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· 专题研究 ·

## 肠系膜动脉瘤破裂出血的诊治分析：附8例报告

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### 摘要

**背景与目的:** 肠系膜动脉瘤是一种罕见的疾病, 大部分患者确诊时动脉瘤已出现破裂大出血, 病情危重, 治疗风险大。本文回顾性分析肠系膜动脉瘤破裂患者的病例特点, 探讨该疾病诊断和治疗方式的选择。

**方法:** 回顾性分析于2016年1月—2020年12月在湖南省郴州市第一人民医院血管外科收治的8例肠系膜动脉瘤破裂出血患者的临床资料和随访情况。

**结果:** 8例患者行腹部CTA或腹部增强CT明确诊断为肠系膜动脉瘤破裂出血。患者均行急诊手术治疗, 其中6例行腹腔动脉造影+栓塞术; 1例因腔内治疗失败后选择行开放手术; 1例首选开放手术。8例患者均抢救成功, 3例患者腔内治疗术后出现腹痛腹胀, 药物保守治疗好转; 1例患者开放手术术后出现创伤性胰腺炎, 予以药物治疗治愈。所有患者住院期间均无再出血、肠缺血、肠坏死等并发症与再次手术。8例患者均随访12个月, 患者正常饮食后无腹痛腹胀不适, 无再次出血; 复查腹部增强CT或CTA提示动脉瘤栓塞良好, 血肿明显吸收。

**结论:** 临床医生要提高对肠系膜动脉瘤破裂出血疾病的认识和警惕, 及时做出正确诊断。手术治疗方案可分为开放手术和腔内治疗, 均安全和有效, 术前应根据患者病情、瘤体位置和形态决定具体手术方案。

### 关键词

动脉瘤, 破裂/诊断; 动脉瘤, 破裂/治疗; 肠系膜动脉  
中图分类号: R654.3

## Diagnosis and treatment of ruptured mesenteric artery aneurysm: a report of 8 cases

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### Abstract

**Background and Aims:** Mesenteric artery aneurysm is a rare type of visceral aneurysm, and most patients are diagnosed due to rupture and hemorrhage of the aneurysm, which is a critical condition with high treatment-related risk. Therefore, this study was conducted to investigate the diagnosis and treatment strategy of this disease through a retrospective analysis of the clinical characteristics of patients with ruptured mesenteric artery aneurysm.

**Methods:** The clinical data and follow-up results of 8 patients with ruptured mesenteric artery aneurysm

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treated in the Department of Vascular Surgery of Chenzhou First People's Hospital during January 2016 to December 2020 were retrospectively analyzed.

**Results:** In all the 8 patients, definitive diagnosis of ruptured mesenteric artery aneurysm was made by abdominal CTA or enhanced CT scanning. All patients received emergency surgical treatment, of whom, 6 cases underwent coeliac arteriography and aneurysm embolization, 1 case underwent open surgery due to endovascular treatment failure, and 1 case underwent open surgery directly. All the 8 patients were successfully salvaged. Three patients developed abdominal bloating and pain after endovascular treatment, and was resolved after medical treatment, 1 case developed traumatic pancreatitis after open surgery, and was cured and discharged after medical treatment. There were no complications such as rebleeding, intestinal ischemia, and intestinal necrosis, or requirement for reoperation in all patients during hospital stay. All the 8 patients were followed-up for 12 months, abdominal pain or abdominal distension after regular diets as well as rebleeding occurred in none of them, and reexamination of abdominal CT showed the aneurysms were embolized completely, and the abdominal hematoma was obviously absorbed.

**Conclusion:** Clinicians should increase their understanding and awareness of ruptured mesenteric artery aneurysm, so as to and make a timely and correct diagnosis. Both open surgery and endovascular treatment are effective and safe in the treatment of ruptured mesenteric artery aneurysm. The selection of surgical procedures should be determined based on patient's condition as well as the shape and position of the aneurysm.

