

Viszeral Arterielle Aneurysmen

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Welche Arterien sind betroffen:

- Truncus coeliacus
 - A. lienalis
 - A. hepatica communis
 - A. gastrica sinister
- A. mesenterica superior et inferior
- A. renalis

History

- 1809: first reported hepatic artery aneurysm as a post-mortem finding after ruptur(1)
- 1903: first successful operative repair by ligating(2)
- 1951, first successful VAA treatment by ligation and revascularization (3)

Table 2. Symptoms of visceral artery aneurysm

Presenting symptoms	No of patients	%
Asymptomatic	5	12
Symptomatic	36	88
Gastrointestinal bleeding	21	51.2
Abdominal pain	17	41.4
Shock	11	26.8
Rupture into peritoneum	5	12.2
Fever	5	12.2
Hemobilia	3	7.3
Jaundice	2	4.9

(11)

Wie gefährlich ist VAA?

- High incidence of rupture and hemorrhage (6)
 - distribution of aneurysms among the visceral vessels : splenic artery (60%), hepatic artery (20%), superior mesenteric artery (5.5%), celiac artery (4%), gastric and gastroepiploic arteries (4%), jejunal, ileal, colic (3%), pancreaticoduodenal and pancreatic arteries (2%), gastroduodenal artery (1.5%), and inferior mesenteric artery (<1%) (7)
- The real incidence is unknown because most cases are asymptomatic (10) 1-2% of all vascular aneurysms (9) Visceral artery aneurysms are rare, with an incidence of just 0.01% to 0.2%
 - Renal and splanchnic artery aneurysms 0.01%–0.09% and 0.1%–2% (4)

- 22% of reported visceral artery aneurysms are with rupture, resulting in 8.5% mortality rate (7,5)
- Mortality 21 % for hepatic artery aneurysms to 100% for celiac artery ones. (10)
 - hepatic artery aneurysms with a high rupture risk of 80% (6)
 - patients with hepatic aneurysms have also multiple aneurysms visceral (31%) and non-visceral circulation (42%)(6)
 - splenic artery aneurysm rupture risk of 20% (6)
- mortality rate : 20% to 70% with the rupture of a VAA depending on the location and size (12)
- Ätiologie: Atherosclerosis (32% of cases), Medial degeneration/dysplasia (24%), Abdominal trauma (22%), Infection and inflammatory disease (10%), Connective tissue disorders (Marfan syndrome, Ehlers-Danlos syndrome, Osler-Weber-Rendu disease, fibromuscular dysplasia, Kawasaki, hereditary hemorrhagic telangiectasia, And hyperflow conditions (portal hypertension, pregnancy)

indications for intervention: diameter => 1.5-2 cm, rapid growth of the aneurysm, symptomatic aneurysm, and the childbearing age (8)

Table 1 Visceral artery aneurysm by location

Location	Incidence/ Prevalance (%)	Risk of rupture (%)	Mortality after rupture (%)	M:F ratio	Indications for surgery
Splenic artery	50-75/ <0.1	2-10	20-30	1:3-4	≥2 cm, female childbearing age, OLTx, symptomatic
Hepatic artery	20	14-80	21-43	3:2	≥2 cm, multiple, non-atherosclerotic, symptomatic
Pancreaticoduodenal arcade	2-6	75	50	4:1	≥2 cm, symptomatic
Renal artery	15-22/ 0.01-0.09	2.8-5.6	6-10, 80 in pregnancy	1:1.5-2	≥1.5 cm, renovascular HTN, female childbearing age, symptomatic

(6)

Diagnosis

- Computed tomography
- Magnetic resonance
- Ultrasonography
- Arteriography

Einteilung nach Symptomatik

- Asymptomatisch
- Symptomatisch
- Ruptur

Table 2 Proposed guidelines for surgical management

VAPA require treatment

Symptomatic and ruptured VAA require treatment

Splanchnic artery aneurysm with vessel diameter ≥ 2 cm

Renal artery aneurysm with vessel diameter ≥ 1.5 cm

VAA with rapid growth rate: ≥ 0.5 cm/year

VAA in women of childbearing age or pregnant

VAA in orthotopic liver transplant recipients

VAA: visceral artery aneurysms; VAPA: visceral artery aneurysms and pseudoaneurysms

(6)

Table 3 Surgical management

Traditional open technique
Excision of the aneurysm
Revascularization
End organ resection (i.e. splenectomy, nephrectomy)
Ligation of aneurysm
Minimally invasive
Laparoscopic clipping
Robotic assisted interventions
Endovascular technique
Coil embolization
Covered stent placement
Plug deployment
Gluing
Endoluminal thrombin injection
Polyvinyl alcohol injection
Particle injection
Gelfoam injection

(6)

