AN UNCOMMON COMPLICATION AFTER ROBOTIC DISTAL PANCREATECTOMY THAT REQUIRED EMERGENCY SURGERY

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CASE REPORT

Doi: 10.33695/rojes.v4i1.59
Accepted: 02.04.2022

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Abstract

Pancreatic resections are complex surgical procedures that can be marked by complications during operative or postoperative time. In order to prevent some of the complications different approaches have been used including minimal invasive approach (MIP). In the past decade robot assisted pancreatic surgery gained progress with regard to less surgical trauma, rapid recovery, less estimated blood loss, less wound infection and less incisional hernia with similar oncologic outcomes and survival rate to open approach. However, robotic pancreatic surgery is not free of complications like postoperative pancreatic fistula or fluid collection. We present the case of a 27-year-old female patient diagnosed with voluminous pancreatic cyst where robot assisted distal pancreatectomy with intention of spleen preserving was performed.

Keywords: robotic surgery, distal pancreatectomy, complication, cystic pancreatic neoplasm

Introduction

Pancreatic surgeries including pancreaticoduodenectomy (PD) and distal pancreatectomy (DP) are elaborate abdominal surgeries associated with morbidity (35%) and mortality (2%) [1,2]. Although distal pancreatectomy exhibits less morbidity than pancreaticoduodenectomy, it still remains a major surgery associated with 30-50% risk of complications [3]. In the past years, minimally invasive approach gained progress in the pancreatic surgery field with regard to less surgical trauma, rapid recovery, less estimated blood loss, less wound infection and less incisional hernia with similar oncologic outcomes and survival rate to open approach [3,4]. Several studies suggested that minimally invasive techniques using laparoscopic distal pancreatectomy (LDP) and robotic assisted distal pancreatectomy (RADP) could improve intraoperative outcomes by reducing the blood loss, increasing the chances of spleen preserving, accelerate recovery and shorten hospital stay [5,6]. Despite laparoscopy provides a magnified view, dissection in the retroperitoneal spaces is usually difficult because limited range of motions. Compared to LDP, RADP displays some advantages like increased magnification and range of motion,

reducing conversion rate and increasing spleen preserving rates [7].

However, RADP is not free of complications: postoperative pancreatic fistula (POPF) is a common complication after distal pancreatectomy, which could range from asymptomatic to fatal [8]; several studies emphasized that the major factors related to postoperative pancreatic fistula were thickness and texture of the pancreatic stump, but not the surgical approach [9,10].

Case presentation

We present the case of a 27-year-old female patient diagnosed 3 years prior presentation with voluminous pancreatic cyst for which echoendoscopy with complete needle aspiration was performed displaying no elements of malignancy, was referred to our unit for surgical treatment after liquid content restoration.

Contrast enhanced abdominal MRI revealed pancreas with normal dimensions and position presenting at the tail level a well delimited cyst by a relatively uniform wall of up to 5 mm, with several septa included (peripheral), with diameters of 62/54/78 mm, without diffusion restriction or contrast intake, without solid components included, exerting a compressive effect on neighboring structures and inclusion of the splenic vascular bundle (Figure 1).

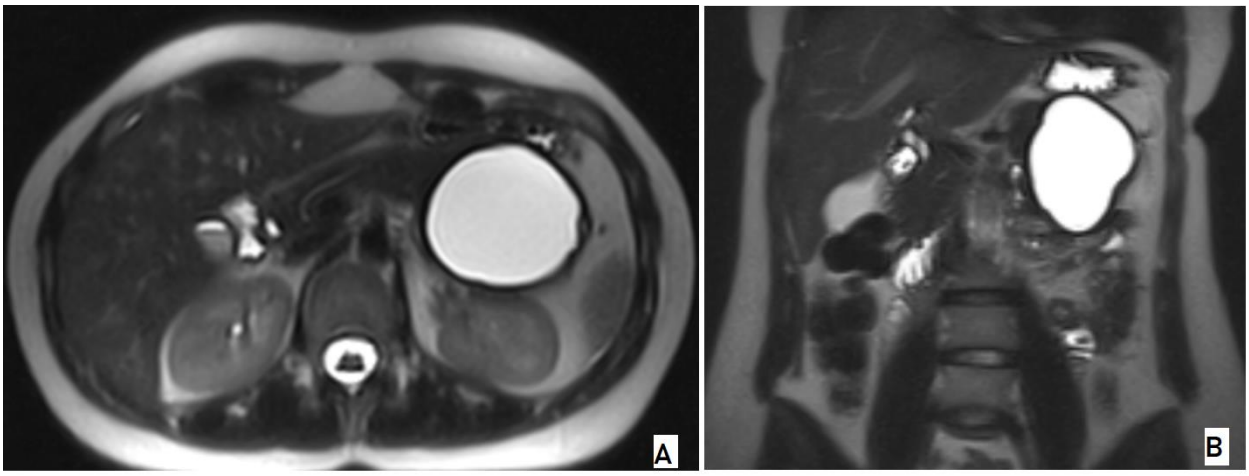

Figure 1 - Contrast enhanced abdominal MRI showing pancreatic cyst

Patient underwent surgical intervention and robotic assisted distal pancreatectomy with intention of spleen preserving was performed. Intraperitoneal exploration highlights voluminous pancreatic tail cyst exerting compressive effect on neighboring structures (duodenum) with inclusion of the splenic vascular bundle (Figure 2), therefore Warshaw method with splenic vessels stapling was performed. Also, the dissection of the cyst from the duodenum was difficult (Figure 3).

