

Fibromuscular Dysplasia (FMD) in Renal Arteries

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Disclosure

Speaker name: Amit J Dwivedi

I have the following potential conflicts of interest to report:

Consulting (Cook, Gore, Bard, Abbott, Medtronic, Penumbra)

Employment in industry

Stockholder of a healthcare company

Owner of a healthcare company

Other(s)

I do not have any potential conflict of interest

What is FMD?

- First described in 1938 (J Urol)
- Non atherosclerotic aneurysmal and occlusive disease of renal artery
- Commonest artery with dysplasia followed by carotids and iliac artery
- Incidence unknown but said to be less than 5%
 - 2nd most common pathologic lesion responsible for renovascular hypertension

Types

- Intimal Fibroplasia (5%)
- Medial Hyperplasia (less than 1%)
- Medial Fibrodysplasia (85%) Commonest referred commonly as FMD
- Perimedial Dysplasia (10%)

Intimal Fibroplasia

- Primary or Secondary
- Primary – Usually Unilateral , Main Renal artery with smooth focal stenosis
- Microscopically subendothelial mesenchymal cells irregularly arranged and usually internal elastic lamina identifiable
- Secondary- Most bilateral, long tubular stenosis
 - Likely related to arteritis
- Dyplastic changes in outer layers of vessel wall also involved

Medial Hyperplasia

- Unusual cause
 - Women 4th or 5th decade
 - Mid portion renal artery
- Increase in smooth muscle cell numbers
 - Intima and adventitia normal
 - controversial lesion

Medial Fibrodysplasia

- Commonest usually called FMD
- Uncommon in African Americans
 - 4th and 5th decade of life
- Can range from solitary focal stenosis to the commonest presentation with series of stenosis and aneurysmal outpouchings
 - String of beads appearance

Medial Fibrodysplasia



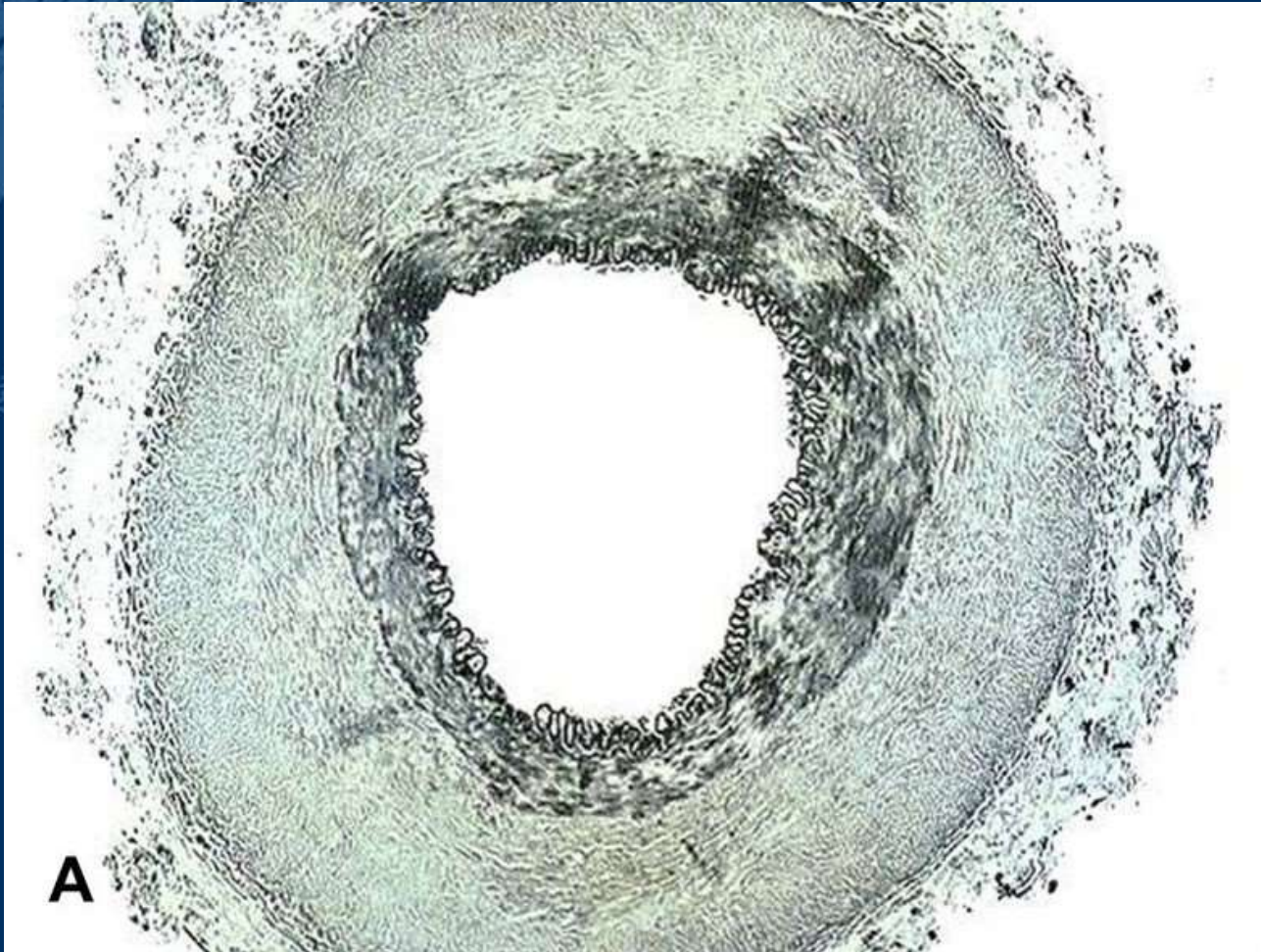
FMD (Medial Fibrodysplasia)

