Case Report

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Varicose vein embolization and portal vein stenting in a patient with sinistral portal hypertension-induced gastrointestinal hemorrhage: a case report

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Introduction and importance: Massive gastrointestinal hemorrhage is a severe hemorrhage that occurs in the gastrointestinal tract and is a life-threatening condition. Sinistral portal hypertension is a common etiology for massive gastrointestinal hemorrhage, whose occurrence might be derived from pathological changes induced by obstruction and/or increased blood flow to the portal vein system. However, there is a rare study reporting pancreatic disease-induced sinistral portal hypertension.

Case presentation: An 80-year-old female pancreatic cancer patient was admitted to our hospital on 22 January 2022 due to a massive gastrointestinal hemorrhage with shock after receiving radio-chemotherapy. Abdominal enhanced computerized tomography showed that the patient presented with pancreatic cancer-causing sinistral portal hypertension with massive collateral circulation, intrahepatic bile duct dilation, and the formation of massive ascites. Subsequent portography interventional procedure revealed the esophageal and gastric varix. Then, the varicose vein was embolized, and the stent was implanted at the lumen of the superior mesenteric vein accessing the portal vein. The patient recovered from pancreatic cancer-causing sinistral portal hypertension, and a normal direction of blood flow was observed in the superior mesenteric vein with a decreasing amount of ascites. In addition, a transfusion was also carried out, and the massive gastrointestinal hemorrhage was alleviated.

Clinical discussion and conclusion: This study emphasizes the successful treatment of massive gastrointestinal hemorrhage induced by pancreatic cancer-causing sinistral portal hypertension by varicose vein embolization and portal vein stenting, which could be considered an alternative opinion for these patients.

Keywords: pancreatic cancer-causing sinistral portal hypertension, pancreatic cancer, massive gastrointestinal hemorrhage, embolization, ascites

Introduction

Massive gastrointestinal hemorrhage is a severe hemorrhage that occurs in the gastrointestinal tract and is a life-threatening condition[1–3]. The prognosis of patients with massive gastrointestinal hemorrhage is unsatisfactory, with mortality ranging from 3 to 14% and an enormous disease burden (such as hemorrhage complications: infection, etc.)[1,4]. Therefore, it is necessary to determine the etiology of gastrointestinal hemorrhage in a timely manner and apply the corresponding treatment strategy. There are several pathological changes that are regarded as the aetiologies of massive gastrointestinal hemorrhage, such as digestive ulcers, varicosity, and tumors. Sinistral portal hypertension is one of the reasons for inducing varicosity and further leading to gastrointestinal hemorrhage, which has been previously reported in serval case reports, while their etiology mainly concentrates on pancreatic pseudocyst and gastric artery pseudoaneurysm formation[5–7]. The current study reported a rare case of massive gastrointestinal hemorrhage induced by pancreatic cancer-causing sinistral portal hypertension, which was successfully treated by varicose vein embolization and portal vein stenting. This case report has been reported in line with the Surgical CAse REport (SCARE) criteria[8].

HIGHLIGHTS

- Timely finding out the etiology of the gastrointestinal hemorrhage may be lifesaving.
- Massive gastrointestinal hemorrhage induced by pancreatic cancer-causing sinistral portal hypertension is scarce.
- Varicose vein embolization and portal vein stenting could relieve this pancreatic cancer-causing sinistral portal hypertension.

Case presentation

An 80-year-old female pancreatic cancer patient was admitted to our hospital on 22 January 2022 due to a massive gastrointestinal hemorrhage with shock after receiving radio-chemotherapy. She had a history of diabetes, hypertension, and coronary heart disease; in addition, she had been implanted with coronary stents and

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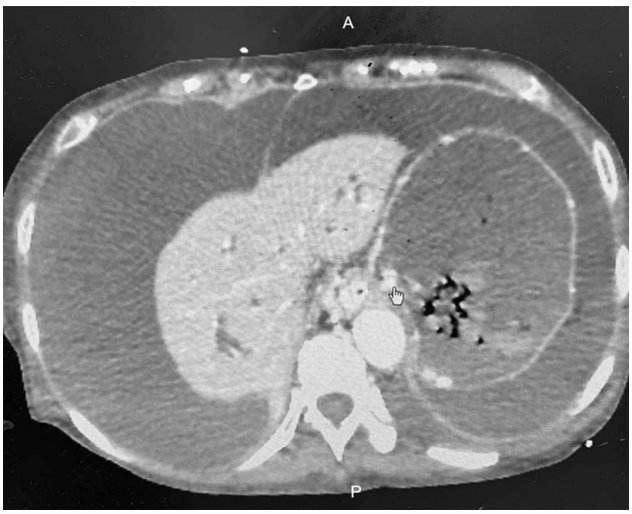

Figure 1. Image of abdominal enhanced computerized tomography at admission.

pacemakers. At admission (on 22 January 2022), her white blood cell count was 13.16×10^9/l (with a normal range of $4.0–10.0\times10^9$/l); her neutrophil granulocyte count was 11.26×10^9/l (with a normal range of $2.0–7.5\times10^9$/l); her erythrocyte count was 1.97×10^{12}/l (with a normal range of $3.8–5.5\times10^{12}$/l); her hemoglobin level was 58 g/l (with a normal range of 110–170 g/l), and her hematocrit was 17.2% (with a normal range of 37–56%). The indexes of liver and kidney functions revealed that the total bilirubin was 62 g/l (with a normal range of 0.1–1.0 g/l). Then, abdominal enhanced computerized tomography was performed, which showed that the patient presented with pancreatic cancer-causing sinistral portal hypertension with massive collateral circulation and intrahepatic bile duct dilation and the formation of massive ascites (Fig. 1).

