Management of Visceral Aneurysms: a 20-years Single Centre Experience

Gianfranco Filippone, MD*

Francesco Talarico, MD**

Division of Cardiac Surgery-*  University of Palermo, Italy

Division of Vascular and EndoVascular Surgery**  Ospedale Civico Palermo, Italy
Disclosure of Interest

Speaker name: Gianfranco Filippone

- I do not have any potential conflict of interest
Introduction

• Aneurysmal degeneration of the visceral branches of the abdominal aorta is a rare but potential life-threatening disease entity.
• Prevalence of VAA has a documented range from 0.1% up to 2%.
• Natural history is insidious and the risk for aneurysm rupture and death remains real also for small asymptomatic VAA.
• Mortality rate is reported 21% for ruptured hepatic VAA up to 100% for ruptured celiac VAA.
Management

• Conservative
• Open Repair
• Endovascular Repair
Methods

• 1/1995 to 8/2015

• 28 patients VAA
  21 Male    7 Female
  mean age: 56 yrs (range 25-87)
Asymptomatic n= 18  (64,2%)
Symptomatic n=  7  (25%)
Ruptured      n=  3  (10,7%)
60% VAA are renal and splenic

25% of VAA are located at hepatic artery and celiac trunk
## Intraoperative Data

<table>
<thead>
<tr>
<th>SITE</th>
<th>N°OF LESIONS</th>
<th>TYPE OF INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celiac Trunk</td>
<td>1</td>
<td>Resection and venous graft</td>
</tr>
<tr>
<td>Celiac Trunk</td>
<td>1</td>
<td>Resection and patch closure</td>
</tr>
<tr>
<td>Celiac Trunk</td>
<td>1</td>
<td>Resection and tube graft</td>
</tr>
<tr>
<td>Hepatic Artery *</td>
<td>1</td>
<td>Percutaneous intervention</td>
</tr>
<tr>
<td>Hepatic Artery</td>
<td>1</td>
<td>Percutaneous intervention</td>
</tr>
<tr>
<td>Hepatic Artery</td>
<td>1</td>
<td>Aneurysmectomy and arterial ligation</td>
</tr>
<tr>
<td>Hepatic Artery</td>
<td>1</td>
<td>Resection with end to end anastomosis</td>
</tr>
<tr>
<td>Renal Artery</td>
<td>3</td>
<td>Percutaneous intervention</td>
</tr>
<tr>
<td>Renal Artery</td>
<td>3</td>
<td>Resection and tube graft</td>
</tr>
<tr>
<td>Renal Artery *</td>
<td>2</td>
<td>Nephrectomy</td>
</tr>
<tr>
<td>Renal Artery</td>
<td>1</td>
<td>Nephrectomy</td>
</tr>
<tr>
<td>Renal Artery</td>
<td>1</td>
<td>Ex vivo repair</td>
</tr>
<tr>
<td>Splenic Artery</td>
<td>3</td>
<td>Percutaneous Intervention</td>
</tr>
<tr>
<td>Splenic Artery</td>
<td>3</td>
<td>Splenectomy and ligature</td>
</tr>
<tr>
<td>Splenic Artery</td>
<td>1</td>
<td>Splenectomy and ligature in laparoscopy</td>
</tr>
<tr>
<td>Splenic Artery</td>
<td>1</td>
<td>Resection with end to end anastomosis</td>
</tr>
<tr>
<td>Inferior Mesen. Artery</td>
<td>2</td>
<td>Resection and tube graft</td>
</tr>
<tr>
<td>Gastroepiploic Artery</td>
<td>1</td>
<td>Resection with arterial ligature</td>
</tr>
</tbody>
</table>

* RUPTURED VAA
Intraoperative Data

INTRAOPERATIVE DATA

- Resect and venous graft - celiac Trunk
- Resect and tube graft - celiac Trunk
- Aneurysm and art ligat - hepatic art
- Percutan interv - renal art
- Nephrectomy - renal art
- Percut interv - splenic art
- Resect with end to end anast - splenic arte
- Resect with arter lig - gastroepipl art
- Resect and patch closure - celiac Trunk
- Percut interven - hepatic artery
- Resect with end to end - hepatic art
- Resect and tube graft - renal art
- Ex vivo repair - renal art
- Splenec and ligat - splenic art
- Resect and tube graft - inf mesent art

28.5% = Endovascular-repair 8/28 VAA
Ex vivo repair of a Renal artery aneurysm
Ex vivo repair of a Renal artery aneurysm
Ex vivo repair of a Renal artery aneurysm
Ex vivo repair of a Renal artery aneurysm

Pre-op

Post-op
Celiac Trunk Aneurysm Repair
Celiac Trunk Aneurysm Repair
Celiac Trunk Aneurysm Repair
Celiac Trunk Aneurysm Repair

