

Surgical Treatment of Superior mesenteric Artery Pseudoaneurysm

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Abstract

Arteria mesenterica superior pseudoaneurysm is a rare disease that may be caused by iatrogenic damage to the superior mesenteric artery pseudoaneurysm in pancreaticoduodenal surgeries, trauma, inflammatory processes in the abdominal cavity. The paper presents a case report of surgical treatment for arteria mesenterica superior pseudoaneurysm. Surgical resection of superior mesenteric artery pseudoaneurysm was performed. The patient's postoperative course was complicated by arteria mesenterica superior occlusion; arterial reconstruction was performed :iliaco-mesenteric bypass using the great saphenous vein with subsequent segmental resection of the jejunum. A research case study indicated the complexity of the pathology such as visceral artery pseudoaneurysm at the stage of diagnosing as well as at the stage of selecting treatment tactics. Visceral organ ischemia is one of the severest complications in the postoperative period which can make the diagnosis difficult as well as complicating the selection of treatment tactics.

Keywords: Visceral artery pseudoaneurysm; Visceral artery aneurysms; Rupture risk; Hemorrhage; visceral ischemia.

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Introduction

Superior mesenteric artery pseudoaneurysm is a rare pathology being of great clinical significance due to a high risk of hemorrhage [1]. As regards to treatment strategy for visceral pseudoaneurysms, traditional surgical treatment is currently used and the possibilities of endovascular treatment for visceral artery pseudoaneurysms are successfully developed

[2,3]. The selection of treatment strategy depends on the patient's clinical condition, etiologic factor, anatomic features of the visceral arteries and pseudoaneurysm localization [4,5].

Case report

A 57-year-old patient complaining of general weakness, mild epigastric pain and diarrhea was

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hospitalized to the 1st Department of Surgery. As indicated in the medical history, the patient had undergone pancreaticoduodenal resection due to tumor of the pancreatic head ;3 weeks before she was hospitalized. Abdominal ultrasound showed hypochoic fluid collection measuring 5 x 2.5 x 1.5 cm in size in the epigastric region. In order to specify the diagnosis, CT angiography of the abdomen was ordered. The results confirmed pseudoaneurysm of superior mesenteric (Fig. 1 A, B).

Considering the patient's clinical condition, namely the presence of superior mesenteric artery pseudoaneurysm which was confirmed using CT angiography, vascular surgeon recommended surgical resection of superior mesenteric artery pseudoaneurysm. The patient underwent planned laparotomy, surgical resection of superior mesenteric artery pseudoaneurysm. The patient's postoperative course was complicated; on the second day after surgery, diffuse abdominal pain was detected; the signs of peritoneal irritation were weakly positive. Urgent CT angiography of the abdomen which revealed superior mesenteric artery occlusion was performed. Considering acute intestinal ischemia, urgent relaparotomy and surgical revision were performed. The surgical revision revealed superior mesenteric artery occlusion at the site of pseudoaneurysm resection. We have decided to perform arterial reconstruction: iliaco-mesenteric bypass using the great saphenic vein (Fig. 2). Due to the inability to clearly assess the viability of the small intestine, the abdomen was left open for planned second look operation for 8 hours; then, surgical revision of the small intestine was performed. Necrotic segment of the jejunum was detected. Segmental resection of the jejunum (70-80 cm) was performed. The postoperative course was uneventful;

antiinflammatory, detoxication and antiplatelet therapy was prescribed.

Discussion

Pancreatitis, traumas, postoperative complications, peptic ulcers, iatrogenic damage to the visceral arteries are considered as the possible causes of visceral pseudoaneurysm development [6,7]. Considering a high risk of pseudoaneurysm rupture, surgical intervention is recommended for all the patients in the shortest possible time [2]. The selection of treatment strategy depends on pseudoaneurysm localization and topography of the arteries [3]. The development of endovascular technologies allowed expanding the possibilities of treating this pathology [4,8].

This case report is interesting due to a typical clinical course of visceral pseudoaneurysm, the value of the diagnostic criteria obtained by means of US and CT angiography, the complexity of treatment tactics as well as surgeon volume selection and the importance of timely relaparotomy in intestinal ischemia.