**Key words** Aneurysm, Ruptured/diag; Aneurysm, Ruptured/ther; Mesenteric Arteries

**CLC number:** R654.3

肠系膜动脉瘤约占所有内脏动脉瘤1%，是一种罕见但危险度很高的内脏动脉瘤<sup>[1]</sup>。发病与动脉粥样硬化、动脉炎、神经纤维瘤病、纤维肌性发育异常、感染等有关<sup>[2-5]</sup>。肠系膜动脉瘤根据位置可分为肠系膜上动脉主干动脉瘤、肠系膜上动脉分支动脉瘤以及肠系膜下动脉瘤<sup>[6]</sup>。肠系膜动脉瘤患者常无明显临床症状，很难被发现，大多数患者在动脉瘤破裂大出血后才被确诊。肠系膜动脉瘤破裂风险和破裂后死亡风险高<sup>[7-9]</sup>。因此，在临床工作中需尽早诊断出肠系膜动脉瘤破裂，尽早实施救治。治疗方法主要是开放手术和腔内治疗，两种治疗方案均有效，但需根据患者病情、动脉瘤位置、形态等因素制定出个体化治疗方案<sup>[10]</sup>。本文回顾性分析2016年1月—2020年12月在湖南省郴州市第一人民医院血管外科治疗的8例肠系膜动脉瘤破裂出血患者的临床资料和随访情况，探讨肠系膜动脉瘤破裂的诊断和治疗方案的选择。

## 1 资料与方法

### 1.1 临床资料

收集2016年1月—2020年12月在湖南省郴州市中心医院血管外科住院的8例肠系膜动脉瘤破裂患者临床资料。8例患者中，男7例，女1例；年龄 $(54.5 \pm 6.4)$ 岁；患者既往均无外伤史，无风湿结缔组织疾病病史，无长期发热等病史；2例患者长期吸烟，2例患者长期饮酒。发病时症状均以突发剧烈腹痛为主。2例合并肠系膜上动脉夹层，2例合并腹腔干动脉夹层，4例未合并腹腔动脉夹层，2例患者合并高血压，8例患者均合并有动脉粥样硬化。动脉瘤位置位于胰十二指肠下动脉3例，回结肠动脉分支1例，右结肠动脉分支1例，中结肠动脉分支2例，肠系膜下动脉分支1例（表1）。

### 1.2 影像学检查

所有患者行腹部CT平扫提示腹腔血肿，后进一步完善腹部增强CT或腹部CTA检查诊断考虑肠系膜动脉瘤破裂。部分患者CT资料见图1。

表1 8例患者的临床资料  
Table 1 Clinical Data of the 8 patients

例序	性别	年龄(岁)	腹腔动脉夹层	高血压	动脉瘤位置
1	男	61	无	无	胰十二指肠下动脉
2	男	49	腹腔干及肝总动脉夹层	无	胰十二指肠下动脉
3	男	50	肠系膜上动脉夹层	无	肠系膜下动脉
4	男	62	无	有	回结肠动脉
5	男	46	腹腔干动脉夹层	无	胰十二指肠下动脉
6	男	55	肠系膜上动脉夹层	有	中结肠动脉
7	男	51	无	无	中结肠动脉
8	女	62	无	无	右结肠动脉

