Focal Renal Artery Dissections (RAD)
Pathogenesis

• *Hematoma between intima/media via primary intimal tear*

• *Hemorrhage from vasovasorum*
Etiology

- *Incidence* 0.036-0.049%
- *Occurs in age* 40-60s
- *Male:female = 4:1*
- *No predilection for either side*
- *10-15% bilateral*
### Table 1 – Classification of renal artery dissection.

<table>
<thead>
<tr>
<th>Classification of renal artery dissection</th>
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<tbody>
<tr>
<td>1. Isolated RAD</td>
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<tr>
<td>a. Primary Spontaneous RAD</td>
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<tr>
<td>i. Atherosclerosis</td>
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<td>ii. Fibromuscular dysplasia</td>
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<td>iii. Other connective tissue disorders</td>
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<td>iv. Idiopathic</td>
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<td>b. Secondary</td>
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<td>i. Trauma</td>
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<td>ii. Iatrogenic Interventional procedures</td>
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</tbody>
</table>
Symptoms

- Clinically silent
- Symptomatic
  - Abdominal and/or flank pain
  - Nausea/vomiting
  - Headache
  - Dysuria
  - Hematuria
  - Hypertension
Diagnosis (Laboratory Tests)

- Elevated BUN/Cr
- Elevated LDH (degree of renal infarction)
Diagnosis (Imaging)

- Angiography
- CTA
- MRA
Treatment

• **Goals**
  - Treat renovascular HTN
  - Preserve renal function

• **Types of therapy**
  - Conservative management
  - Endovascular therapy
  - Open surgical therapy
Treatment (Conservative)

- Appropriate for **stable** renal function and symptoms and when BP can be pharmacologically controlled
Treatment (Conservative)

- **Pain control**
- **Blood pressure control** (<140/90 mmHg)
- **Anticoagulation (AC)**
  - Purpose: prevent false lumen thrombus propagation, which would occlude the true lumen
  - AC during hospitalization, then transition to antiplatelet agent x 6 mo
  - AC for 3-6 mo based on carotid dissection and DVT literature
Treatment (Surgical)

- Intractable severe HTN despite maximal medical therapy
- Significant deterioration of renal function in presence of hemodynamically significant occlusions of main renal artery or major segmental branches
Treatment (Endovascular)

- Stenting
- Coil embolization
- Thrombolysis
Stenting
Thrombolysis
Thrombolysis
Thrombolysis
In-situ arterial reconstruction (aortorenal bypass)

Extracorporeal reconstruction (complex reconstructions involving branch vessels)

Nephrectomy (large renal infarction with significant renal dysfunction)
Focal Superior Mesenteric Artery Dissection
Etiology

- **Incidence 0.06%**
- **Male predominance (~age 50’s)**
- **Predilection for proximal SMA**
- **More common in Asian countries (Korea, Japan, China)**
Etiology (Risk Factors)

- Atherosclerosis
- Fibrodysplasia
- Abdominal trauma
- Medial degeneration
- Vasculitis
Symptoms

- Abdominal pain
  - Nausea/vomiting
  - Diarrhea
Natural History

- Limited progression with thrombosis of false lumen
- Progressive dissection of vessel
- Expansion of false lumen, with subsequent narrowing/obliteration of true lumen
- Rupture of vessel via adventitia
Fig. 1. Classification of spontaneous dissections of the visceral artery (Sakamoto’s classification). Type I: patent false lumen with both entry and reentry; type II: “cul-de-sac”—shaped false lumen without reentry; type III: thrombosed false lumen with ulcer-like projection, defined as a localized blood-filled pouch protruding from the true lumen into the thrombosed false lumen; type IV: completely thrombosed false lumen without ulcer-like projection.
Diagnosis (CTA)

- **Entry and reentry sites of dissection**
- **Diameter and length of dissected segment**
- **Patency of false and true lumens**
- **Identify major collaterals**
- **Presence of mesentery hematoma**
- **Signs of bowel ischemia**
Fig. 1. Measurement of distance from the lowest margin of the pancreas to an entry site of dissection on computed tomography scan. Cross-sectional view at the level of (A) the most proximal entry site and (B) lowest margin of pancreas. (C) Three-dimensional reconstructed lateral view showing the relative position of an entry site of spontaneous isolated superior mesenteric artery dissection and pancreas body (P).
Treatment

- Conservative management
- Endovascular therapy
- Open surgical therapy
Treatment (Conservative)

- *Bowel rest (reduce demand for mesenteric blood flow)*
- *Intravenous fluids*
- *Nutritional support*
- *+/- Anticoagulation*
Treatment (Intervention)

- Signs of bowel infarction (open surgery)
- Signs of arterial rupture (open surgery)
- Persistent abdominal pain despite medical management (endo vs open)
- Severe compression/occlusion of true lumen (endo vs open)
- Aneurysmal dilation of SMA (endo vs open)
Treatment (Endovascular)

- Self-expanding stent in true lumen
- Coil embolization of PSA in dissected SMA
- Thrombolysis for thrombosed SMA
References


Hare W, Kincaid-Smith P. Dissecting aneurysm of the renal artery. Radiology. 1977; 97: 255-263. (Slides 6,8)


References


