Isolated Mesenteric Artery Dissections

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Disclosures

• Nothing to disclose
Case Presentation – V.A. (2017)

- 45F h/o asthma developed sudden onset diffuse abdominal pain while driving. Pain was so severe, she pulled over and called 911, and was airlifted to nearby hospital. At that hospital, CTA demonstrated an isolated SMA dissection but no bowel ischemia with initial lactate of 2.5. She left that hospital AMA and presented to our hospital for further management. On arrival, she had only mild cramping abdominal pain. She was mildly tender to deep palpation in both lower quadrants. Labs: WBC 13.7, lactate 1.3.

- Tx: Bowel rest, serial abdominal exams, ASA 81 mg + heparin gtt
- Two days later, advanced to clear liquid diet, then regular diet
- Repeat CTA stable.
- Discharged home on LVX.
Case Presentation – V.A. (2017)
ISMAD – Epidemiology

• Rare entity w/o associated aortic dissection or connective tissue disorder

• Increasing incidence 2/2 use of CT scan to dx abdominal pain
  • Prior to 2001: 46 reported cases
  • As of 2016: 622 reported cases
  • Majority of cases in East Asian countries – genetic predisposition

• SMA = most common visceral artery affected, then celiac artery
  • ISMAD = Isolated superior mesenteric artery dissection

• 67-88% male; 5th to 6th decade of life
ISMAD – Etiology

• Connective tissue disorders (Marfan, EDS, Loeys-Dietz)
• Cystic medial necrosis, segmental arterial mediolysis, FMD
• Majority do not have any arteriopathies
• Risk factors: tobacco, atherosclerosis, EtOH use, obesity, heavy weightlifting, pregnancy
• Majority occur 1-3 cm from SMA ostium, where SMA transitions from fixed RP position with acute turn into a mobile mesenteric root → increased shear stress & hyperdynamic forces at this transition point
ISMAD – Presentation

• Incidental finding in up to one-third of patients
• Symptomatic cases:
  • Abdominal pain (90%)
  • Nausea, emesis, melena, diarrhea
  • Bowel ischemia → peritonitis
  • Aneurysmal formation with or without rupture → hemorrhagic shock
ISMAD – Diagnosis

- **CTA** – *gold standard*; ID dissection flap, false lumens, reentry tears, aneurysm formation and rupture; also ID end-organ malperfusion
- **MRA** – not as readily available
- **DSA** – reserve for those needing intervention
- **US** – difficult to visualize
- **Labs** – leukocytosis, elevated lactate, CRP/ESR
ISMAD – Classification

- Multiple classification systems developed by Sakamoto, Yun, Zerbib, and Luan
- **Yun** – most commonly used 2/2 simplicity
  - **Type I** – patent false lumen w/ re-entry site
  - **Type IIa** – patent false lumen w/o re-entry site
  - **Type IIb** – thrombosed false lumen w/o re-entry site
  - **Type III** – occluded SMA
- Based on series of 32 patients; unable to predict outcome or recommend treatment due to small sample size
- None widely accepted; have not improved clinical management
ISMAD – Treatment

• Depends on clinical presentation and course of the patient

• **Asymptomatic patients**
  • Consensus = manage medically
  • Role of antiplatelet vs. anticoagulants not well-defined

• **Symptomatic patients**
  • Initial tx = conservative management w/ bowel rest & observation esp. normal lactate & no leukocytosis
  • Role of anticoagulation not well-defined; most use at least short-term
  • Conservative management includes follow up radiographic imaging
  • Persistent symptoms → endovascular treatment
  • Peritonitis or hemorrhage → open surgery
ISMAD – Surgical Treatment

- Open approach preferred for those with intra-abdominal hemorrhage or advanced bowel ischemia
- Bowel resection + arterial repair
- Multiple options: ligation alone if sufficient collateral perfusion, aorto-visceral bypass, extra-anatomic bypass (gastroepiploic or hepatic inflow), intimectomy/fenestration + patch repair
ISMAD – Endovascular Treatment

- **Thrombolysis** – infrequently reported; mixed results
- **Embolization** – aneurysm formation or vessel perforation
- **Stenting** – only a few dozen cases reported in English literature
  - Most common indication = ongoing abdominal pain
  - Goal = elimination of stenosis caused by dissection & stabilization of vessel integrity to avoid late degeneration & aneurysm formation
  - Self-expanding bare metal stents preferred as typically not ostial lesions
  - Covered stents useful when excluding aneurysmal vessels
  - Intermediate-term patency appears high w/ low late recurrent dissection
ISMAD – Surveillance & Remodeling

• No consensus on surveillance, but routine follow up imaging suggested due to risk of aneurysmal degeneration
  • 1 month post-dx, every 6 mos first year, then annually
• More arteries remodel than form aneurysms
• Unclear if remodeling leads to better clinical outcomes
• Largest series of clinical follow up of SISMAD from a single institution
• 46 of 58 consecutive SISMAD pts prospectively observed (11/2001-11/2010) – managed conservatively w/ long-term follow up (23 mos)
• Conservative management = bowel rest, IVF, nutritional support, +/- antithrombotic therapy (n = 12). No difference seen b/w patients +/- antithrombotic therapy, so stopped antithrombotic therapy.
• Surveillance = CTA @ 1 month, q6mo x 2 yrs, then annual
• Results:
  • Morphologic improvement in 41.3%, no change in 43.5%, complete remodeling in 15.2%
  • No patients had progression of dissection or recurrent abdominal pain
  • Most radiographic changes occurred within 6 months after onset, then became stable
Antithrombotic therapy has no beneficial effect in conservative treatment of spontaneous isolated superior mesenteric arterial dissection

