CAIR Case of the Month

Case Courtesy of Drs. C. Roscher and H. Hennessey
University of Manitoba

Clinical Presentation

- 65 year old female presenting to ER with chest pain and uncontrolled hypertension

- PMH
  - Smoker (15 pack years)
  - T2DM

- Labwork
  - Normal CBC/ INR
  - Cr 171
  - Tnt 54

- Previous imaging in 2009 demonstrates total chronic occlusion of the right and near total occlusion of the left renal arteries

Clinical Course

- Admission to Cardiology for work up of NSTEMI and hypertension management
- Patient's beta blocker and calcium channel blocker titrated without successful blood pressure control (average 136/96)
- Interventional cardiology recommended cardiac angiography for workup of chest pain

Clinical Course

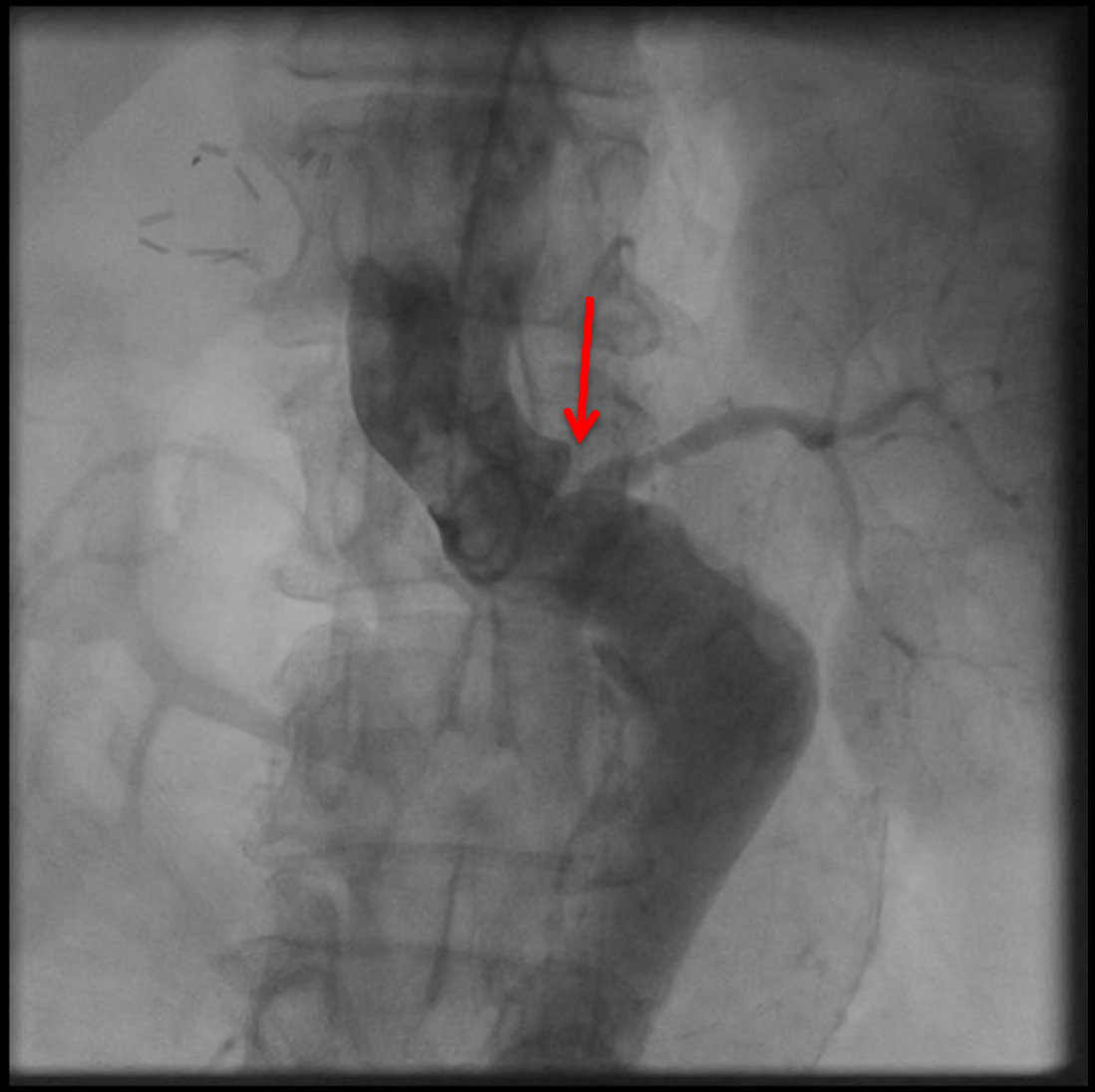
- During the cardiac cath, the Interventional Cardiologist asks for an IR opinion regarding renal artery revascularization