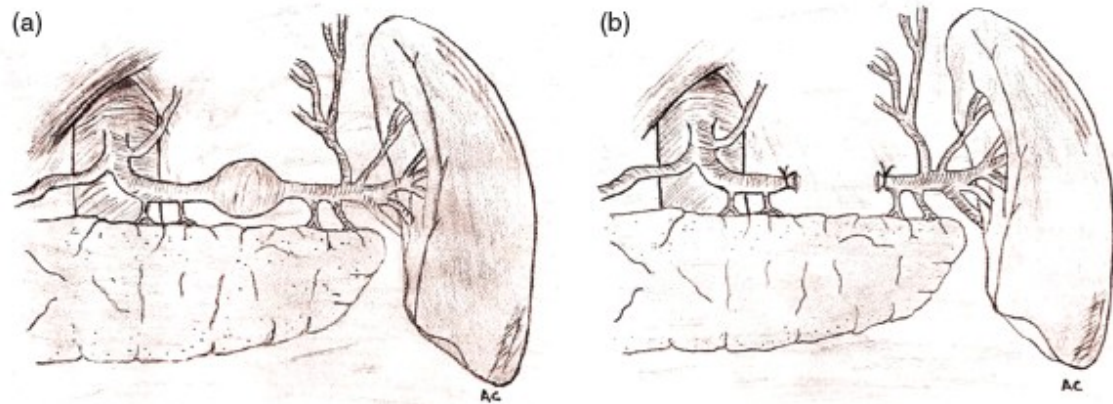


Fig. 1 Traditional open surgical management. (a) Splenic artery aneurysm, (b) Ligation and exclusion of splenic artery aneurysm.

(6)

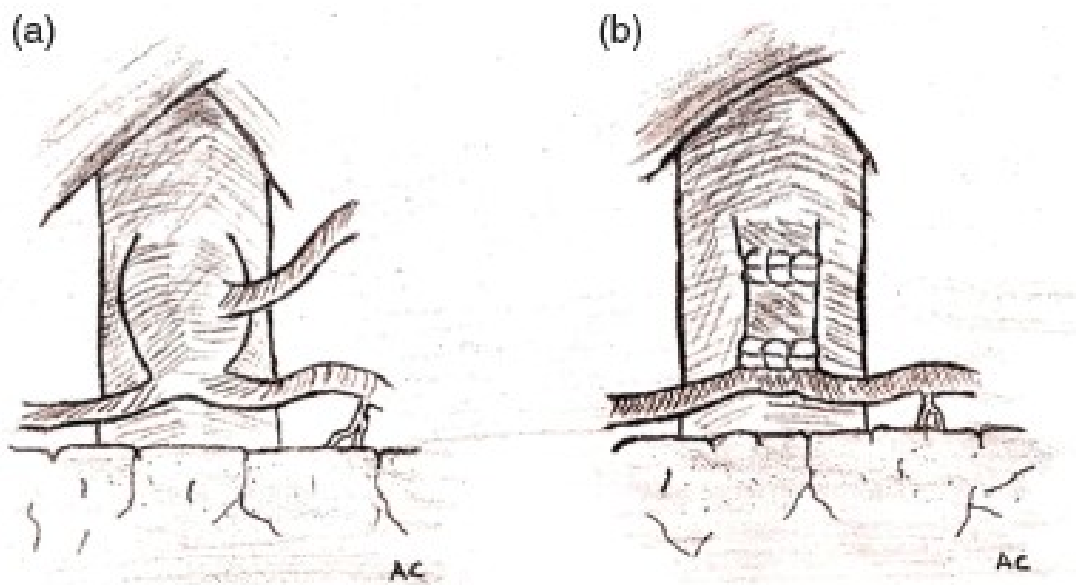


Fig. 2 (a) Celiac artery aneurysm, (b) Resection and revascularization of celiac artery aneurysm.

(6)



Fig. 3 Endovascular management. (a) Coil embolization of arterial inflow and outflow, (b) Coil embolization of aneurysm, (c) Stent graft exclusion of aneurysm.

(6)

Marone EM, Mascia D, Kahlberg A, et al. Is open repair still the gold standard in visceral artery aneurysm management? Ann Vasc Surg 2011; 25: 936-46.

- 94 patients with VAA/VAPA between 1988 and 2010, 74 patients managed with open traditional surgical technique, 20 with an endoluminal technique
- 100 % success with the open approach, 1 mortality (1,3%), and morbidity of 9.4%
- endovascular group had no perioperative mortality but a 10% perioperative morbidity
- Conclusion: endovascular treatment is safe and feasible in selected patients, but incomplete exclusion may be observed, requiring late surgical conversion in a significant number of patients. Long-term results (high survival, low complication rate) confirm the durability of the surgical approach that in our experience remains the gold standard with satisfactory results, especially for aneurysms involving the visceral hilum.

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