Pseudoaneurysm of gastroduodenal artery following radical gastrectomy for gastric carcinoma patients

Dong Yi Kim, Jae Kyoon Joo, Seong Yeob Ryu, Young Jin Kim, Shin Kon Kim, Yong Yeon Jung

Division of Gastroenterologic Surgery, Department of Surgery, Chonnam National University Medical School, Gwangju, Korea

Correspondence to: Dong Yi Kim, M.D. Division of Gastroenterologic Surgery, Department of Surgery, Chonnam National University Medical School, 8 Hakdong, Dongku, Gwangju 501-757, Korea. dockim@chonnam.ac.kr

INTRODUCTION

The causes of pseudoaneurysms include infection, trauma, and surgical procedures[1]. The development of pseudoaneurysms after upper abdominal surgery is rare, and most occur after biliary and pancreatic surgery[2-5]. There have been only a few reported cases of postoperative pseudoaneurysm of an artery following abdominal surgery. We recently encountered a patient with a ruptured pseudoaneurysm of the gastroduodenal artery following radical gastrectomy for gastric carcinoma.

CASE REPORT

A 73-year-old male was admitted with a two-month history of epigastric discomfort and weight loss. An upper gastrointestinal series, endoscopy, and abdominal CT scan suggested gastric carcinoma. The preoperative laboratory work-up was normal.

Laparotomy revealed an advanced gastric carcinoma involving the adjacent lymph nodes. No peritoneal dissemination or hepatic metastasis was found. The patient underwent a successful radical gastrectomy and the regional lymph nodes, and perivascular lymphatics surrounding the gastroduodenal artery were dissected.

Macroscopically, a curative resection was performed. Postoperative microscopic examination revealed poorly differentiated adenocarcinoma involving the serosal layer of the stomach, and metastasis in one of the twenty-eight lymph nodes dissected.

On postoperative day eight, a wound infection with moderate fever developed, and examination of the anastomotic site revealed no leakage. Twenty-five days after the operation, he suddenly developed abdominal distention with hypovolemic shock. A tentative diagnosis of hemoperitoneum was made and an emergency angiography was performed. An emergency celiac trunk arteriogram revealed a pseudoaneurysmal sac originating from the gastroduodenal artery (Figure 1). To obliterate the pseudoaneurysm transcatheter embolization with steel coils was attempted (Figure 2), but failed. We performed an emergent laparotomy. There was a large hematoma around the gastroduodenal artery. The gastroduodenal artery was allegedly ligated. The patient recovered and was discharged from the hospital two weeks later. He had no subsequent bleeding episodes and was doing well two months following discharge.

DISCUSSION

Pseudoaneurysms result from a variety of mechanisms,
including infection, trauma, and surgical procedures\(^\text{[3]}\). All have in common disruption of arterial continuity with extravasation of blood into the surrounding tissues. This ultimately results in the formation of a fibrous tissue capsule that progressively enlarges due to the unrelenting arterial pressure\(^\text{[1]}\). Gastrroduodenal artery aneurysms account for 1.5% of all splanchnic artery aneurysms, but the true incidence of postoperative pseudoaneurysm of the gastroduodenal artery is unknown\(^\text{[6]}\). Postoperative pseudoaneurysm formation is uncommon, but can follow surgical trauma during gastrointestinal surgery or perioperative local infection\(^2\,7\,8\). There is usually a history of massive bleeding and perioperative local infection when the pseudoaneurysm develops\(^\text{[2]}\). Our patient had a local wound infection and massive intra-abdominal bleeding.

Our review of the literature revealed no reported cases of postoperative pseudoaneurysm of the gastroduodenal artery following radical gastrectomy. We assumed that the pseudoaneurysm formation had been caused by a weakness in the arterial wall according to skeletonization resulting from lymphadenectomy.

When an intra-abdominal pseudoaneurysm is suspected, angiography is useful for determining the exact location of the pseudoaneurysm. In addition, it can save time and prevent the danger of an emergency laparotomy to locate the source of bleeding without angiography\(^\text{[9]}\). In our case, emergent angiography was performed after the episode of massive intra-abdominal bleeding and demonstrated a pseudoaneurysm arising from the gastroduodenal artery. Many authors\(^\text{[4,6,9-11]}\) have recommended transcatheter occlusion or selective embolization as a useful method in high-risk patients. Basile \textit{et al.}\(^\text{[12]}\), Bulut \textit{et al.}\(^\text{[13]}\), and Furukawa \textit{et al.}\(^\text{[14]}\), reported successful transcatheter arterial embolization in a patient who developed pseudoaneurysm after abdominal surgery. We tried transcatheter arterial embolization, but failed to control the bleeding.

Although it is impossible to know the true incidence of postoperative pseudoaneurysm of the gastroduodenal artery, it may develop due to iatrogenic injury during surgery\(^\text{4,15}\).

We should consider the possibility of pseudoaneurysm formation in a patient with intra-abdominal bleeding during the postoperative period following radical gastrectomy with regional lymph nodes and perivascular lymphatic dissection.

This report describes the successful management of a pseudoaneurysm of the gastroduodenal artery following radical gastrectomy, by ligation of the bleeding vessel.

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