Post-op control
Laparoscopic Splenic Artery Aneurysm repair
Laparoscopic Splenic Artery Aneurysm repair
EndoVascular coil embolization of Renal Artery Aneurysm
S/P AAA repair
EndoVascular coil embolization of Renal Artery Aneurysm
Results

• Overall mortality = 10.7%
• 2 pts (66%) with ruptured renal VAA die due to MOF
• 1 pt (4%) with splenic VAA die due to pancreatitis

Long-term results

1 pt S/P endo-repair for splenic VAA die 4 months later
Long-Term Outcomes of Conservative Management of Visceral Artery Aneurysms


Results: We identified 150 patients with VAA: 64 were conservatively managed and 86 underwent open or endovascular repair. Demographics, comorbidities, anatomy, and presentation are detailed in the Table. The mean follow-up for observed VAA was 37.5 ± 42.1 months, and 53 splenic and 11 renal aneurysms were followed up for a mean of 34.6 ± 40.3 months. Splenic aneurysms ranged in diameter from 7.7 to 45.9 mm, with 56.6% being at the hilum, and 81.1% were heavily calcified specifically in the observed group. Most patients were women beyond the childbearing age. Renal aneurysms ranged in diameter from 6.3 to 30.2 mm and were primarily localized to the proximal renal artery (54.5%). Most patients were older females. During the follow-up period, the mean diameter of splenic and renal aneurysms remained unchanged. No patients in the observed group required an intervention for elective or urgent repair. No aneurysm-related mortality was identified in the observed group for both renal and splenic aneurysms.

Conclusions: Splenic and Renal Aneurysms can be conservatively managed even at a diameter >15 mm, especially in older patients and post-menopausal women. The growth rate in patients aged >65 years is very slow, and rupture or need for elective repair are rare over long-term follow-up.

(JOURNAL OF VASCULAR SURGERY September 2014)
Open repair, Endovascular repair, and Conservative management of true splenic artery aneurysms

Wouter Hogendoorn, MD,a,b Anthi Lavida, MBBS,a,c M. G. Myriam Hunink, MD, PhD,d,e,f Frans L. Moll, MD, PhD,b George Geroulakos, MD, PhD,c Bart E. Muhs, MD, PhD,a and Bauer E. Sumpio, MD, PhD,a New Haven, Conn; Utrecht and Rotterdam, The Netherlands; London, United Kingdom; and Boston, Mass

Conclusions: EV of SAA has better short-term results compared with OPEN, including significantly lower perioperative mortality. OPEN is associated with fewer late complications and fewer reinterventions during follow-up. Patients treated with CONS showed a higher late mortality rate. Ruptured SAAs are predictors of a significantly higher perioperative mortality compared with nonruptured SAAs in the OPEN and EV groups.
Is Open Repair Still the Gold Standard in Visceral Artery Aneurysm Management?

Enrico Maria Marone, Daniele Mascia, Andrea Kahlberg, Chiara Brioschi, Yamume Tshomba, Roberto Chiesa

Conclusion:

ET 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

Contemporary Outcomes of Intact and Ruptured Visceral Artery Aneurysms

Ankur J. Shukla, MD, Raymond Eid, MD, Larry Fish, PhD, Efthymios Avgerinos, MD, Luke Marone, MD, Michel Makaroun, MD, and Rabih A. Chaer, MD, MSc, Pittsburgh, Pa

The 30-day mortality rate was 0% for iVAAs, which was significantly lower than mortality for rVAAs (11.9%; P < .05)

(J Vasc Surg 2015;61:1442-8.)
Visceral artery aneurysms: Incidence, management, and outcome analysis in a tertiary care center over one decade.

Michael B. Pitton & Evelyn Dappa & Florian Jungmann & Roman Kloeckner & Sebastian Schotten & Gesine M. Wirth & Jens Mittler & Hauke Lang & Peter Mildenberger & Karl-Friedrich Kreitner & Katja Oberholzer & Christoph Dueber

Conclusions:
Pseudoaneurysms of visceral arteries have a high risk for rupture.
Aneurysm size seems to be no reliable predictor for rupture.
Interventional treatment is safe and effective for management of VAA.
Conclusions

- VAA are rare but under-diagnosed life-threatening disease;
- When rupture occurs is a catastrophic event;
- Size = 2 cm is not the only cut-off (etiology, symptomatology, female child-bearing age anatomy, i.e.);
- Excellent short and long-term results when repair is performed as elective;
- Lower mortality and/or morbidity when repair is performed as endovascular;
- ET probably the gold-standard when performed as urgent;
- Higher incidence of re-operation when repair is performed as endovascular;
- Integrated and not antithetic approach permit a tailor-made solution for each single patient.
THANK YOU FOR ATTENTION