In our case, the clinical picture was modified by a specific feature of the postoperative course (changes in the trajectory of the gastrointestinal contents passage after pancreaticoduodenal resection, adhesions, significant surgeon volume). This case confirmed that in severe postoperative course the possibility of iatrogenic damage to the visceral arteries should be considered, even if surgery was uneventful. The importance of ultrasound investigation in the postoperative period should be noted. If any fluid collection is detected, it is necessary to make a differential diagnosis with the detection or exclusion of an active arterial or venous blood flow. If in the abdominal cavity

any abnormal masses are detected, CT using intravenous bolus contrast medium injection is an objective diagnostic method.

When selecting treatment strategy in our case, it was not possible to apply endovascular treatment due to altered anatomic and topographic parameters after surgical intervention and clinical signs of peritoneal irritation which were the indications for surgical revision. The only method of choice was surgical resection of the superior mesenteric artery. Surgery was difficult to perform due to severe adhesions after previous laparotomy. Superior mesenteric artery pseudoaneurysm was visualized intraoperatively; its resection with the restoration of superior mesenteric artery blood flow was performed. However, on the second day after surgery, superior mesenteric artery occlusion was diagnosed. Pronounced infiltrative changes in the pancreaticoduodenal region most likely led to the compression and occlusion of the superior mesenteric artery. Intestinal ischemia in the postoperative period is an unfavorable prognostic criterion and quick recognition of the patient's clinical condition is the key to successful treatment [9]. The confirmation of the diagnosis of mesenteric ischemia is a direct indication for urgent surgery [10].

We performed urgent reoperation and arterial reconstruction: iliaco-mesenteric bypass.

Due to difficulties in assessing the viability of the small intestine during surgery we have decided to leave the abdomen open for planned second look operation in 8-10 hours in order to perform surgical revision of small intestinal viability.

In repeated surgical revision, due to necrotic changes in the small intestine, segmental resection of the jejunum (70-80 cm) was performed.

The doubts regarding the exact determination of small intestinal viability often make the surgeon apply minimal surgical intervention (resection of necrotic segment) and delayed, repeated revision of the intestine [5].

At the same time, there is practically no alternative to surgical treatment of patients with mesenteric ischemia [8]. The factor of acute intestinal ischemia duration plays an extremely important role in predicting successful surgical treatment of patients with mesenteric ischemia [10]. Therefore, medical staff must pay close attention to clinical signs of acute intestinal ischemia, especially in patients who underwent visceral artery reconstruction.

Conclusions

Superior mesenteric artery pseudoaneurysm may be caused by iatrogenic arterial injury in pancreaticoduodenal surgeries. Every patient with confirmed visceral pseudoaneurysm must be operated as soon as possible due to a high risk of hemorrhage. In visceral artery reconstructions, the potential risk of visceral artery occlusion as well as the development of acute mesenteric ischemia should be considered. Acute intestinal ischemia requires emergency surgery which aims at the revascularization of the intestine, the assessment of intestinal viability and segmental resection of the intestinal segment if it is necrotic.