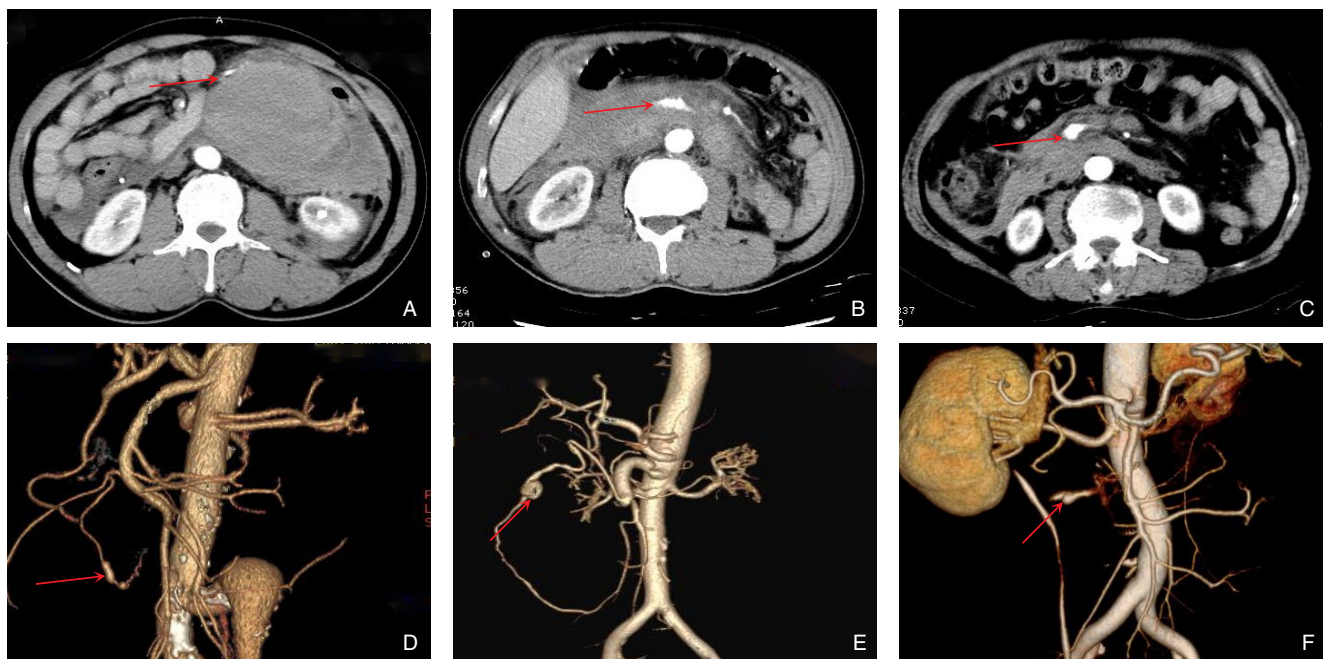


图1 部分患者CT资料(红色箭头表示肠系膜动脉瘤的位置) A-C: 腹部增强CT, 可见动脉瘤和腹腔大血肿; D-F: 腹部CTA, 可见肠系膜动脉瘤

Figure 1 CT data of some patients (the red arrows showing the locations of the mesenteric aneurysm) A-C: Enhanced CT scanning showing mesenteric aneurysm and large retroperitoneal hematoma; D-F: Abdominal CTA showing the mesenteric aneurysm

### 1.3 手术方法

**1.3.1 动脉瘤介入栓塞术** 患者取仰卧位, 常规消毒铺巾, 2%利多卡因行局麻, 穿刺股动脉成功后, 置入导管和超滑导丝, 分别行腹腔干、胃十二指肠动脉、肠系膜上动脉和肠系膜下动脉造影, 造影确认动脉瘤位置, 大小及同周围分支血管关系, 及供应肠管血流, 再置入微导管微导丝, 先配合进入动脉瘤远端, 术中根据需要置入不同规格、数量的弹簧圈栓塞, 然后退至瘤腔和动脉瘤近端进行栓塞。最后造影观察栓塞情况及附近肠管血供有无受影响。部分患者手术情况见图2。

**1.3.2 动脉瘤切除术** 气管内插管全身麻醉成功

后, 患者取仰卧位, 术野皮肤络合碘消毒铺无菌巾、单。取腹部正中切口, 逐层进腹, 游离肠管, 根据血肿位置进行探查, 显露出动脉瘤破口位置、载瘤动脉, 并完整切除动脉瘤和结扎载瘤动脉近端和远端, 再观察有无再出血、肠管有无坏死等情况, 后放置引流管, 缝合切口, 结束手术。

