Rescue procedures in acute visceral ischemia

Yvonne Bausback
Dept. Interventional Angiology
Division of Internal Medicine, Neurology and Dermatology
University of Leipzig, Germany
Disclosure

Speaker name: Yvonne Bausback

I have no potential conflicts of interest to report.
# Incidence, Etiology and Mortality of Acute Mesenteric Ischemia (AMI)

In 1 % causative for an acute abdomen, up to 10% in elderly

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Incidence</th>
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<tbody>
<tr>
<td>Arterial emboli</td>
<td>50 %</td>
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<tr>
<td>Arterial thrombosis</td>
<td>25 %</td>
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<tr>
<td>Non-occlusive mesenteric ischemia (NOMI)</td>
<td>15-20 %</td>
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<tr>
<td>Mesenteric vein thrombosis</td>
<td>5 %</td>
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</tbody>
</table>

Mortality acute SMA-occlusion 60-80 (100) %

Mansour MA. Arch Surg 1999
Standard therapy of an acute occlusion of the Superior mesenteric artery (SMA)

Goldstandard:
Laparotomy with
- Exploration / resection of the bowel
- Thrombectomy / patch-plasty of the SMA

Revascularization for acute mesenteric ischemia
(Ryer et al., J Vasc Surg 2012. Mayo Clinic Rochester)

Method of revascularization
Surgical  88 %
Endovascular 12 %
Endovascular techniques for recanalization of acute SMA-occlusions

- Catheter-aspiration
  - 8Fr brachial access
  - Often multiple attempts necessary / cumbersome

- Balloon-angioplasty / stent-implantation
  - Partially ineffective, fragmentation / embolisation

- Thrombolysis
  - Local long-term thrombolysis
  - Pulse-spray thrombolysis
Endovascular management of Acute embolic SMA occlusion: A 12 – year single centre experience (2003-2014)

37 patients: transcatheter embolus aspiration (n=37) + local thrombolysis (n=2)/ stent implantation (n=2)

Primary endovascular revascularisation + on demand surgery
For patients with acure SMA occlusion
Without signs of sepsis or severe peritonitis

In – hospital mortality 27.0 %
Thrombectomy-catheter for thrombotic venous / arterial occlusions

AngioJet (Medrad)

Rotarex (Straub Medical)
Thrombectomy-Catheter for acute SMA-Occlusions

Single-case-report

- AngioJet-thrombectomy successful in case of acute SMA-occlusion due to paradoxical embolism

Sternbergh WC, et al., *J Endovasc Ther* 2000

Single-case-report

- AngioJet-thrombectomy not sufficient
- Additional ultrasound-accelerated thrombolysis

Ballehaninna UK, et al., *Vascular* 2012
Rotarex™ for acute visceral occlusions

Vascular access:

- Left brachial artery
- 6F/ 90 cm (Cook)
- 0.018“ wire
- Microcatheter, e.g. Quickcross (Spectranetics)

Rotarex thrombectomy 6F
72 year old female pts.

LV-failure, EF 25%

Intermittent Afib

Acute SMA-occlusion
Passage with a 0.018“ GW and Support-catheter

Slow pull-back to estimate the length of the occlusion
Rotarex™ For the Treatment of Acute SMA-Occlusions

- 2011 – 2015:
- 16 patients with acute mesenteric ischemia and thrombotic proximal SMA-occlusions

Etiology of SMA-occlusions:
- Atrial fibrillation 9
- Acute myocardial infarction / LV-failure 5
- Multiple thrombus formations aorta 1
- Atherosklerotic occlusion 1
Clinical presentation

- Sepsis at time of admission (2/16) 12.5 %
- Mean bowel ischemia time (6 – 48 h) 15 h
  Lactate ↑ (15/16) 93.75 %
  CT: focal sign of malperfusion (9/16) 56.25 %
  Abdominal examination ++
  pain, hemorrhagic diarrhea, nausea 100%

Late AMI in 15/16 patients
Results: Rotarex™-Thrombectomy of Acute SMA-Oclusions

- Procedure time (17 – 48) mean 24 min
- Technical success 100 %
  + Stent implantation (3/16) 18.75 %
  + mechanical thrombectomy (7/16) 43.75 %
- 30 day mortality (6/16) 37.5 %
- 3 deaths after within 1 year (short-bowel-syndrome, cardiac, unknown)
- Ischemia-related mortality 43.5 %
Complications

- Mayor complication 12.5 %
  - Perforation (2/16)
    resolved by stentgraft implantation

- Minor complication 4/16 25 %
  - Peripheral embolisation/residual thrombus
    not relevant by collateral blood supply
Postinterventional course

- CT scan (6/16) 37.5%
- Laparatomy (10/16) 62.5%
- No resection (2/16) 12.5%
- Focal/limited bowel resection (3/16) 18.75%
- Extended bowel resection (2/16) 12.5%
- Not operable (2/16) 12.5%
- 1 refused to operation

50% of patients without bowel resection
Summary: Clinical Pathway including Advanced Endovascular Techniques

AMI
CT-Scan
Lactate
Abdominal examination

Endovascular revascularization

Laparoscopy
Laparotomy

ICU Monitoring
CT scan

IMMEDIATE SURGERY:
Severe Peritonis +++ SEPSIS