Figure



Fig.1: A, B: CT scan of superior mesenteric artery pseudoaneurysm

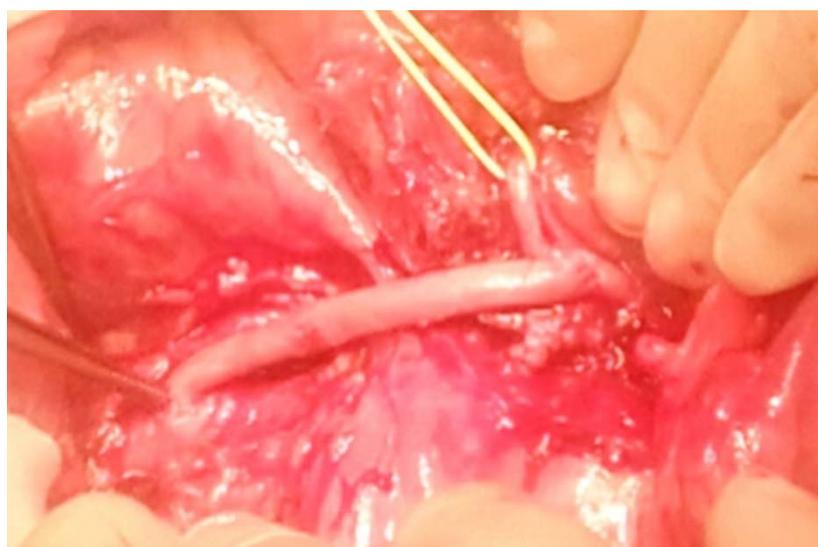


Fig. 2: Iliaco-mesenteric bypass using the great saphenic vein

References

1. Christensen T, Matsuoka L, Heestand G, Palmer S, Mateo R, Genyk Y, Selby R, Sher L. Iatrogenic pseudoaneurysms of the extrahepatic arterial vasculature: management and outcome. *HPB (Oxford)*. 2006;8(6):458-64. doi:10.1080/13651820600839993.
2. Sanchez Arteaga A, Orue-Echebarria MI, Zarain L, Lusilla A, Martinez CM, Moreno A, Cuadrado M, Rey C, Perez Diaz MD, Leyte MG, Turégano FJ. Acute bleeding from pseudoaneurysms following liver and pancreatobiliary surgery. *Eur J Trauma Emerg Surg*. 2016 Apr 21.
3. Regus S, Lang W. Rupture Risk and Etiology of Visceral Artery Aneurysms and Pseudoaneurysms: A Single-Center Experience. *Vasc Endovascular Surg*. 2016 Jan;50(1):10-5. doi: 10.1177/1538574415627868.
4. Cordova A. C., Sumpio B. E. Visceral artery aneurysms and pseudoaneurysms - should they all be managed by endovascular techniques? *Ann. Vasc. Dis*. 2013; 6 (4): 687–693.
5. Kubíková M., Sihotský V. Komplikácie v cievnej chirurgii. Princípy chirurgie IV. Bratislava: SAP, 2015; S. 570-578. ISBN 9788089607372.
6. Luckhurst CM, Perez C, Collinworth AL, Trevino JG. Atypical presentation of a hepatic artery pseudoaneurysm: A case report and review of the literature. *World J Hepatol*. 2016 Jun 28;8(18): 779-84. doi: 10.4254/wjh.v8.i18.779.
7. Nwafor IA, Eze JC, Ezemba N, Ngene CI, Akpan AF. Giant pseudoaneurysm of a splanchnic artery; a case report. *Niger J Med*. 2015 Jul-Sep;24(3):268-72.
8. Barr J, Kokotsakis J, Tsipas P, Papapavlou P, Velissarios K, Kratimenos T, Athanasiou T. Ascending Aorta to Hepatic and Mesenteric Artery Bypassing, in Patients with
9. Chronic Mesenteric Ischemia and Extensive Aortic Disease-A Case Report and Review of the Literature. *Ann Vasc Surg*. 2016 Nov 28. pii: S0890-5096(16)31273-0. doi: 10.1016/j.avsg.2016.08.036.
10. Savlania A1, Tripathi RK. Acute mesenteric ischemia: current multidisciplinary approach. *J Cardiovasc Surg (Torino)*. 2016 Nov 30.
11. Renner P, Kienle K, Dahlke MH, Heiss P, Pfister K, Stroszczyński C, Piso P, Schlitt HJ. Intestinal ischemia: current treatment concepts. *Langenbecks Arch Surg*. 2011 Jan;396(1): 3-11. doi: 10.1007/s00423-010-0726-y. Epub 2010 Nov 12.

العلاج الجراحي لـ "أم الدم الكاذبة" للشريان المساريقي العلوي

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الملخص

يعد مرض "أم الدم الكاذبة" في الشريان المساريقي العلوي مرضاً نادراً قد يكون علاجي المنشأ نتيجة جراحة على الشريان البينكرياسي-الاثني عشري، أو إصابة مباشرة، أو التهاب في تجويف البطن. يعرض هذا البحث تقريراً عن العلاج الجراحي لحالة من "أم الدم الكاذبة" في الشريان المساريقي العلوي. تعرض المريض لانسداد الشريان المساريقي العلوي كإحدى مضاعفات العملية الجراحية، وأجريت له عملية استئناء لتجاوز الانسداد بإيصال الشريان الحرقفي مع المساريقي باستخدام الوريد الصافن الكبير وتلى ذلك استئصال جزء من الصائم. أظهرت هذه الحالة صعوبة التشخيص والعلاج في مثل هذه الحالة وأن نقص تروية الأحشاء هي أشد المضاعفات التي قد تحدث مابعد العملية الجراحية وقد تجعل التشخيص أكثر صعوبة وكذلك اختيار طريقة العلاج.

الكلمات الدالة: تمدد الاوعية الكاذبه في الشريان الحشوي تمدد الاوعية في الشريان الحشوي، خطر التمزق، نزيف، نقص الترويه الحشوي.