



Images in surgery

Operative treatment of portal vein aneurysm

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Case presentation

A 23-year-old healthy female was incidentally diagnosed with a fusiform 3.3 × 2.3 cm portal vein (PV) aneurysm involving the superior mesenteric vein (SMV) during work-up of pelvic pain, Fig. 1. Four years later (2022) she was referred to the surgery clinic with intermittent epigastric abdominal pain and 10-pound weight loss. Trial of acid-suppression therapy failed to resolve symptoms. Cross-sectional imaging demonstrated interval enlargement of her PV aneurysm to 4.2 × 3.5 cm, Fig. 1. She elected to undergo operative intervention for her PV aneurysm.

What is the operative management of this patient's fusiform PV aneurysm?

- A. Portal vein aneurysmorrhaphy
- B. Portal vein aneurysmectomy
- C. Shunt
- D. Liver transplant

Portal vein aneurysmorrhaphy was performed, Fig. 2. Dissection in the porta hepatis allowed vascular control of the PV (Fig. 2A). The SMV and splenic vein (SV) were controlled with dissection along the caudal border of the pancreas (Fig. 2B). After mobilizing the posterior surface of the pancreas from the mesenteric veins, the PV aneurysm was opened and aneurysmorrhaphy was performed with running 4-0 polypropylene suture (Fig. 2C). The vein's aneurysmal wall was buttressed over the repair (Fig. 2D). Postoperative day one she was started

on 81 mg aspirin which was continued for one month. She was discharged uneventfully on postoperative day four. At her postoperative visit, mesenteric duplex ultrasound demonstrated normal PV flow and a PV diameter of 12 mm. Long-term follow-up will include serial mesenteric duplex ultrasound.

Discussion

Portal vein aneurysms are rare with around 200 cases reported in the literature since initially described in 1956 [1,2]. Aneurysms of the PV are typically associated with cirrhosis and portal hypertension [2]. Rarer etiologies include trauma, congenital malformation, severe acute pancreatitis, and malignant invasion of the PV². Defined as PV diameter > 19 mm in cirrhosis and > 15 mm in healthy livers, PV aneurysms present as non-specific abdominal pain in ~50% of patients [2]. Thrombosis of the PV is seen in up to 20% of patients while spontaneous rupture is rare but reported [3]. Surgical intervention is reserved for symptomatic/enlarging aneurysms, thrombosis, or rupture; however, the operative approach must be tailored to the individual patient [2].

Treatment guidelines for PV aneurysms rely on review of the limited available case reports [2]. Asymptomatic PV aneurysms are observed with serial imaging, symptomatic aneurysms associated with cirrhosis are treated with operative shunting/bypass or liver transplant, and aneurysmorrhaphy/aneurysmectomy is performed in patients with healthy livers [2]. Selection of aneurysmorrhaphy or aneurysmectomy is dependent on whether the aneurysm is fusiform or saccular, respectively [4]. Perioperative anticoagulation/antiplatelet therapy after PV reconstruction remains a topic of debate with little evidence to guide management. Postoperative mortality after shunt/bypass procedures or liver transplant ranges from 22 to 50%, owing to the underlying liver disease in these patients [2]. Aneurysmorrhaphy/aneurysmectomy is performed safely in experienced centers with reported postoperative mortality of 0% [2]. Recurrence is low; however, accurate assessment of recurrence rates is limited by short-term follow-up².

Conclusions

Portal vein aneurysm is a rare entity. Treatment is guided by case reports and limited case series. As in this case, available literature suggests that aneurysmorrhaphy/aneurysmectomy may be performed safely in healthy patients at experienced centers.

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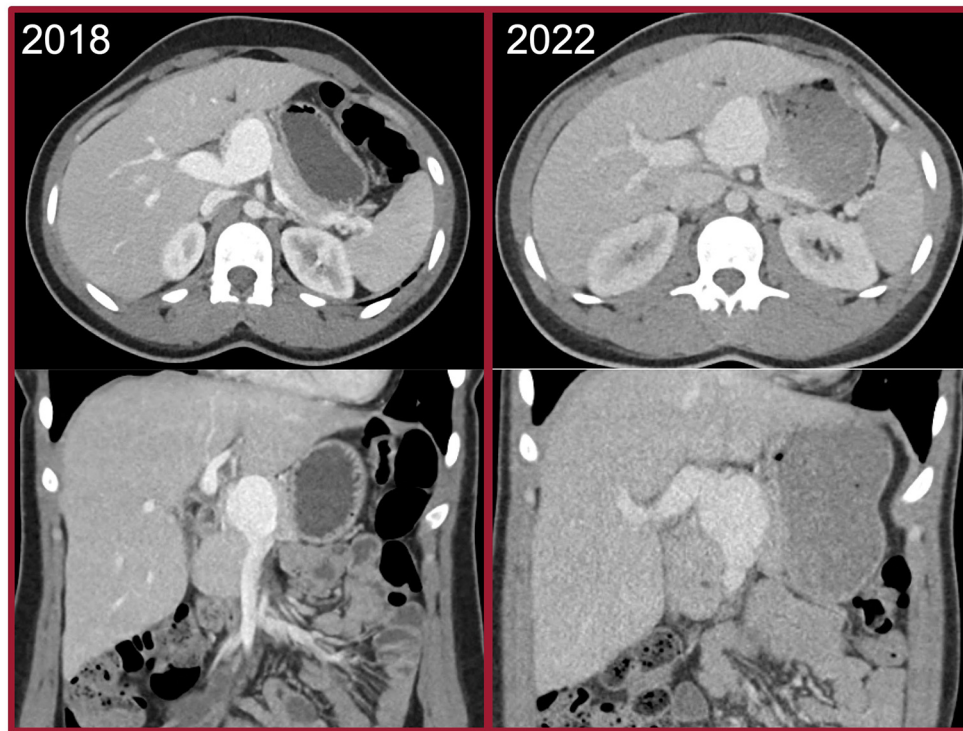


Fig. 1. Superior mesenteric vein/portal vein aneurysm measuring 3.3 × 2.3 cm (left); aneurysm measuring 4.2 × 3.5 cm (right).