### 1.4 术后随访

术后1、6、12个月对患者进行复查腹部增强CT或CTA检查随访, 并询问患者有无腹痛腹胀、恶心呕吐、发热、肛门排气排便, 大便颜色和形状。



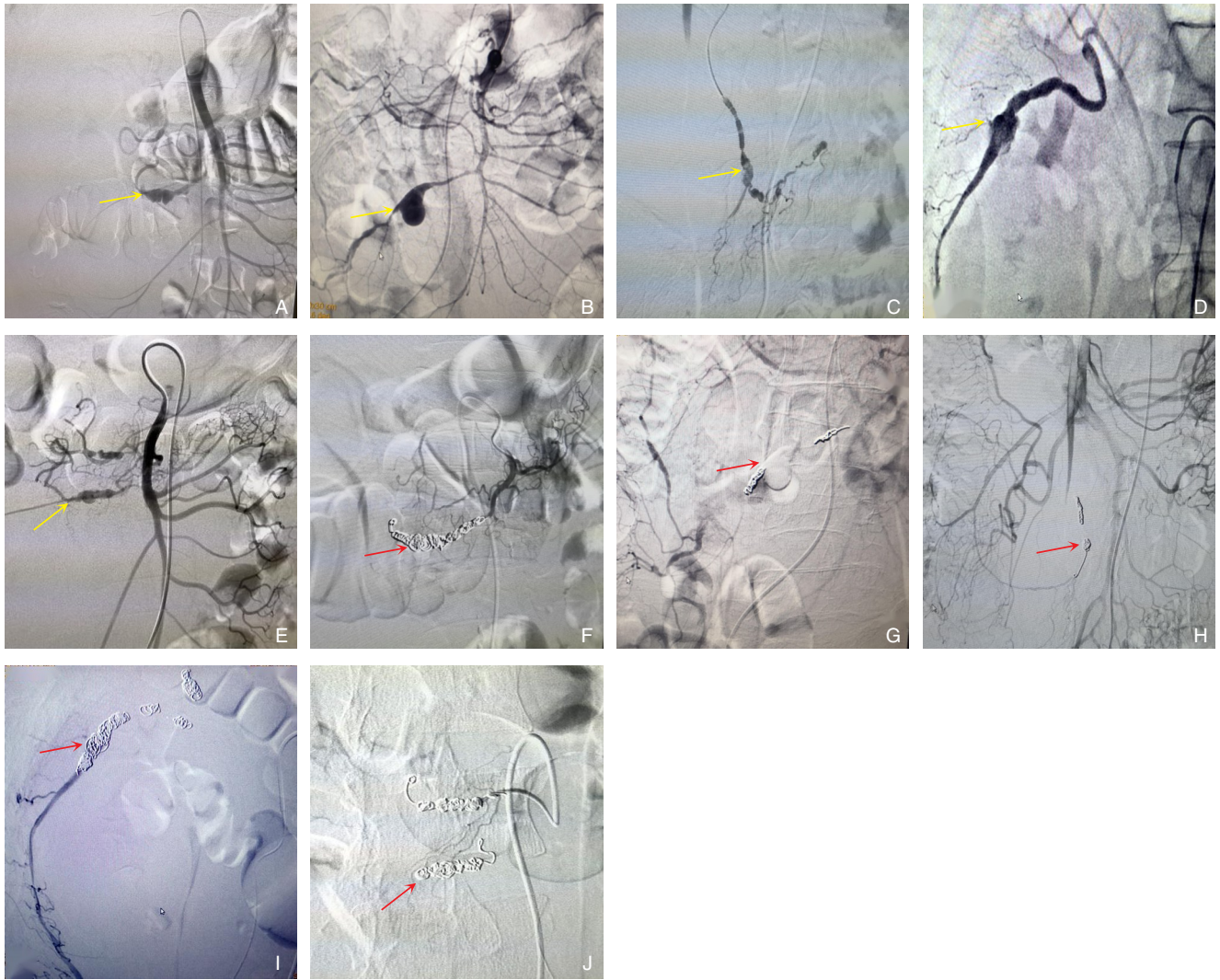


图2 部分患者术中资料 A-E: 腹腔动脉造影见肠系膜动脉瘤显影, 黄色箭头显示动脉瘤位置; F-J: 使用弹簧圈栓塞动脉瘤和瘤体近端和远端动脉后动脉瘤未显影, 红色箭头表示动脉瘤成功被栓塞

**Figure 2 Intraoperative views in some patients** A-E: Celiac arteriography showing the mesenteric aneurysm, and the yellow arrow indicating the position of the aneurysm; F-J: No contrast filling in the aneurysm after embolization of the inflow and outflow arteries of the aneurysm with spring coil, and the red arrow indicating the successful embolization of the aneurysm