On the same day of admission (on 22 January 2022), a portography interventional procedure was performed (Fig. 2A), which disclosed an obvious esophageal and gastric varix (Fig. 2B–C). Therefore, embolization of the varicose veins was carried out. In detail, the catheter was inserted into the superior mesenteric vein for imaging development, and it revealed that after embolization, stenosis could be observed at the lumen of the superior mesenteric vein accessing the portal vein; in addition, reversed blood flow could be observed in the superior mesenteric vein (Fig. 3A). Hence, the stent was implanted to alleviate the stenosis at the same time on 22 January 2022. After that (on 22 January 2022), the image disclosed that the stenosis was recovered; in addition, the blood flow returned to the normal direction in the superior mesenteric vein. The superior mesenteric vein pressure decreased from a 37 cm water column before the operation to only a 23 cm water column postoperatively. On the first day after surgery, the 24 h urine volume increased from 700 ml preoperatively to 2100 ml postoperatively under the condition of diuretic halving (20 mg furosemide) (Fig. 3B). The amount of ascites also decreased after stent implantation.

To alleviate the massive gastrointestinal hemorrhage, a transfusion was also carried out on the same day (on 22 January 2022). On the second day after admission (on 23rd January 2022), routine blood examination and physical examination showed that the hemoglobin was elevated to 92 g/l, and the melena disappeared after transfusion. These findings indicated that the gastrointestinal hemorrhage was alleviated.

Discussion

Sinistral portal hypertension is a complication that can occur during the treatment of pancreatic disease[9,10]. Many studies have reported the etiology of sinistral portal hypertension[10–13]. For instance, a review reported that neoplasia, pancreatitis, trauma, pseudocysts, infection, and miscellaneous could induce the splenic vein, which further causes sinistral portal hypertension[12]. Another study also discovered this issue, which revealed that pancreaticoduodenectomy with splenic vein resection might also be another pathogenic factor for sinistral portal hypertension[10]. In this study, we present an 80-year-old woman who presented with pancreatic cancer-causing sinistral portal hypertension, and we speculated that the cause of this sinistral portal hypertension might be the compression of pancreatic cancer on the splenic vein, which led to the obstruction of the splenic vein; therefore, sinistral portal hypertension was further observed. This etiology of sinistral portal hypertension was seldom reported in previous studies. In a previous study, the main etiology of sinistral portal hypertension in pancreatic disease mainly included pancreatitis and pancreaticoduodenectomy with splenic vein resection[12].

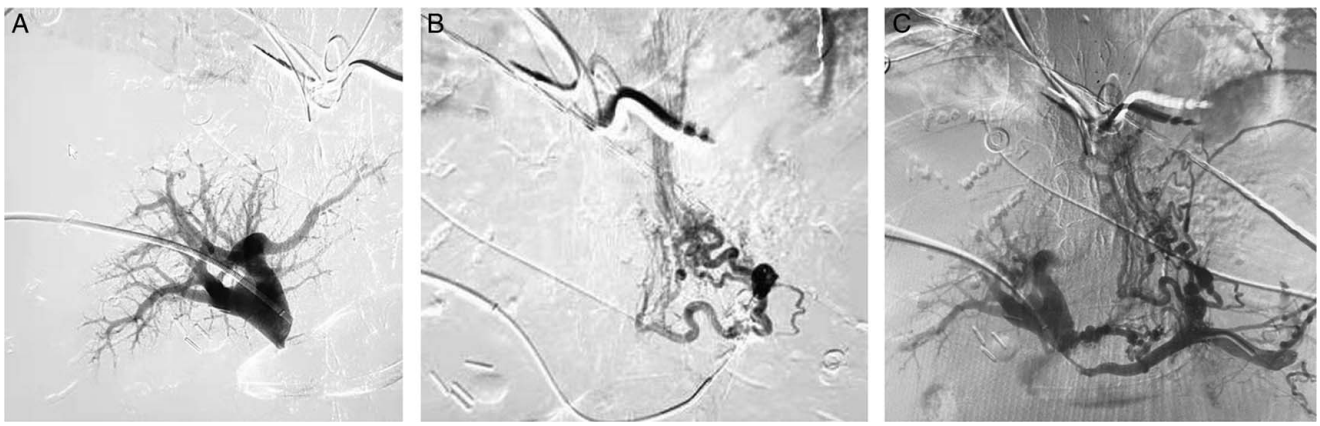

Figure 2. Image of portography intervention. The portography interventional procedure (A); Image of esophageal and gastric varix (B, C).