- After evaluation of the patients imaging and chart, IR relayed revascularization would be difficult and was not indicated at this time
  - Chronic occlusion right iliac
  - Left to right cross femoral bypass
  - Full metal jacket left iliac stents
  - Infrarenal AAA (not imaged since 2009)

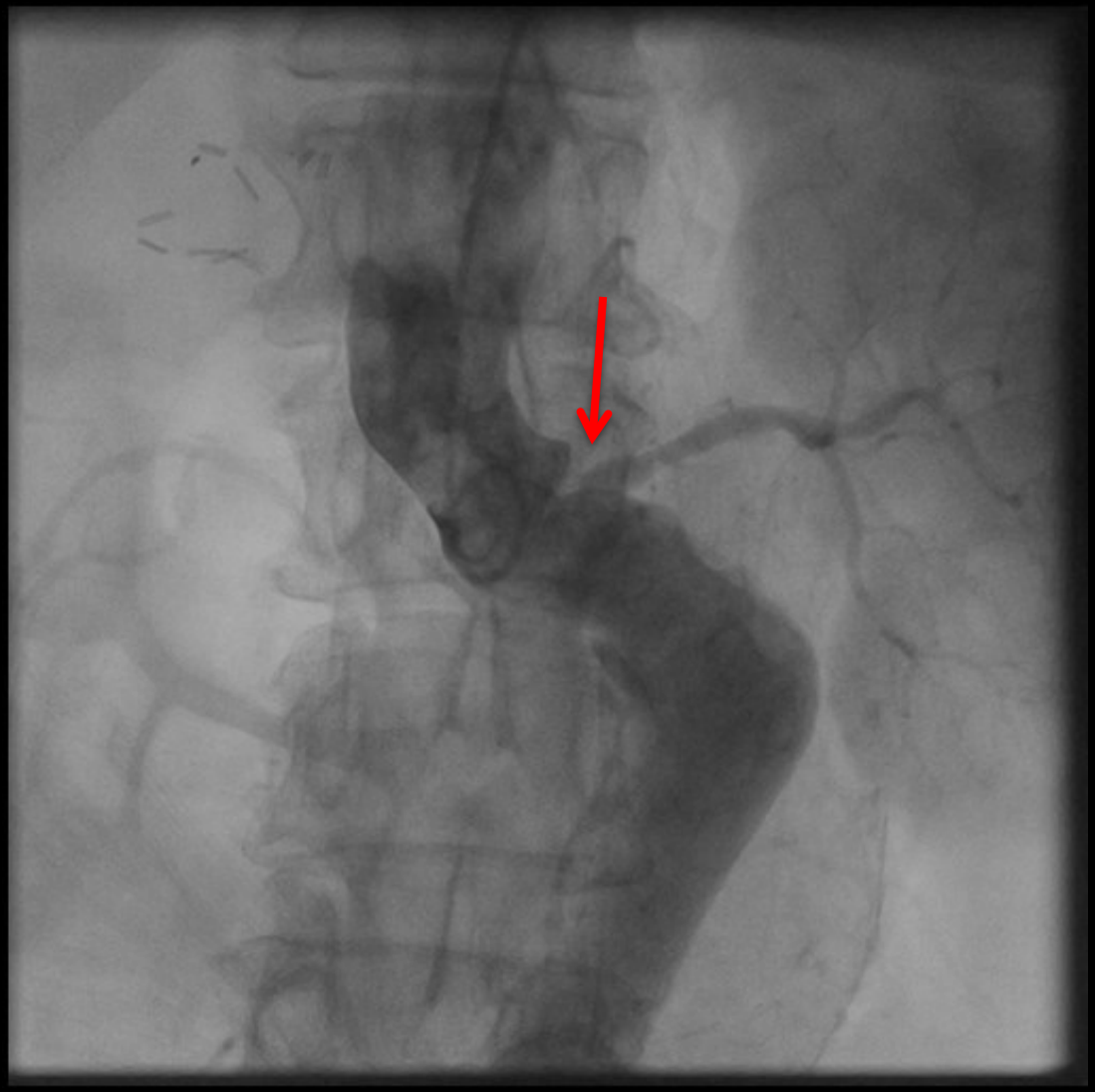
Clinical Course