- Affects distal main renal artery
 - Bilateral disease 60-70%
 - Progression is common

Two forms

- Peripheral (disease through outer media)
- Diffuse (entire media) this is commonly seen
 - Internal elastic lamina fragmented

FMD Histopathology



Perimedial Dysplasia

- It may coexist with medial fibrodysplasia
 - Usually women
- Main renal artery without mural aneurysms
- Minimal increase in medial ground substance with intact smooth muscle cells

Indications of Treatment

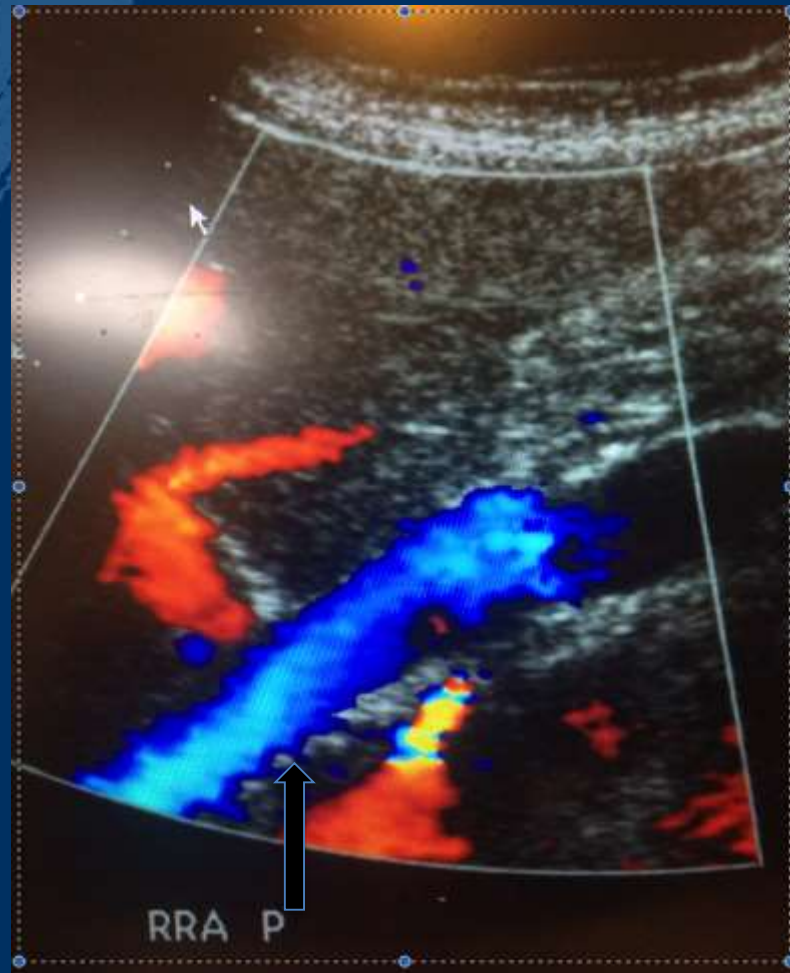
- Presence of moderate to severe hypertension
 - Hemodynamically significant renal artery stenosis
 - Evidence of functional importance of the stenosis

