OPEN SURGICAL TREATMENT OF SPLENIC ARTERY ANEURYSMS IN THE ENDO ERA: INDICATIONS AND TECHNICAL TIPS

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DISCLOSURES

• nothing to declare

SPLENIC ARTERY ANEURYSMS (SAA'S)

- Represent 60% of all VAA's
- High mortality rates when ruptured
- Poorly defined natural history

SAA'S - OPEN OR ENDO ?

Contemporary Management of Splenic and Renal Artery Aneurysms: Results of Endovascular Compared with Open Surgery from Two European Vascular Centres

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SAA'S - OPEN OR ENDO ?

SAA'S - OPEN SURGICAL TREATMENT

SO, OPEN WHEN?

1. Unsuitable anatomy for endo
2. Hemodynamic instability
3. Endo not advisable
4. Failure of previous endovascular treatment

NOT ALL CASES ARE SUITABLE FOR ENDO !
### SAA's - Open Surgical Treatment

**1. Distal / Hilary SAA**
- Difficult to manage endovascularly
- Inability to preserve splenic perfusion:
  - Absence of distal landing zone for covered stenting
  - Massive splenic infarction after distal embolization

**Limitations are similar in open surgery:**
- Inability to preserve short gastric vessels
- Inability to reconstruct the splenic artery
- High risk of massive splenic infarction

#### What about Laparoscopic Open Surgery?
- Several cases of elective laparoscopic treatment of splenic artery aneurysms are reported in literature
- Nonetheless, intervention by such means in rupture is NOT ADVISABLE:
  - The retrogastric and intrapancreatic setting of SAA may be technically demanding and require long operating times
  - Proficiency with laparoscopic ultrasonography is essential
  - No RCT's available

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**2. Rupture**
- Medical emergency
- 25% mortality rate
- Need for rapid vessel control

- **Endovascular treatment limited by:**
  - Hostile vessel tortuosity
  - Time-consuming navigation

**Choice of open surgical approach differs depending on baseline anatomy**
- Proximal or mid-segment SAA's
  - Ligation of SA proximally to short gastric vessels
  - Possibility of SA reconstruction with direct end-to-end anastomosis

- Subcostal incision
- Midline incision
- Distal or hilar SAA's
- Aneurysm and spleen en bloc resection
  - High risk of massive splenic infarction
  - Inability to preserve short gastric vessels
PREGNANCY - OPEN SURGICAL TREATMENT

1. PREGNANCY

- High risk of rupture during THIRD TRIMESTER and PUERPERIUM
  - High levels of estrogen, progesterone and relaxin
  - Increased arterial stress
- SAA treatment is RECOMMENDED
- MANAGEMENT is DIFFICULT

2. PREGNANCY - OPEN SURGICAL TREATMENT

- ENDOWASCULAR treatment usually NOT RECOMMENDED
  - Potentially long procedures with exposure to ionizing radiation
  - Risk of teratogenic effects due to iodine contrast
  - Need for post-operative imaging control

3. PREGNANCY - OPEN SURGICAL TREATMENT

- OPEN interventions are also risky in such settings:
  - Minimally invasive approach should be opted
  - Spleen should be preserved whenever possible
  - Location of the aneurysm affects technique selection

AS SUCH...

OPEN SURGICAL TREATMENT

1. PROXIMAL SAA

- Direct arterial reconstruction
- Spleen preservation

OPEN SURGERY - MIDLINE INCISION

- Proximal clipping during laparoscopy could injure celiac trunk and/or left gastric artery

MID-SEGMENT SAA

- Direct arterial reconstruction
- Spleen preservation

MIDLINE INCISION

- Proximal and distal aneurysm clipping
- Spleen perfusion maintained through short gastric vessels
- Aneurysm resection can be performed

LAPAROSCOPIC SALIGATION

DISTAL SAA

- High risk of massive splenic infarction demands SPLENECTOMY!

SUBCOSTAL INCISION

- Aneurysm resection with splenectomy can be performed either by OPEN CLASSIC or LAPAROSCOPIC surgery, depending on the surgeon’s experience and patient characteristics
### SAA's - Open Surgical Treatment

**4. Failure of Endovascular Treatment**

- **Endovascular** treatment of SAA's should be the *first line* of treatment in the majority of patients
  - Low post-operative morbidity
  - Low risk of complications
- Hostile anatomy frequently difficults patient management in such way

| **Open Surgical Repair** should be used in such settings and technique selection
must be performed according to baseline anatomy |

### Conclusion

- Splenic artery aneurysms are cumbersome pathologies, with high mortality rates when ruptured
- **Endovascular Treatment** with splenic artery preservation should *always be considered*, although not always feasible
- Open surgery, either conventional or laparoscopic, allows for *proper treatment* of the majority of SAA's not treatable endovascularly

**Proper Technique Selection According to the Baseline Anatomy, Concomitant Co-Morbidities and Hemodynamic Stability is Essential for Patient-Specific Favorable Outcomes**