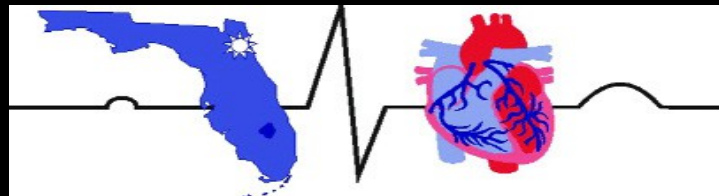


Celiac Artery & Superior Mesenteric Artery Disease, Diagnosis, and Treatment

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DISCLOSURES

- None that pertain to this meeting



Objectives

1. Present the prevalence of mesenteric artery and renal artery ischemia in the cardiovascular patient.
2. Present the clinical presentations of celiac compression syndrome and FMD in the adolescent patient
3. Become familiar with sensitivity and specificity of Non-Invasive Vascular studies when compared to MRA and CTA.



Prevalence of Mesenteric artery Stenosis
(MAS) in *the cardiovascular Patient*

○ Total of 553

Cardiovascular
participants had
visceral duplex



Prevalence of MAS Con't

- There was no significant difference in age, race, gender, body mass index, blood pressure, cholesterol, or low-density lipoproteins for participants with or without MAS.



MESENTERIC ISCHEMIA

ACUTE

- Severe abdominal pain, concentrated in one area of the abdomen

Early Signs

- Nausea and/or vomiting
- Bloody stools
- History of chronic atrial fibrillation or cardiovascular disease

CHRONIC

- Abdominal Pain (post-prandial)
- Bloating
- Weight Loss (unexplained)
- Diarrhea
- FEAR OF FOOD (abnormal changes in dietary habits)
- Vague or confusing clinical picture of abdominal pain

PROGNOSIS

ACUTE

- Prognosis is poor given death of the intestine often occurs before surgery is done.
- However, when diagnosed and treated right away, patients with acute mesenteric ischemia can be treated

CHRONIC

- In the case of chronic mesenteric ischemia, the outlook after a successful surgery/intervention is good.

Mesenteric Imaging CMS Testing Indications

- 坛 Mesenteric Ischemia (Post GI Testing) ****
- 坛 Abdominal Bruit*****
- 坛 Post Prandial Abdominal Pain
- 坛 Abdominal Pain (Acute or Chronic)
- 坛 Weight Loss (Abnormal)
- 坛 Bloating (Chronic)
- 坛 Diarrhea
- 坛 Acidosis (Acute)
- 坛 Post Stenting/Bypass (Follow at 1,3, 6 ,months, then annually)