- IR recommends repeat imaging of infrarenal AAA prior to consideration of revascularization
- Interventional cardiologist proceeds with attempted revascularization

Interventional Cardiology



Interventional Cardiology



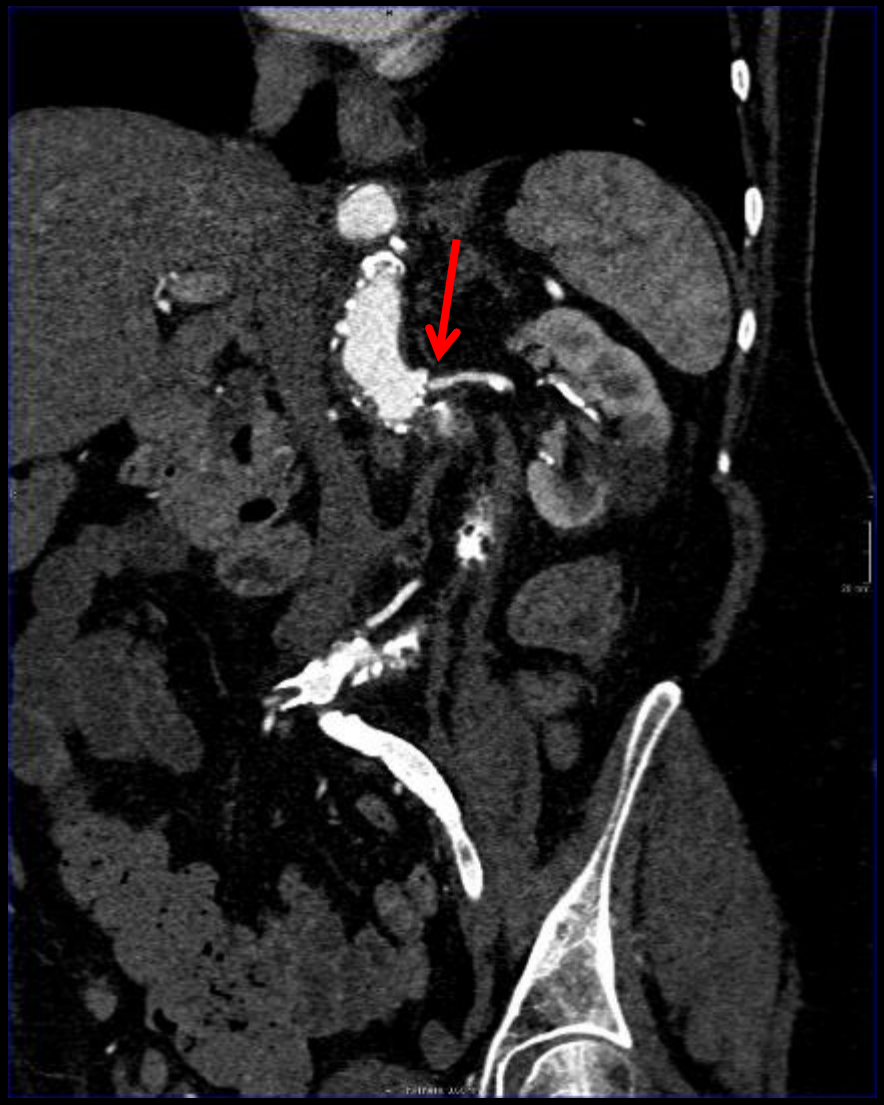
Interventional cardiology confirms near complete occlusion of the left renal artery