The pancreatic tail *en bloc* with the cyst was transected with stapling device. Spleen reexploration highlights spleen half infarcted, consequently splenectomy was performed. The histopathological examination of the specimen revealed mucinous cystic pancreatic neoplasm (MCPN) with negative resection margins with 17 reactive lymph nodes.

On the 7th post operatory day, after a favorable evolution, with the resumption of oral feeding, enteral drainage occurs. Oral and intravenous contrast abdominal computed tomography highlights extravasation of the contrast substance through a 3 mm diameter orifice at duodenum IV level with hydroaeric collection of 4/6/7cm diameter (Figure 4).

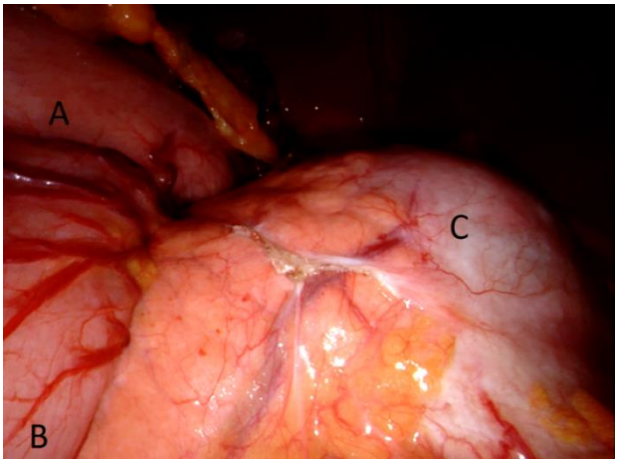

Figure 2 - Intraperitoneal exploration: A – Stomach; B – Duodenum; C – Voluminous cyst at the pancreatic tail

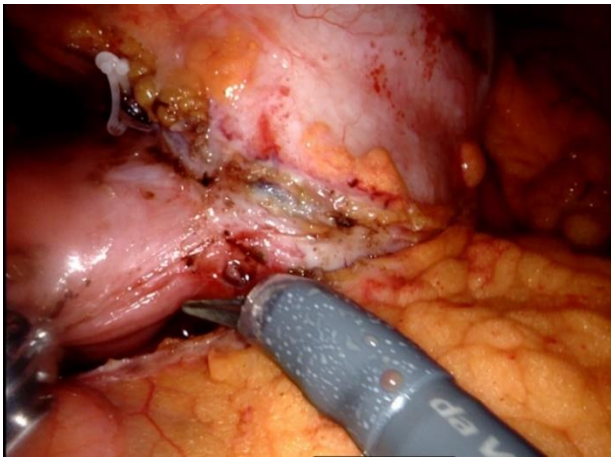

Figure 3 - Robot assisted disection at the duodenum level

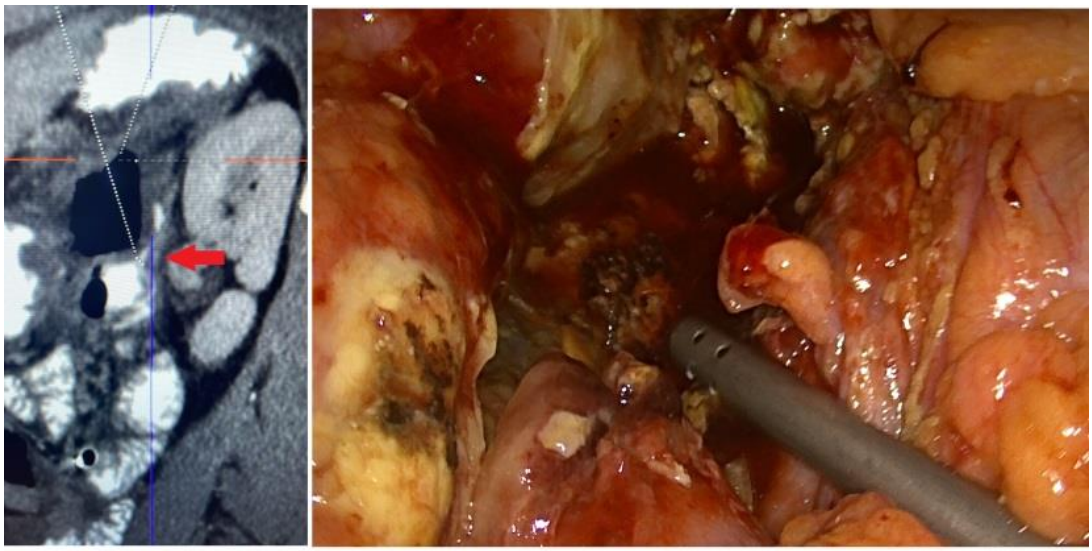

Figure 4 - Oral and intravenous contrast abdominal CT highlights extravasation of the contrast substance through a 3 mm diameter orifice at duodenum IV level evidenced laparoscopically

Emergency exploratory laparoscopy was performed displaying supra-mesocolic peritonitis due to postoperative duodenal perforation, therefore laparoscopic duodenorraphy and drainage was practiced.