CTA and MRA

Duplex Ultrasound

CTA, MRA, and DUPLEX

Sensitivity and Specificity
≥80%

CTA

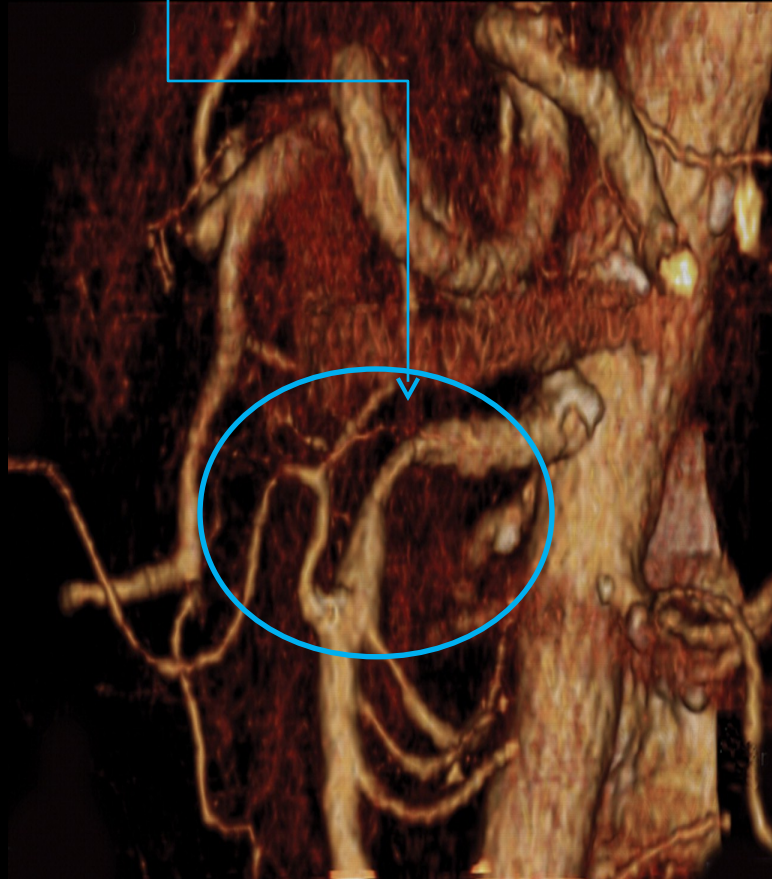
In the Detection of >70%
Stenosis

of SMA and Celiac

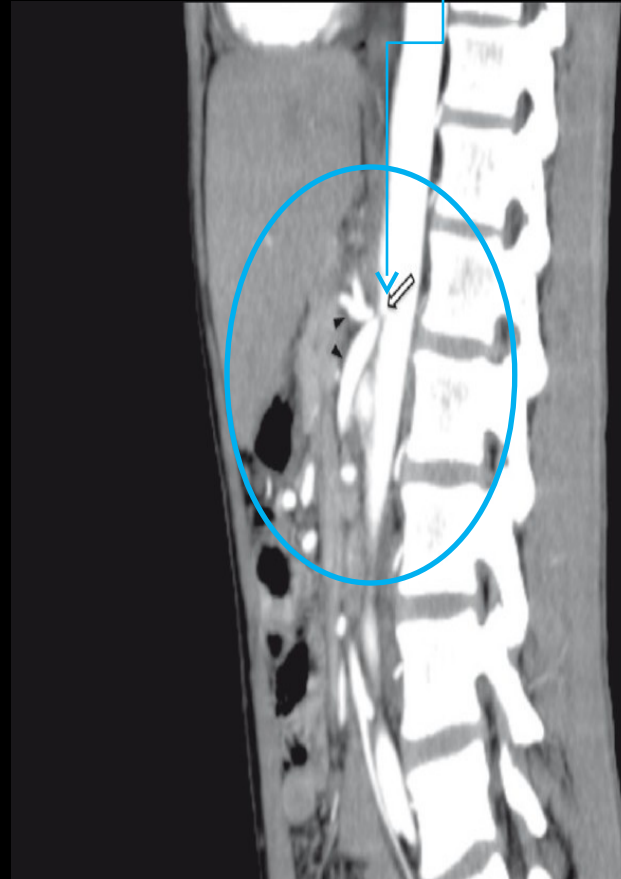
○ 100%

○ Operator Dependent

CTA of Severe
SMA Stenosis



MRA of Celiac
Compression



Mesenteric Duplex

Pros

- Non-Invasive
- Inexpensive as a screening tool
- No tubes, gyros, or spaceship
- *If positive Angiography is the next logical step*

Cons

- Operator dependent
- Overlying bowel gas
- Body Habitus



Mesenteric Duplex

FR 38Hz
IS

ID
43%
> 48
Low
iGen

AO P



GE Healthcare
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ABD, LIVER, PANC, CF
D000234479