No need to do fly by interventions

Imaging Diagnosis

- Renal Duplex sonography
 - MRA
 - CTA
 - Radionuclide scans
- Angiography (Gold standard)
 - Renin assays

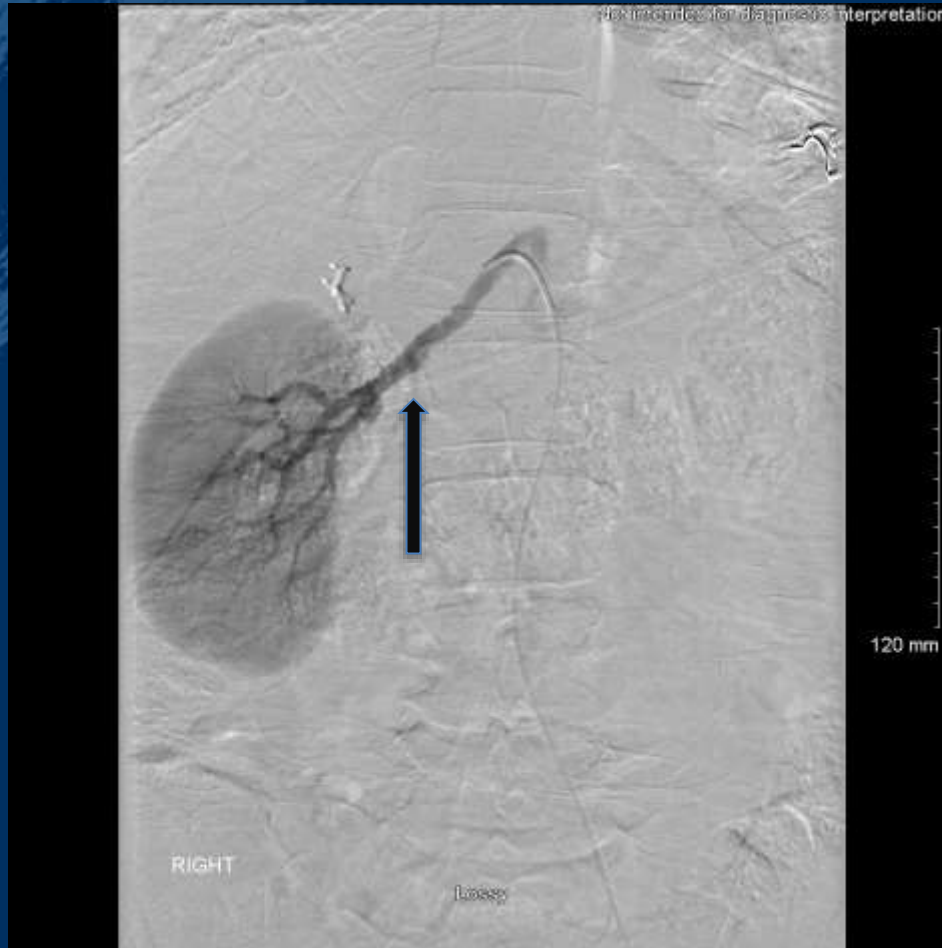
Duplex USG (FMD)



CT Scan FMD (Not a Great test)



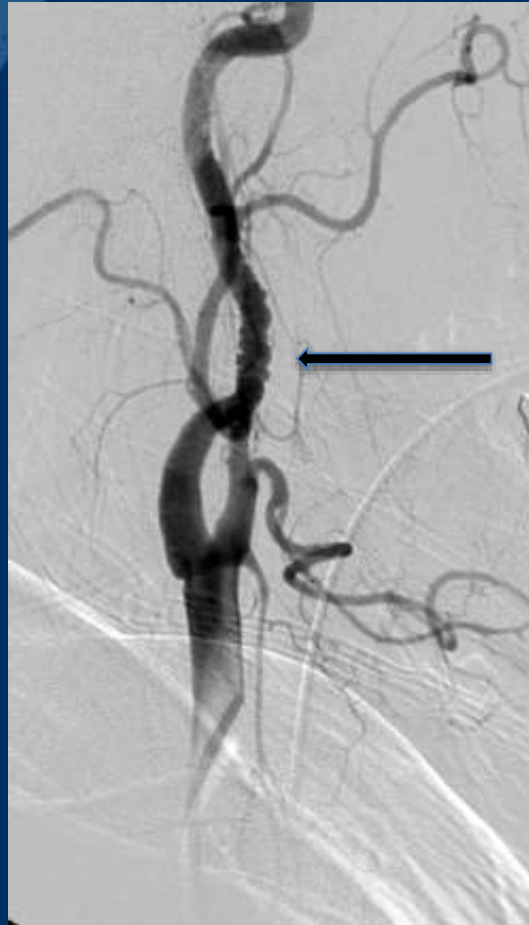
Gold Standard (Angiogram)