Multiple attempts by interventional cardiologist to cannulate the left renal ostium fail

Clinical Course

- Post cardiac catheterization the patients renal function worsens and multiple episodes of flash pulmonary edema occur
- IR is consulted for left renal vascularization
- CTA is performed for further evaluation

Initial CT



CT Findings

- Moderate diffuse atherosclerotic disease

- Total chronic occlusion of the right renal artery
- Near complete occlusion of the proximal left renal artery (99% stenosis)

- Bilateral renal atrophy and cystic renal parenchyma, worse on the right

- No evidence of aortic dissection
- No evidence of fibromuscular dysplasia

IR Consultation

- Due to worsening renal function, uncontrolled hypertension on two agents, and recurrent flash pulmonary edema, revascularization of the left renal artery was attempted

Conventional Angiography

Conventional Angiography

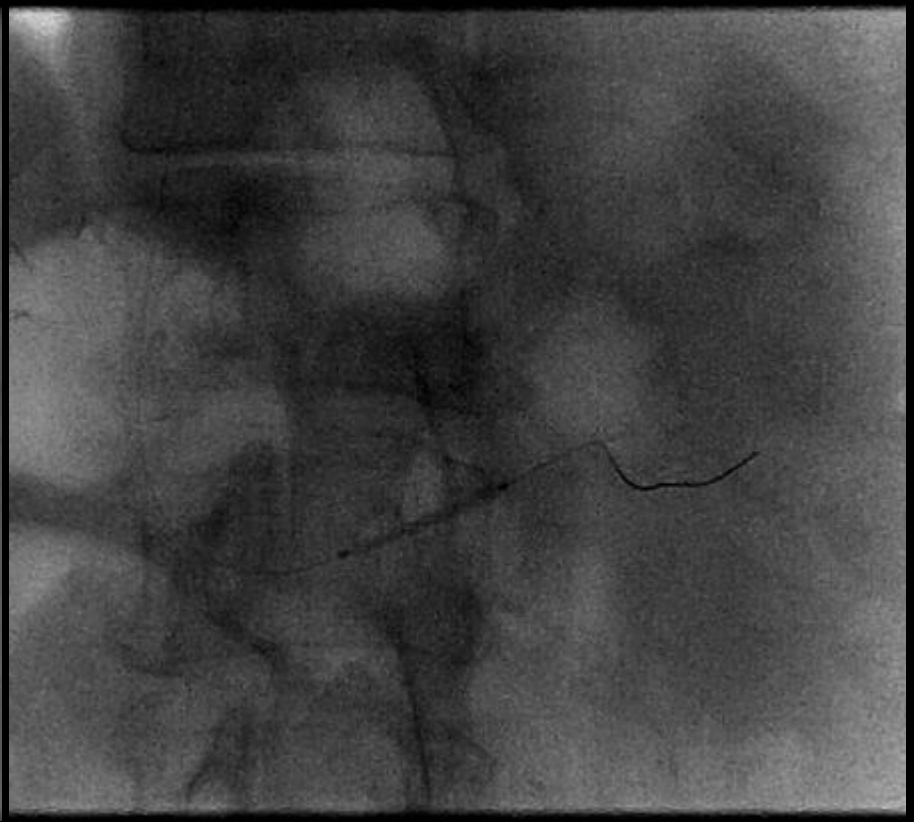
Retrograde left brachial artery approach