## 2 结果

### 2.1 手术结果

8例患者中6例行腹腔动脉造影+动脉瘤栓塞; 1例因无法超选进入载瘤血管, 后行开放手术行动脉瘤切除止血; 1例因腹腔大出血后心脏骤停, 心肺复苏成功后, 术前腹部增强CT考虑肠系膜动脉瘤可疑, 后直接选择行开腹探查止血。8例患者均抢救成功, 1例患者开放术中损伤胰腺, 术后出现创伤性胰腺炎, 予以保守治疗治愈; 3例患者术后

出现腹痛腹胀较术前有加剧, 药物治疗好转。8例患者均无出现再出血、肠缺血、肠坏死等情况。

### 2.2 随访结果

8例患者均接受随访, 随访时间12个月, 所有患者均恢复正常饮食, 均无腹痛、腹胀、恶心及呕吐等不适, 肛门正常排气排便, 复查腹部增强CT或腹主动脉CTA均提示动脉瘤栓塞良好, 血肿吸收明显, 均无再次出血, 未再次手术。部分患者术后复查CTA见图3。



图3 部分患者术后复查腹主动脉CTA资料(未见动脉瘤显影,动脉瘤栓塞良好)

Figure 3 Abdominal CTA data of some patients after operation (no contrast filling of the aneurysm and complete embolization of the aneurysm)

### 3 讨论

肠系膜动脉瘤是临床上极罕见内脏动脉瘤,大多数患者首发症状主要是瘤体破裂时产生进行性腹痛加剧、消化道出血和休克等<sup>[11]</sup>。一旦肠系膜动脉瘤破裂,病情凶险,救治难度和风险极高。尽早诊断、尽早救治对该类患者的临床治疗及预后有着重要意义。但动脉瘤破裂发病时症状,在临床上很容易跟其他急腹症混淆,如胰腺炎、肿瘤出血等<sup>[12-13]</sup>。本文中一共有8例患者,其中3例患者首诊考虑为胰腺炎,2例诊断腹腔出血,原因不清,后经多学科会诊才考虑为肠系膜动脉瘤。以目前影像设备及技术条件,其实诊断肠系膜动脉瘤并不困难,需要的是提高对肠系膜动脉瘤的认识和警惕性。尤其是接诊患者突发腹痛伴有休克,且无外伤史时,行腹部CT平扫发现腹腔血肿的时候,首先要考虑腹腔动脉瘤破裂可能。大部分患者可通过进一步完善腹部增强CT或CTA检查明确诊断。术前行CTA检查不仅可以明确有无动脉瘤,还可以了解动脉瘤的大小及与周围血管、组织器官的解剖关系,为手术治疗方案提供一定的依据<sup>[14-16]</sup>。

肠系膜动脉瘤手术治疗方案有开放手术和腔内治疗。腔内治疗具有创伤小,手术风险小及术后并发症低等优势,已成为首要选择<sup>[17-19]</sup>。腔内治疗方法包括动脉瘤栓塞和置入覆膜支架隔绝动脉瘤<sup>[20-21]</sup>。对于动脉瘤位于肠系膜动脉末端或次要分支的动脉瘤,可采取栓塞的方式,因为肠系膜上动脉所发出的一级和二级分支间存在丰富的吻合支和血管祥,并且肠系膜上动脉与腹腔干、肠系

膜下动脉间存在丰富的交通支血管,栓塞动脉瘤各供养血管后,充足的侧支循环网常能保证相应肠段的终末供血<sup>[22]</sup>。本组6例患者因动脉瘤位置位于肠系膜动脉次级分支,都采用弹簧圈栓塞瘤体远端动脉、瘤体及瘤体近端载瘤动脉。在行栓塞供应瘤体动脉血流之前,首要造影要确认该瘤体动脉供应肠道区域,再造影周围侧支血管确定有其他血管网供应该肠管区域,防止栓塞后引起肠缺血肠坏死。术后3例患者腹痛腹胀有加重,因术中造影确认有其他侧支血管供应该区域肠管,故给予禁食、补液等药物保守治疗,患者症状均缓解出院,术后随访12个月患者正常饮食后无腹痛、腹胀等肠缺血表现。若动脉瘤体累及肠系膜上主干动脉,累及范围多位于距离肠系膜上动脉主干开口处约2~5 cm,为保证肠道血液供应,往往需置入覆膜支架<sup>[23]</sup>。腔内治疗近期效果满意,但远期仍有动脉瘤复发、再通或破裂的可能,发生的概率介于3%~17%<sup>[24-26]</sup>。若动脉瘤行覆膜支架置入术,术后容易出现覆膜支架内漏、支架内血栓形成和支架闭塞等情况<sup>[15,27]</sup>。行腔内治疗患者需长时间影像学检查定期随访。