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Retrospective review: 79 cases of SISMAD treated conservatively 1/2004-12/2019 at single institution

30 no-A/C patients & 49 A/C patients
  • Prior to Dec 2016, all patients received antithrombotics
  • From Jan 2017, abandoned antithrombotics
  • No difference in baseline clinical characteristics, including initial angiographic features

Clinical outcomes: LOS, pain resolution time, image remodeling, and maximal remodeling time

Shorter length of stay in no-A/C group (2/2 initiation of Coumadin)

No differences in pain resolution time or remodeling

A/C does not affect outcomes
The Use of Antithrombotics Is Not Beneficial for Conservative Management of Spontaneous Isolated Dissection of the Superior Mesenteric Artery: A Meta-analysis

Sanghyun Ahn • Hyejin Mo • Ahram Han • ... Chang-Hyun Lee • Myoung-jin Jang • In Mok Jung •
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• Systematic review of 35 studies: 727 patients
  • Symptomatic 693
  • Asymptomatic 134

• No differences b/w conservative management with + without antithrombotics
  • Pooled resolution rate: 91% vs. 95%
  • Morphologic progression rate: 3% vs. 11%
  • Adverse event: 0% in both groups

A/C does not affect outcomes
Management of Spontaneous Isolated Mesenteric Artery Dissection: A Systematic Review

S. Acosta1,2 and F. B. Goncalves2

- Systematic review 97 studies: 4239 cases
  - 81% symptomatic & 19% asymptomatic
  - 80.4% SMA, 17.9% celiac

- Life-threatening complications:
  - 0.4% ruptured pseudoaneurysms
  - 46 splenic infarctions in 412 CA dissections
  - All 43 bowel resections in SMA dissections
    - Bowel resection rate 2.1%

- Management:
  - Conservative (82%)
  - Endovascular (n=657)
  - Open surgery (n=98)
  - Bowel resection (n=43)

- Conservative management (n=352):
  - No antithrombotic (72%)

- Complete remodeling in 43% of 593 symptomatic patients managed conservatively

- Late Intervention:
  - 13 endo & 8 open @ f/u in 15 studies
  - Indications = occlusive arterial disease & post-dissection aneurysm

- Mortality = 0.5% (21 of 3885 patients).
  - Number of deaths correlated with number of bowel resections

- Conclusions:
  - Conservative management = main tx
  - Only absolute indication for intervention = severe intestinal ischemia & peritonitis
  - No evidence to support use of antithrombotic therapy
• Retrospective review: 94 sx SMAD patients treated medically – 37 endo interventions
• Indications for endovascular repair: imaging features of SMAD (SMA aneurysm or >70% stenosis or occlusion), experience of surgical team, and patient preference
• F/u @ 1, 3, 6 mos, then annual DUS or CTA
• Technical success = 86.5%
  • Failure in 5 patients 2/2 guidewire not tracking into true lumen or unsatisfactory distal outflow
  • Mean f/u 33.6 mos

• More antiplatelets in endo group
• No SMAD-related deaths or SMA ruptures
• 9 had recurrent abdominal pain (4 endo)
• 6 re-interventions:
  • 1 stent-related dissection
  • 3 aneurysms in endo group
  • 2 abdominal pain in conservative group
• More complete or partial remodeling in endo group (81.1% vs. 44.4%)
• Higher rate of freedom from SMA stenosis or occlusion in endo group
• Endovascular & medical management result in similar satisfactory short-term and mid-term outcomes
• Systematic review of 21 studies: 611 SMAD treated endo
• Technical success: 94% & Symptom resolution: 99%
• Short-term: Complication rate 1%, mortality rate <1%, reintervention rate <1%
• Long-term: Symptom recurrence 3%, new dissection creation 1%, aneurysm progression 2%, reintervention 2/2 complications 3%
• High levels of stent patency 98% & complete remodeling 88%
• In-stent stenosis rate of 12%
ISMAD – Conclusions

• Rare entity diagnosed more frequently on CT scan
• Majority of patients may be treated conservatively without antithrombotic therapy
• Absolute indications for surgical intervention include bowel ischemia and hemorrhage
• Other indications for intervention are unclear – persistent abdominal pain, evidence of SMA degeneration
• Endovascular repair demonstrates high rates of stent patency and complete vessel remodeling – however, correlation between vessel remodeling and clinical outcomes is unclear
Case Presentation – V.A.

- No recurrence of abdominal pain
- F/u imaging at 3 month intervals x 2, then 6 months, then annual with almost complete remodeling of the SMA
- Anticoagulation d/c’ed, given ASA 81 mg QD alone
- 2020 – 11 yo daughter with congenital ventriculomegaly, developmental delay, and epilepsy – genetic testing with pathogenic variant a/w vascular EDS
- Patient underwent whole exome sequencing → diagnosed with vascular EDS
Case Presentation – V.A.

February 2018
Case Presentation – V.A.

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References