Postinterventional course evidenced perpetuation of the enteral drainage, initially with a flow rate of 500 ml per day, gradually decreasing <100 ml daily, with resumption of oral feeding.

Control computed tomography performed one month after the re-intervention highlights a retrogastric collection (in the vicinity of the drain tube) without any loss of substance at the digestive tract levels (Figure 5). The patient is discharged after 35 days of hospitalization with drain tube in place. Another control computed tomography was performed showing complete resorption of the retrogastric collection and no loss of substance at the digestive tract.

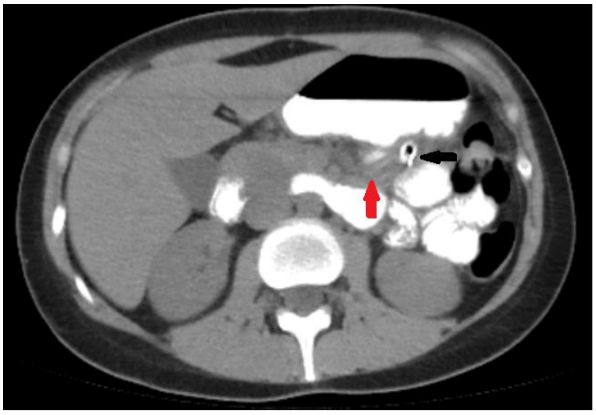

Figure 5 - Control CT highlights a retrogastric collection (red arrow) in the vicinity of the drain tube (black arrow) without any loss of substance at the digestive tract

Discussions

Regarding immune and hematological function of the spleen, in order to reduce the risk of infection disease, thromboembolism and hematological malignancy, spleen preservation is advocated in distal pancreatectomy [11,12].

There are two main techniques of splenic surgery: the Kimura technique with preservation of splenic vessels and the Warshaw technique with excision of splenic vessel, but with preservation of gastric vessels [13,14]. Chen et al. [15] reported that spleen preservation in patients having distal pancreatectomy was higher in the robotic assisted technique compared to laparoscopic technique (95,7% vs 39,4), and Kimura technique was used in 75,6% patients. In a meta-analysis conducted by Xu S-B et al [16], spleen preserving rate of RADP was similar to LDP, but splenic vessels conservation rate was higher in the RADP group. The RADP benefits from 3D magnification and more flexibility, which contribute in the process of separating the pancreatic parenchyma from splenic vessel, reducing the risk of bleeding [17].

Postoperative pancreatic fistula is the most prevalent complication after distal pancreatectomy which could range from asymptomatic to fatal [8]. Most studies demonstrated that the incidence and of POPF grade B/C and 90-day mortality did not differ significantly in the RADP group comparing to LDP [16, 18, 19]. Comparing to open techniques, LEOPARD study [3] reported an increased incidence of grade B/C pancreatic fistula after MIPD compared to open techniques, but no difference in the overall need of percutaneous drainage was seen. Some studies [9,10] noted that a major factor related to POPF is the thickness and texture of the pancreatic stump, others [19] emphasized the surgical cutting line may contribute to POPF suggesting that using a cutting linear stapler was smoother and the incidence of bleeding and pancreatic fistula was lower.

Fluid collections (FC) at the resection margins of the pancreatic stump after DP are common radiological findings in the follow up and only 9% require therapeutic intervention [20]. Given the high level of pancreatic enzymes in FCs, their evolution is attributed to a subclinical and self-limiting leakage of pancreatic juice. Sierzega et al [21] reported one-four of patients developed FC after DP and about half of cases were asymptomatic and self-limiting. Some studies concluded that high BMI, male sex, concomitant splenectomy are risk factors to the occurrence of FC [22].

RADP seems to offer similar clinic and oncological results compared to other DP techniques, although it may require longer operating time and learning curve. Robotic pancreatic surgery is still in its infancy and most centers are still in the learning curve. Boone et al [23] reported that the amount of blood loss and incidence of postoperative pancreatic fistula are improved after 20,40 and 80 cases of RADP. Also, the operative time may be significantly reduced after completing the learning curve of 10 RAPD [24].

For this case particularly, we believe the duodenal fistula was a consequence of the summation of two factors: the difficult

dissection of the tumor from the duodenum wall and the existence of a grade A POPF.

Conclusions

RADP overcame the shortcomings of other distal pancreatectomy approaches reducing intraoperative bleeding, improving spleen preserving rate, reducing postoperative pain and accelerate postoperative recovery with similar oncologic outcomes. However, RADP is not free of complications. Most complications can be prevented by overcoming the learning curve.

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