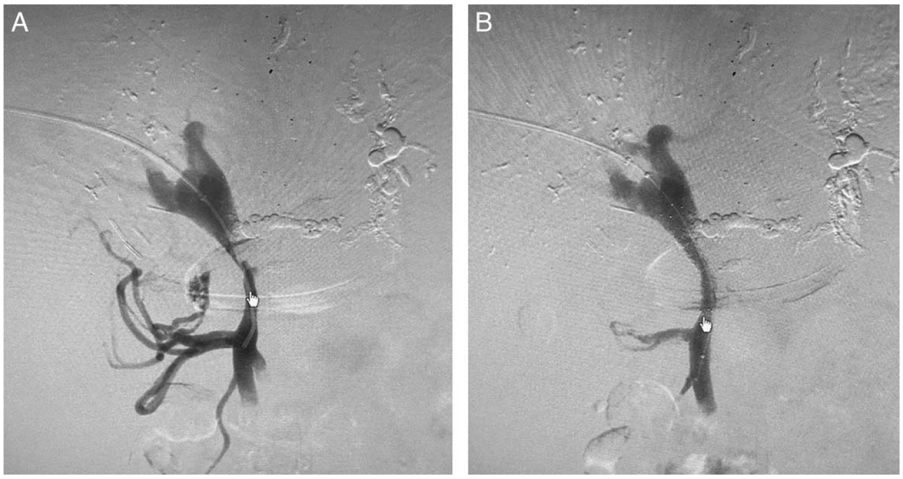

Figure 3. Image after embolization for the varicose veins and after implantation of the stent. After embolization of the varicose veins, stenosis could be observed at the lumen of the superior mesenteric vein accessing the portal vein (A). After implanting the stent at the stenosis site, stenosis is recovered; the blood flow returns to the normal direction in the superior mesenteric vein (B).

Hence, this study should alert oncologists and gastroenterologists that the occurrence of sinistral portal hypertension should be vigilant; once it occurs, a timely deposition should be carried out to prevent the occurrence of a worse prognosis, such as gastrointestinal hemorrhage.

As previously described, the prognosis of sinistral portal hypertension is poor. For instance, some studies have reported that sinistral portal hypertension could induce pancreatic adenocarcinoma[14,15]. Another study discloses that sinistral portal hypertension could lead to gastric variceal hemorrhage[16]. Therefore, the timely management of sinistral portal hypertension is important[17,18]. Previous studies have attempted to use various methods to treat sinistral portal hypertension. One study used a two-step complete splenic artery embolization to manage sinistral portal hypertension[19]. Another study used preoperative splenic artery embolism followed by splenectomy in treating patients with sinistral portal hypertension[18]. However, studies on the management of massive gastrointestinal hemorrhage induced by pancreatic cancer-causing sinistral portal hypertension are limited. In this study, we first embolized the varicose veins, and then we implanted the stent to alleviate stenosis at the lumen of the superior mesenteric vein accessing the portal vein. The reason for the selection of varicose vein embolization was as follows: the enhanced image showed that the main portal vein, splenic vein, and superior mesenteric vein were all involved; hence, the application of varicose vein embolization could relieve hemorrhage symptoms. Second, the reason for portal vein stenting was as follows: computerized tomography showed that the patient had many ascites, the maximum depth of ascites was ~9 cm, and the reason for the ascites was that there was stenosis in the superior mesenteric vein into the main portal vein. To solve this stenosis, portal vein stenting is carried out. Then, this patient was alleviated from sinistral portal hypertension; the massive gastrointestinal hemorrhage and ascites were also relieved. Therefore, the treatment strategy proposed in this study showed efficacy in relieving the symptoms of patients with massive gastrointestinal hemorrhage induced by pancreatic cancer-causing sinistral portal hypertension, which deserves to be considered in treating these patients. However, due to the low incidence of this disease, it was difficult to validate the effectiveness of the treatment method recently. In the future, we decided to carry out a cohort study to validate the effectiveness of our treatment method.

Conclusion

The current study emphasizes the successful treatment of massive gastrointestinal hemorrhage induced by pancreatic cancer-causing sinistral portal hypertension by varicose vein embolization and portal vein stenting; this therapeutic method could be considered an alternative treatment option for these patients. However, because this study is only a case report, it is difficult to make a solid conclusion; hence, further cohort studies are still needed to validate the effectiveness of our treatment method.

Ethical approval

The ethics approval is not required for case reports deemed not to constitute research at our institution, the name of our institution is: Hospital of Chengdu University of Traditional Chinese Medicine.

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

Y.L.: contributed to the conception and the design of the study; X.L. and W.L.: were responsible for the acquisition, analysis, and interpretation of the data; Y.W.: analyzed and interpreted the

patient's clinical data and contributed to writing the manuscript. All authors have read and approved the final manuscript.

Conflicts of interest disclosure

The authors declare that there is no conflict of interest.

Research registration unique identifying number (UIN)

Not applicable.

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Provenance and peer review

Our paper was not invited.

Data availability statement

The authors declared that datasets were available upon reasonable request.

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