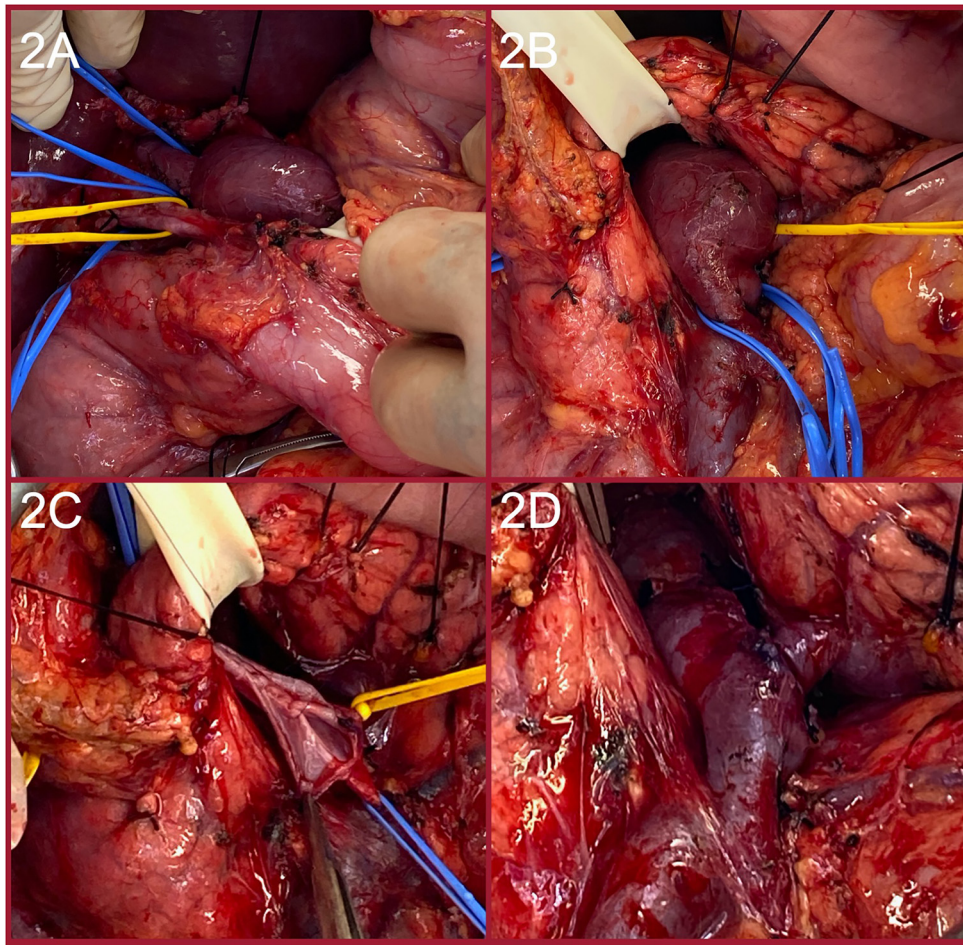


Fig. 2. Vascular control of the portal vein in the porta hepatis (A). Vascular control of the superior mesenteric and splenic veins at the caudal border of the pancreas (B). Aneurysmorrhaphy with running 4-0 polypropylene suture (C). The aneurysmorrhaphy was buttressed with the aneurysmal vein wall.

Disclosures

All authors have reviewed the manuscript in its final form and approve the manuscript for submission to Surgery Open Science.

Author contribution

GMY was involved in the data collection, drafting of the manuscript, critical revision of the manuscript, and final approval of the work.

TKM was involved in the study conception, data collection, drafting of the manuscript, critical revision of the manuscript, and final approval of the work.

AN and RSM were involved in the study conception, drafting of the manuscript, critical revision of the manuscript, and final approval of the work.

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Ethical approval

This study was granted exempt status by the Indiana University School of Medicine Institutional Review Board.

Declaration of competing interest

The authors declare no conflict of interest.

References

- [1] Barzilai R, Kleckner Jr MS. Hemocholecyst following ruptured aneurysm of portal vein: report of a case. *AMA Arch Surg*. 1956;72(4):725–7.
- [2] Laurenzi A, Ettorre GM, Lionetti R, et al. Portal vein aneurysm: what to know. *Dig Liver Dis*. Nov 2015;47(11):918–23. [PubMed PMID: 26188840. Epub 2015/07/21].
- [3] Thomas TV. Aneurysm of the portal vein: report of two cases, one resulting in thrombosis and spontaneous rupture. *Surgery*. Apr 1967;61(4):550–56067019.. [Epub 1967/04/01. eng].
- [4] Villani R, Lupo P, Angeletti AG, et al. Asymptomatic saccular portal vein aneurysm: a case report and review of the literature. *J Ultrasound*. Feb 3, 2022. [PubMed PMID: 35113392. Epub 2022/02/04].