MI 0.5 TIs 0.7 M7C
Abdomen



B
0- Fra 8.0 MHz
Gn 26
S/A 3/0
Map D/1/1
D 12.0 cm
DR 72
FR 14 Hz
AO 100 %

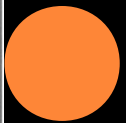
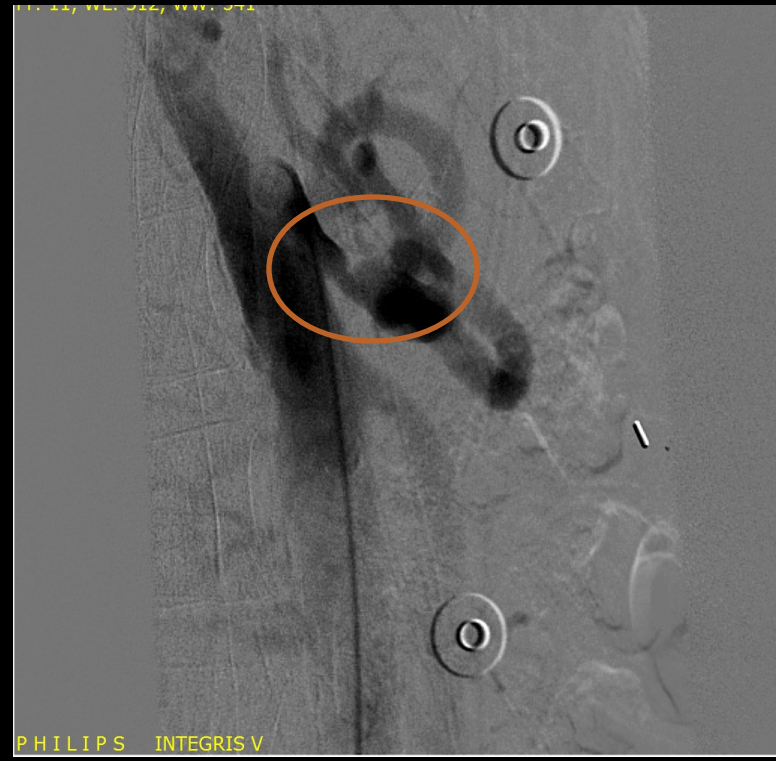
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Median Arcuate Ligament Syndrome

Without Breath Hold

With Breath Hold




Prevalence of celiac compression syndrome in young adults

- **Methods.** A total of 3449 patients from 0 to 18 years were investigated
 - **Symptoms.** included, among others, abdominal pain (71%), nausea (29%), thoracic pain (22%), heartburn (17%), weight loss (15%), vomiting (15%), systolic murmur (15%), postprandial accentuation of symptoms (15%), diarrhea (14%), respiratory discomfort (14%), and syncope (12%).
 - **Results.** 59 patients out of 3449 were positive for MAIS
- 

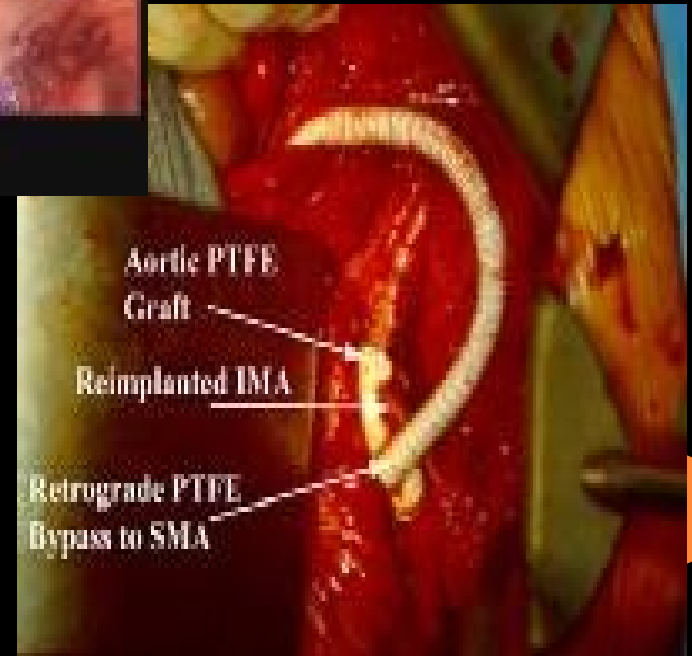
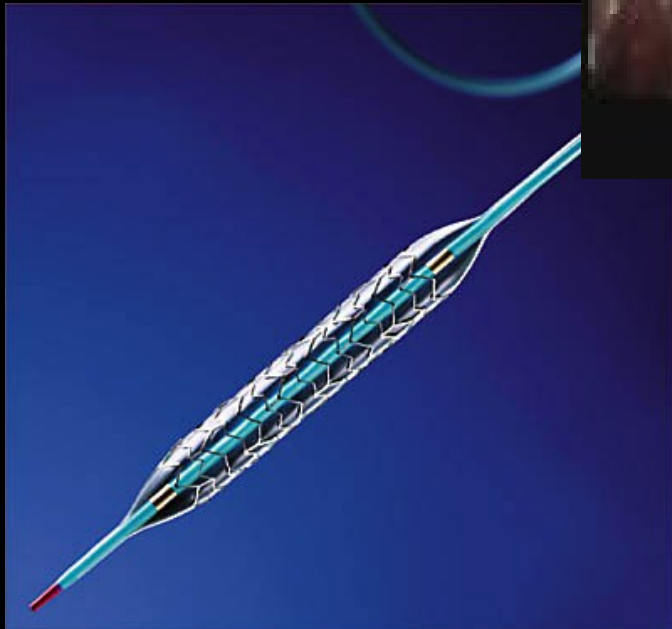
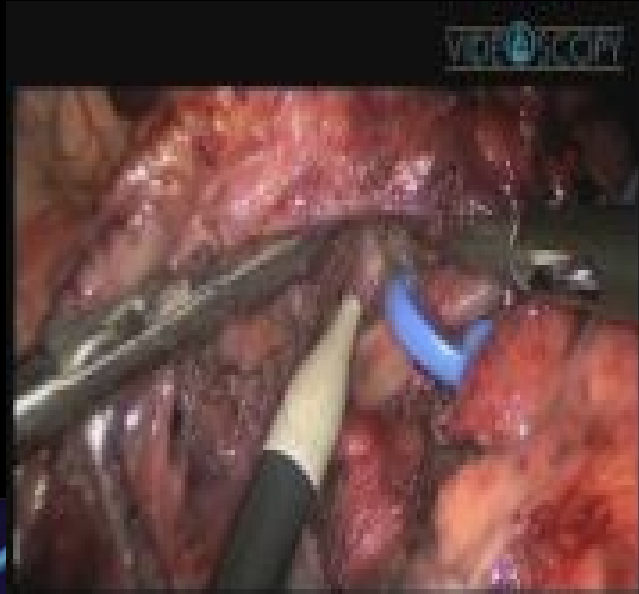
Celiac disease Con't