开放手术方式有手术动脉瘤切除、结扎、血管重建,其疗效确切。开放手术风险及损伤较大,主要是因为破裂性动脉瘤引起腹腔大血肿,造成瘤体与周围组织界限不清,损伤周围组织风险较高。本组8例患者中有2例行开放手术,其中就有1例因动脉瘤位于胰腺背面,术中出血较多,且粘连较重,行动脉瘤切除时,损伤胰腺组织,导致胰痿,通过药物保守治疗后自愈。另外1例患者行



开放手术,虽然术后无严重并发症出现,但术后住院时间和住院费用明显高于腔内治疗手术患者。选择开放手术主要依据动脉瘤体解剖特点和患者病情,通常有以下4种情况首选开放手术:(1)动脉瘤体累及主干动脉。虽然不少研究者建议行覆膜支架置入术,该方案近期效果尚可,但远期效果较差,且一旦出现并发症往往难以处理。目前覆膜支架的顺应性差,在动脉瘤过大或血管过于迂曲时无法有效释放,同时存在支架覆盖锚定区的分支血管导致节段性肠坏死的风险,远期支架容易闭塞等系列问题。因此若动脉瘤位于主干或累及主要分支血管,首先开放手术,若患者高龄,病情危重,估计难以耐受开放手术和全麻风险,可尝试首选置入覆膜支架;(2)动脉瘤瘤颈较大、血液湍流较强,栓塞难以将动脉瘤塞满,并且弹簧圈等栓塞物有向远端脱落的风险,存在肠缺血坏死高风险;(3)行腔内治疗失败,本组1例患者首选是腔内治疗,术中行腹腔造影可见动脉瘤显影,但因受巨大血肿压迫和推压,造成载瘤血管细小和扭曲明显,反复超选始终未能进入瘤体血管,后选择开放手术;(4)对于动脉瘤破裂大出血伴有循环不稳定患者,需紧急手术控制出血,术前CT提示血肿对动脉瘤血管有推压,腔内治疗有失败可能,建议果断行开放手术。本组1例患者到达我院时动脉瘤破裂急性大出血,出现心脏呼吸骤停,心肺复苏成功后,患者循环呼吸不稳定。考虑患者腹腔血肿压迫和挤压载瘤血管,担心腔内治疗失败,且我院无杂交手术室,多次搬动耗费时间长,遂果断决定行开放手术,效果良好。综上,开放手术虽然创伤和手术风险大,但疗效确切和止血彻底,手术方式多样,根据患者不同病情,瘤体形态和位置等,选择结扎、重建,且术中若发现肠缺血肠坏死,可行肠切除术<sup>[28]</sup>。因此开放手术到目前仍是腔内治疗的重要补充和有力保障。

综上,临床医生需要重视和提高对肠系膜动脉瘤的认识,及时做出判断。特别是临床表现为腹痛伴有消化道出血、非外伤性腹腔内或腹膜后出血的患者,应首先排除肠系膜动脉瘤破裂出血的可能。开放手术和腔内手术对治疗肠系膜动脉瘤破裂均可有效止血<sup>[29]</sup>。腔内治疗目前可作为绝大部分患者的首选治疗,但开放手术是腔内治疗