Severely Stenotic left renal artery

Conventional Angiography

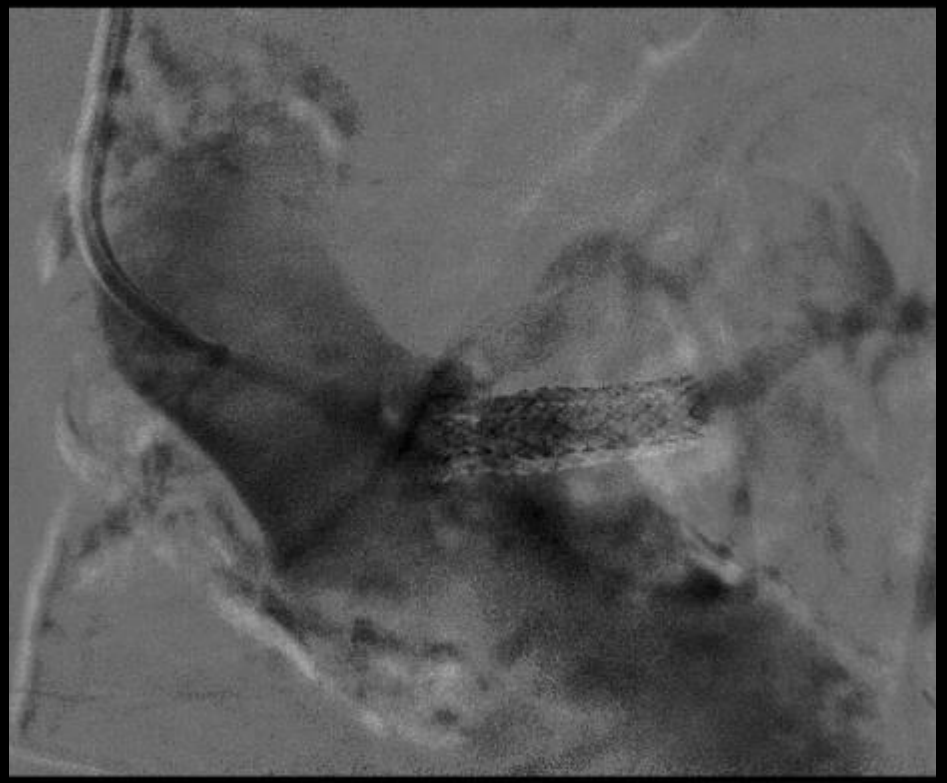
Super selective left renal artery

Conventional Angiography



Pre-dilation with 3 mm balloon

Conventional Angiography



Conventional Angiography

5 x 19 mm bare metal stent

Post-Procedure

- Left brachial artery hemostasis with manual compression
- Plavix initiated
- Over course of five days blood pressure averaged 122/76 (SBP decrease by 14) on two anti-hypertensive medications
- No further episodes of flash pulmonary edema
- Creatine remained elevated at 235
- Patient discharged home one week after left renal artery stenting

Discussion

- Renovascular hypertension (RVH) accounts for 5% of hypertensive patients

- Renal artery stenosis (RAS): greater than 50% luminal narrowing of the proximal renal artery
  - Atherosclerosis (75%)
  - Fibromuscular dysplasia (~25%)
  - Renal artery dissection/thrombus (rare to cause RVH)

Treatment of RAS

- Controversial
  - Randomized Control Trials (RCTs) demonstrate no clinical benefit of renal artery angioplasty/stenting over optimized medical therapy (OMT)
    - Several studies denote a reduction in number of anti-hypertensive medications to achieve blood pressure control in revascularization group
    - Study designs of landmark trials fraught with bias
    - No clinical benefit for preservation of renal function
    - Revascularization did not improve number of cardiac disturbance syndromes in RCTs, benefit seen in small observational studies
  - A single RCT demonstrated a significant clinical benefit of revascularization over OMT in patients with bilateral RAS compared to unilateral
    - On average 20 mmHg decrease in BP

Considerations

- Percutaneous intervention is not benign (major complications <3%)
  - Puncture site hematomas
  - Arterial dissection/thrombosis
  - Pseudoaneurysm/fistula
  - Retroperitoneal bleed