Embolisation therapy for visceral aneurysms, bleeding, and beyond

Endovascular techniques for treatment of visceral aneurysms

Marcus Treitl, MD, EBIR
Institute for Clinical Radiology
University Hospitals of Munich
Disclosure

Speaker name:

Marcus Treitl

I have the following potential conflicts of interest to report:

✗ Consulting: Abbott, ab medica, Biotronik, BTG, Endoscout, Medtronic, Straub
Incidence, etiology and significance of visceral artery aneurysms

- Very rare: 0.01 – 0.2%
- Rupture in ≈ 25%
  - Mortality of rupture: 25 – 70%

<table>
<thead>
<tr>
<th>Artery</th>
<th>Incidence</th>
<th>Rupture rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Splenic artery</td>
<td>60%</td>
<td>20% (f:m = 4:1)</td>
</tr>
<tr>
<td>Hepatic artery</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>Superior mesenteric artery</td>
<td>5%</td>
<td>38%</td>
</tr>
<tr>
<td>Celiac trunk</td>
<td>4%</td>
<td>80%</td>
</tr>
<tr>
<td>Gastric / gastroepiploic arteries</td>
<td>3%</td>
<td>90%</td>
</tr>
<tr>
<td>Intestinal arteries</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Pancreatic duodenal arteries</td>
<td>1%</td>
<td>75%</td>
</tr>
<tr>
<td>Jejunal, ilial, and colonic arteries</td>
<td>3%</td>
<td>30%</td>
</tr>
<tr>
<td>Renal artery</td>
<td>25% of all visceral aneurysms</td>
<td>30%</td>
</tr>
</tbody>
</table>

Gehlen JMLG et al. Vascular and Endovascular Surgery 45(8) 681-687
Indications for treatment

• General indication:
  – Symptomatic patient OR
  – > 2cm in size
    • 1.5cm for renal artery aneurysms *
  – 3 times greater in diameter than native artery

• Additionally consider treatment in case of:
  – Pseudoaneurysms (hepatic artery)
  – Woman at childbearing age (especially for splenic artery!)
  – Endorgan complications, e.g. embolization
  – Calcified wall does NOT hamper rupture!

• No indication:
  – Asymtpomatic non-renal true aneurysm < 2cm without end-organ complications

* Bracale UM et al. Diagn Interv Radiol. 2017 Jan-Feb;23(1):77-80
Basic options for endovascular treatment

• True aneurysms:
  – Can be packed with coils, low risk of rupture

• Pseudoaneurysms:
  – Intra-aneurysmal activities should be avoided!
  – Risk of rupture
  – E.g. stent-grafting or distal/proximal coil occlusion

Keep in mind when using stent grafts:
- Require larger access sheaths
- All systems very stiff
  - Can be difficult in kinked access vessels
  - High stress on vessel wall
  - Risk of thrombosis anyway
- Use with caution in potentially infected sites
Strategies for complex situations

- Arterial remodelling – Balloon- or stent-assisted – If patency of native vessel essential – In case of complex access path
  - Think about neuro stents
  - Flow diverter stents – For complex aneurysms with relevant side branches
  - Extremely flexible / high shearing force:
    - Risk of secondary dislocation
    - Require pre-load with Clopidogrel and dual anti-platelet therapy
Female, 36 yrs
Incidental finding of splenic artery pseudoaneurysm

Indications:
- Pseudoaneurysm
- Women in childbearing age
- Size > 2cm

Probing of trunk with SIM1 7F sheath in trunk
V-18 wire in splenic artery
Viabahn 6 x 50mm
Female, 56 yrs
Renal artery aneurysm at origin of two pole arteries

Indications:
- Renal artery
- Size > 2cm

Flow diverter stent
Balt Silk 5,5 x 40
Male, 51 yrs
Incidental finding of 4cm hepatic artery aneurysm
Asymptomatic

Indications:
- Hepatic artery
- Pseudoaneurysm
- Size > 2cm
Male, 76 yrs
Incidental finding of 4.5 cm renal artery aneurysm
Asymptomatic

Indications:
- Renal artery
- Size > 2cm

Balt Leo Stent 5.5 x 75

Coil embolization with detachable coils (Concerto™)
Data for endovascular treatment of visceral artery aneurysms

• Kok HK et al. JVIR 2016: Review and own data
  – 22 studies, 646 aneurysms (432 true, 151 false)
    • 93.2% technical success, 99.3% visceral preservation
    • 3.5% major complications
    • 1.5% 30-day periprocedural mortality

• Guo B et al. J Vasc Surg 2016:
  – 113 aneurysms, 27 symptomatic
    • 96.3 / 97.5% technical success
    • 2.8% 30-day mortality
    • 3.8% aneurysm related mortality during 39mths FUP
    • 3.8% re-intervention rate
Summary and conclusion

• Visceral artery aneurysms are rare but can have high mortality
• Most dangerous: hepatic / trunk / gastric loc.
• Treatment:
  – > 2cm, symptomatic, pseudoaneurysms, end organ complications, woman in childbearing age
• Endovascular treatment is safe and feasible
  – > 90% technical success rates; 30-day mortality 1.5 – 2.8%
    • Higher for symptomatic aneurysms
Thank you very much for your attention!

- CORRESPONDING AUTHOR:
  Prof. Dr. med. Marcus Treitl, EBIR, MBA
  Hospitals of the Ludwig-Maximilians-University of Munich
  Institute for Clinical Radiology

- Fon: +49-89-44005-9240
- E-Mail: mtreitl@med.uni-muenchen.de
- Internet: www.klinikum.uni-muenchen.de
  www.radiologie-lmu.de
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