重要的补充手段。具体手术治疗方案需根据患者病情、瘤体位置和形态等多因素共同决定。

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#### 参考文献

- [1] Takematsu T, Kosumi K, Tajiri T, et al. Surgical resection of a ruptured transverse pancreatic artery aneurysm[J]. *Surg Case Rep*, 2021, 7(1):53. doi: 10.1186/s40792-021-01128-4.
- [2] Sousa J, Costa D, Mansilha A. Visceral artery aneurysms: review on indications and current treatment strategies[J]. *Int Angiol*, 2019, 38(5):381-394. doi: 10.23736/S0392-9590.19.04194-4.
- [3] Silvestri V, Sapienza P, Ossola P, et al. Ruptured Superior Mesenteric Artery Aneurysm due to Fibromuscular Dysplasia: A Rare Vascular Presentation in a Patient with Schizophrenia[J]. *Ann Vasc Surg*, 2019, 58: 384. e5-384. e8. doi: 10.1016/j.avsg.2018.11.030.
- [4] Obara H, Kentaro M, Inoue M, et al. Current management strategies for visceral artery aneurysms: an overview[J]. *Surg Today*, 2020, 50(1):38-49. doi: 10.1007/s00595-019-01898-3.
- [5] Fukushima N, Aoki H, Takenaga S, et al. Ruptured visceral artery aneurysms in a patient of neurofibromatosis type 1 (NF-1) successfully treated by endovascular treatment[J]. *Surg Case Rep*, 2020, 6(1):18. doi: 10.1186/s40792-020-0791-6.
- [6] 黄新天. 内脏动脉瘤常见病因及诊治[J]. *中国实用外科杂志*, 2009, 29(11):894-896. doi:10.3321/j.issn:1005-2208.2009.11.006. Huang XT. Etiology and surgical treatment of splanchnic artery aneurysms[J]. *Chinese Journal of Practical Surgery*, 2009, 29(11): 894-896. doi:10.3321/j.issn:1005-2208.2009.11.006.
- [7] Juntermanns B, Bernheim J, Karaindros K, et al. Visceral artery aneurysms[J]. *Gefasschirurgie*, 2018, 23(Suppl 1): 19-22. doi: 10.1007/s00772-018-0384-x.
- [8] Jiang J, Ding X, Su Q, et al. Therapeutic management of superior mesenteric artery aneurysms[J]. *J Vasc Surg*, 2011, 53(6): 1619-1624. doi: 10.1016/j.jvs.2011.02.004.
- [9] Jacobs CR, Fatima J, Scali ST, et al. Surgical Treatment of True Superior Mesenteric Artery Aneurysms[J]. *Ann Vasc Surg*, 2021, 71:74-83. doi: 10.1016/j.avsg.2020.08.142.
- [10] Wang L, Shu C, Li Q, et al. Experience of managing superior mesenteric artery aneurysm and its midterm follow-up results with 18 cases[J]. *Vascular*, 2021, 29(4): 516-526. doi: 10.1177/1708538120962884.
- [11] Sachdev-Ost U. Visceral artery aneurysms: review of current management options[J]. *Mt Sinai J Med*, 2010, 77(3):296-303. doi: 10.1002/msj.20181.