Median Arcuate Ligament Syndrome

- Compression of the celiac artery with expiration (causes pseudo stenosis)
 - Relieved with deep inspiration
 - Can be positional *****
- 

Treatment options

- Open Repair
- Endovascular
- Laparoscopic



Procedural vs Surgical Outcomes

- **Mesenteric stenting for CMI can be performed with low perioperative risk. Compared to mesenteric Surgical bypass. Stenting offers a much safer & less morbid option.**
- **Unfortunately, restenosis and the need for re-intervention are still an issue, and Sonographic close follow up is recommended to maintain secondary patency.**
- **The number of vessels to intervene on in patients with multi-vessel mesenteric stenosis needs further investigation.**



Renal Artery Ischemia



HYPERTENSION

RENAL ARTERY STENOSIS

About **1 in 3 U.S. adults**—an estimated **68 million people**—has high blood pressure and 3%-5% of this group has renal arterial disease.



Atherosclerotic Renal Ischemia

- Atherosclerotic RAS (ARAS) is a common condition that is often but not necessarily associated with HTN. Because of its progressive nature, ARAS is becoming one of the leading causes of end-stage renal disease (ESRD).
- Indeed, ARAS is reported to progress within 5 years in 51% of patients, and renal atrophy develops in 21% of patients in whom ARAS is initially greater than 60% of the caliber of the vessel.



FMD What Is It?

FMD


- A congenital dysplastic lesion, secondary to poor development of the fibrous, muscular and elastic tissue of the artery.
- Affects the medial layer of the artery, and usually found in the distal two thirds of the artery.

Types of FMD

1. **Medial FMD** (case scenario) accounts for 75-85% of all dysplastic lesions
2. **Intimal FMD** accounts for 5-10% and found mostly in children, affecting males and females equally, found in the proximal