Selective Angiogram



Associated Pathology (ICA)



Associated Pathology (Iliac artery)

Fig 5



Treatment

- Drug Therapy
- ACE inhibitors (renal function impaired)
 - Angiotensin II antagonists
 - Beta blockers
 - Diuretics
 - Ca channel blockers

Treatment

- 90% of FMD treated with PTA
- Stenting reserved for perforations or dissections with thrombosis
- Autologous vein graft for adults and hypogastric artery for children
 - PTFE for main renal artery may be used.
- In situ repair if branch arteries not involved
- Ex vivo repair for extensive or complex disease

Treatment

- Access secure with sheath in place
- Cannulation with cobra/vanchi/omni sos
 - 0.014/0.018 system
 - Dilate with smaller balloon if needed
- 1:1 dilatation (based on normal caliber vessel at that location)
 - 2 mins slow dilatation
 - Systemic heparin

Complications

- Perforation
- Dissection
- Thrombosis
- Anastomotic stenosis (post surgery)
- Vein grafts dilatation (post surgery)

Our Experience

Last 13 years

32 patients treated

24 Female 8 Male

Hypertension the one symptom (More than 3 antihypertensives (HTN) on average)

31 patients treated with PTA

1 treated with surgical repair (in vivo)

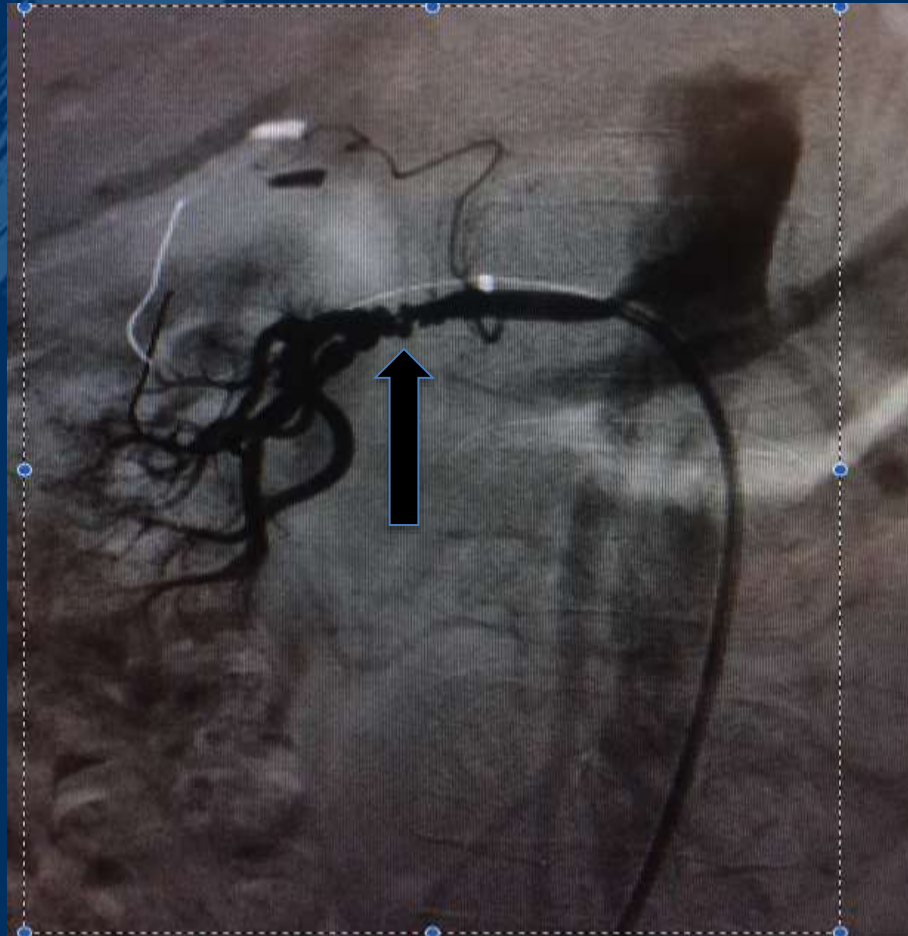
Symptoms improved with HTN in 28 patients to two or less antihypertensive