- [12] 毕国善, 戴先鹏, 申昕, 等. 胰十二指肠动脉瘤合并腹腔干动脉狭窄的介入治疗: 附6例报告[J]. 中国普通外科杂志, 2018, 27(12): 1551-1555. doi:10.7659/j.issn.1005-6947.2018.12.009.
- Bi GS, Dai XP, Shen X, et al. Interventional therapy for pancreaticoduodenal artery aneurysm with celiac axis stenosis: a report of 6 cases[J]. Chinese Journal of General Surgery, 2018, 27(12):1551-1555. doi:10.7659/j.issn.1005-6947.2018.12.009.
- [13] Murata A, Amaya K, Mochizuki K, et al. Superior Mesenteric Artery-Pancreaticoduodenal Arcade Bypass Grafting for Repair of Inferior Pancreaticoduodenal Artery Aneurysm with Celiac Axis Occlusion[J]. Ann Vasc Dis, 2018, 11(1): 153-157. doi: 10.3400/avd.cr.17-00113.
- [14] Horton KM, Smith C, Fishman EK. MDCT and 3D CT angiography of splanchnic artery aneurysms[J]. AJR Am J Roentgenol, 2007, 189(3):641-647. doi: 10.2214/AJR.07.2210.
- [15] Zilun L, Henghui Y, Yang Z, et al. The Management of Superior Mesenteric Artery Aneurysm: Experience with 16 Cases in a Single Center[J]. Ann Vasc Surg, 2017, 42: 120-127. doi: 10.1016/j.avsg.2016.11.014.
- [16] Ghodasara N, Liddell R, Fishman EK, et al. High-Value Multidetector CT Angiography of the Superior Mesenteric Artery: What Emergency Medicine Physicians and Interventional Radiologists Need to Know[J]. Radiographics, 2019, 39(2): 559-577. doi: 10.1148/rg.2019180131.
- [17] Hosn MA, Xu J, Sharafuddin M, et al. Visceral Artery Aneurysms: Decision Making and Treatment Options in the New Era of Minimally Invasive and Endovascular Surgery[J]. Int J Angiol, 2019, 28(1):11-16. doi: 10.1055/s-0038-1676958.
- [18] Aschenbach R, Diamantis I, Bürckenmeyer F, et al. Endovascular Therapy of Splanchnic Artery Aneurysms: For Each and Every Aneurysm?[J]. Zentralbl Chir, 2019, 144(5):451-459. doi: 10.1055/a-0770-4715.
- [19] Chaer RA, Abularrage CJ, Coleman DM, et al. The Society for Vascular Surgery clinical practice guidelines on the management of visceral aneurysms[J]. J Vasc Surg, 2020, 72(1S): 3S-39S. doi: 10.1016/j.jvs.2020.01.039.
- [20] Higashiura W, Takara H, Kitamura R, et al. Endovascular Therapy for Distal Superior Mesenteric Artery Mycotic Aneurysms due to Infective Endocarditis[J]. J Endovasc Ther, 2019, 26(6): 879-884. doi: 10.1177/1526602819865985.
- [21] Kim SH, Lee MS, Han HY, et al. Endovascular Management of Ruptured Middle Colic Artery Aneurysm and Review of the Literature[J]. Ann Vasc Surg, 2019, 59: 310. e13-310. e16. doi: 10.1016/j.avsg.2018.12.099.
- [22] Armstrong PJ, Franklin DP. Superior mesenteric artery branch aneurysm with absence of the celiac trunk[J]. Vascular, 2006, 14(2): 109-112. doi: 10.2310/6670.2006.00015.
- [23] Yamashita T, Yamanaka K, Izumi A, et al. Endovascular repair using a covered stent for a ruptured infected aneurysm of the superior mesenteric artery after pancreaticoduodenectomy: a case report[J]. Surg Case Rep, 2020, 6(1): 270. doi: 10.1186/s40792-020-01047-w.
- [24] Spiliopoulos S, Sabharwal T, Karnabatidis D, et al. Endovascular treatment of visceral aneurysms and pseudoaneurysms: long-term outcomes from a multicenter European study[J]. Cardiovasc Intervent Radiol, 2012, 35(6): 1315-1325. doi: 10.1007/s00270-011-0312-x.
- [25] Ferrero E, Ferri M, Viazzo A, et al. Visceral artery aneurysms, an experience on 32 cases in a single center: treatment from surgery to multilayer stent[J]. Ann Vasc Surg, 2011, 25(7): 923-935. doi: 10.1016/j.avsg.2011.04.006.
- [26] Ghariani MZ, Georg Y, Ramirez C, et al. Long-term results of surgical treatment of aneurysms of digestive arteries[J]. Ann Vasc Surg, 2013, 27(7):954-958. doi: 10.1016/j.avsg.2013.02.007.
- [27] Balderi A, Antonietti A, Pedrazzini F, et al. Treatment of visceral aneurysm using multilayer stent: two-year follow-up results in five consecutive patients[J]. Cardiovasc Intervent Radiol, 2013, 36(5): 1256-1261. doi: 10.1007/s00270-013-0705-0.
- [28] Van Petersen A, Meerwaldt R, Geelkerken R, et al. Surgical options for the management of visceral artery aneurysms[J]. J Cardiovasc Surg (Torino), 2011, 52(3):333-343.
- [29] Barrionuevo P, Malas MB, Nejm B, et al. A systematic review and meta-analysis of the management of visceral artery aneurysms[J]. J Vasc Surg, 2019, 70(5):1694-1699. doi: 10.1016/j.jvs.2019.02.024.

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