinal fistula, the patient was reoperated and extensive perforation of the posterior wall of cecum and ascending colon was found. After extensive flushing of the retroperitoneal space, the perforation site was secured with sutures, distal intestinal fragment was cut from the cecum and a stoma was formed (due to massive adhesions, large intestine could not be freed). The patient developed another complication: bleeding from the retroperitoneal space with perforation of the sigmoid colon (the patient underwent three more operations, the last laparotomy with formation of loop stoma on a small intestine and end-loop stoma on the sigmoid colon took place on day 56 after the primary surgical procedure). Further treatment (during this time the patient was almost exclusively hospitalized in Clinical Department of Anesthesiology and Intensive Therapy), gradual improvement of general condition was achieved and the patient was discharged home in good general condition on day 101 after the gastric resection.

DISCUSSION

Gastric resection procedures, despite ongoing progress in surgical techniques and perioperative care, still carry a relatively high risk of serious complications. Results presented in this study related to complication and mortal-
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Acute postoperative pancreatic was found in four cases (3.25%), which supported literature data that it was a relatively rare complication (16, 18, 21-24). For example, Part et al. report two cases per 300 patients (19), Bo et al. also reported two cases per 302 patients (20). In all reported cases, AP after gastric resection procedures was severe and was related to pancreatic necrosis and abscesses, requiring repeated surgical intervention (in one patient – multiple interventions), which also supported literature data (16, 25). Postoperative AP carries a high risk of death. Aggressive treatment adjusted to the current clinical condition of the patient, including well timed surgical intervention involving resection of pancreatic necrotic lesions along with intensive supportive treatment involving any possible modalities of intensive therapy, e.g. nutritional therapy (due to clinical condition of our patients and possibility of coexistence of other complications, predominantly gastrointestinal leak, parenteral nutrition was used), is a precondition of success.

Making the diagnosis of acute postoperative pancreatitis is challenging in complicate cases due to possible coexistence of other complications blurring the clinical picture which was emphasized by authors reporting AP related to gastric procedures (16, 21-24). This is particularly the case when anastomosis fistula coexists where it is often difficult to determine which was the first to occur – anastomosis or AP. Furthermore, serum amylase did not significantly differ from normal values (only in one case postoperative increase of serum amylase was significant), which was also emphasized by other authors, for example Kuo et al., Śnieżyński et al. (16, 21). Clinical presentation supported by results of imaging studies (US, CT) was the decisive factor, supporting AP, in determining indications for reoperation. Early occurrence of infected pancreatic necrosis seems to be a feature that differentiates acute postoperative AP from AP of different etiology, which was already pointed out by e.g. Śnieżyński et al. (21). Necrotic lesions with an abscess in the pancreatic region were observed as early as on day 3 after the primary operation, which supported early surgical intervention, while according to current guidelines, week 3-4 after appearance of symptoms is considered an optimal time for surgical intervention (25, 26).

Gastric malignancy with high grade local advancement was an indication for surgical treatment in three out of four reported cases. Total gastrectomy with Omega esophagojejunostomy and Braun fistula plus spleen resection (in one case expended with resection of the tail of pancreas) was performed. Partial gastric resection (with Omega gastrojejunal anastomosis and Braun fistula) was performed in a fourth patient due to ulcer induced pyloric stenosis. In two reported cases, AP seemed to be related to perioperative injury of the pancreas, which seems to be the most common cause also according to other authors (16, 21-24).

In two other patients such relationship could not be established. Neither age (mean age 54.5 vs 65.4 years in all analyzed patients) nor general status before the surgical treatment (patients in 2nd risk group according to ASA) affected the risk; neither of conventional etiological factors of AP was found before the procedure, such as cholelithiasis, excessive alcohol consumption or metabolic abnormalities.

In one out of four reported patients, an attempt of surgical treatment of acute pancreatitis as a complication of gastric resection was unsuccessful, leading to death; therefore mortality rate was 25%. Due to the fact that most of the currently available literature also reports only sporadic cases of postoperative AP and mortality rate reported by different authors vary widely (from 12.6% to 66%) (16, 17, 19, 21), it is difficult to objectively compare treatment results.

In summary, acute pancreatitis as a complication of gastric surgery, although rare, is a fatal occurrence for the patient’s prognosis. Aggressive treatment, including surgical treatment, adjusted to current patient’s clinical condition, is a precondition of success. It is possible due to careful clinical observation of the postoperative process, including predicting possible complications that could ruin efforts of the whole surgical team undertaking treatment of patients with gastric disorders.
REFERENCES