1 complication perforation

Moderate FMD



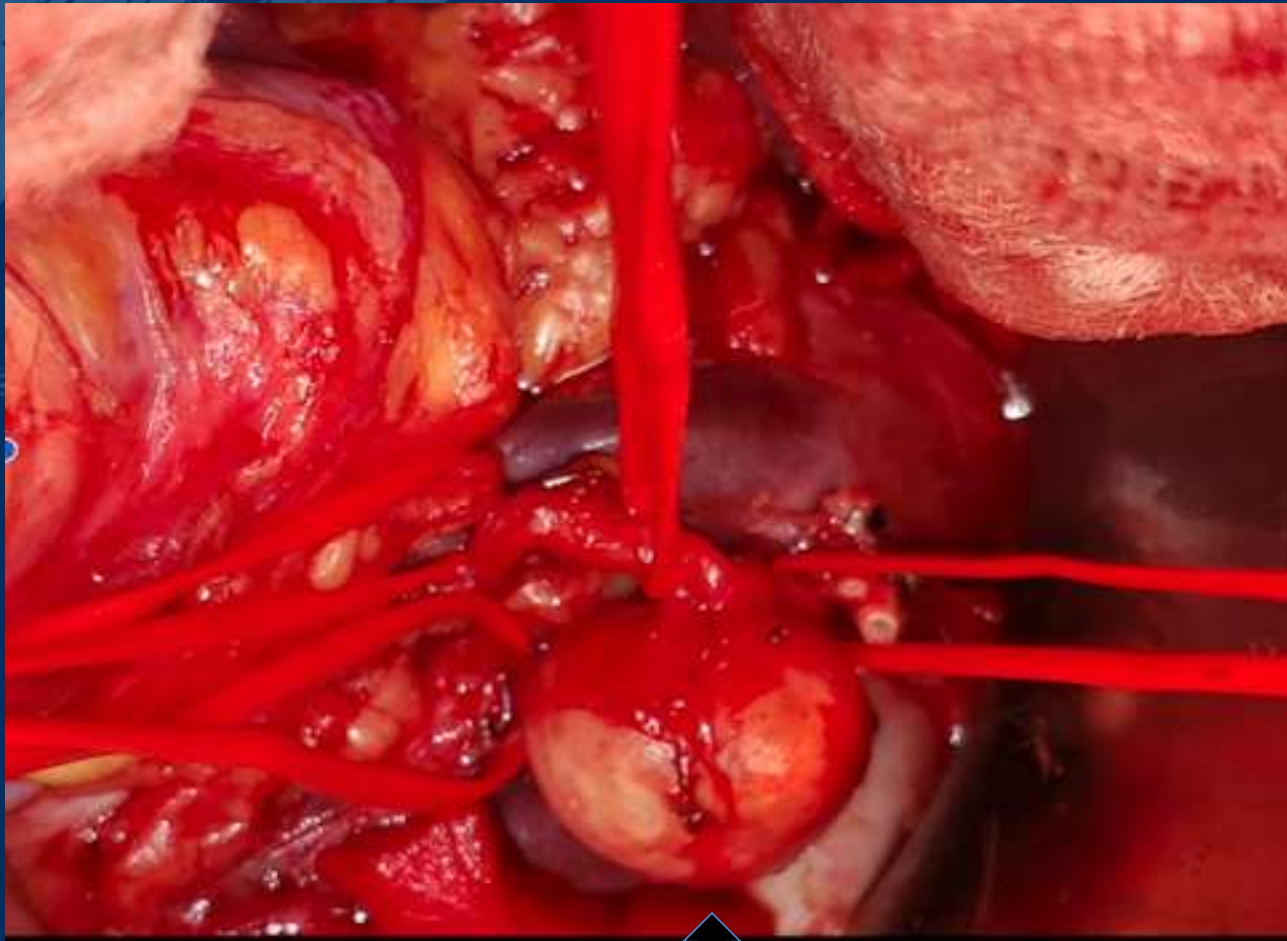
Pre treatment FMD



Post Treatment FMD



Complication post angioplasty pseudoaneurysm



Conclusion

- Young patients with renovascular hypertension with renal artery stenosis
 - PTA Treatment of choice
 - Stents rarely needed
 - Be aware of complications
 - Open surgery rarely needed

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