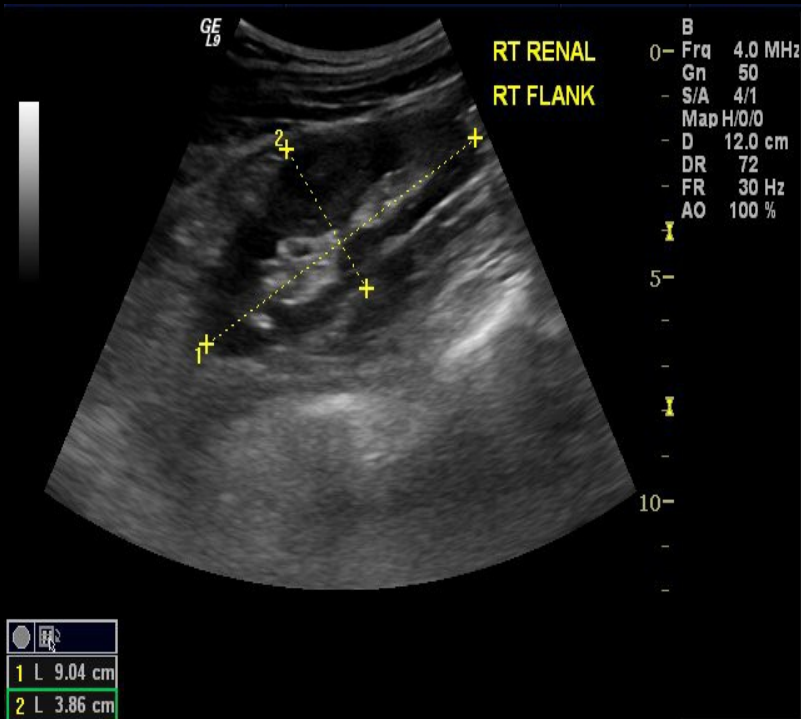


RENAL DUPLEX CMS INDICATIONS

- NEW DIAGNOSIS OF HYPERTENSION 401.9
 - RENO VASCULAR HYPERTENSION (MALIG)
405.01
 - UNCONTROLLABLE HYPERTENSION 401.0
 - KNOWN RENAL ARTERY STENOSIS 440.1
 - RENAL INSUFFICIENCY 593.9
 - RENAL FAILURE ???
 - ELEVATED CREATINE / METABOLIC LEVELS ???
 - FOLLOW-UP POST REVASC ??
 - KNOWN RENAL ARTERY ANEURYSM 442.1
- 

Renal Size and Reporting

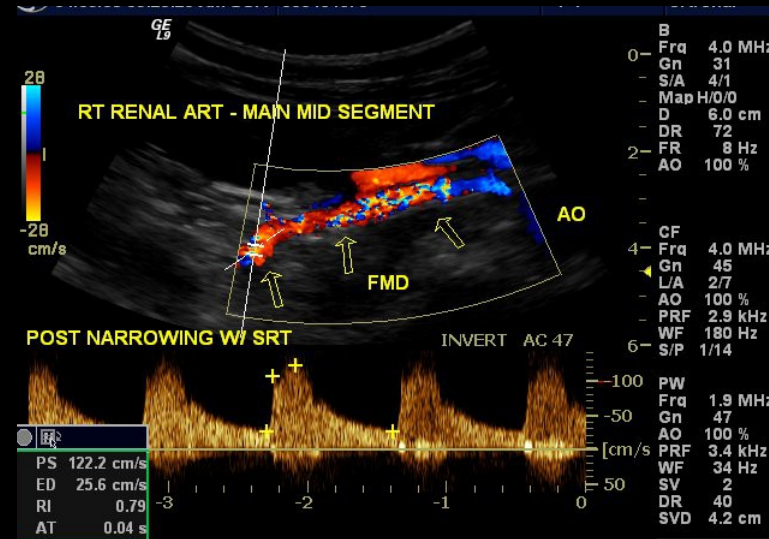
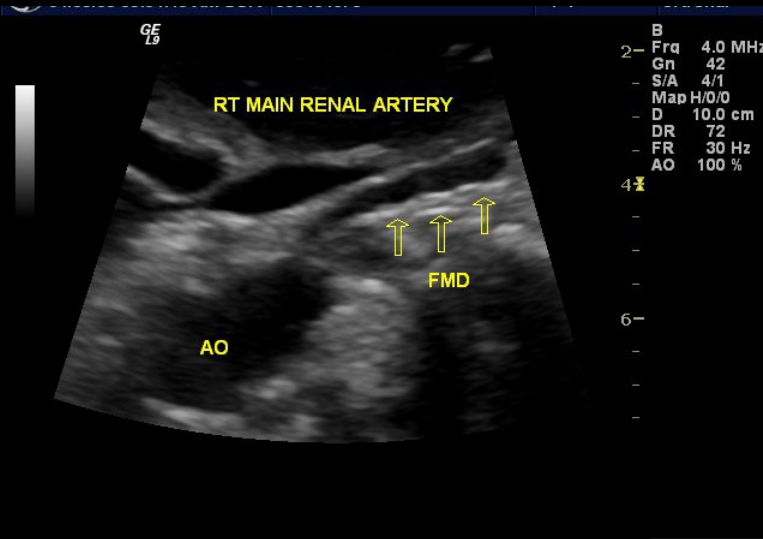
- When reading a Renal duplex compare renal size. $>2\text{cm}$ difference is suggestive of renal artery ischemia.



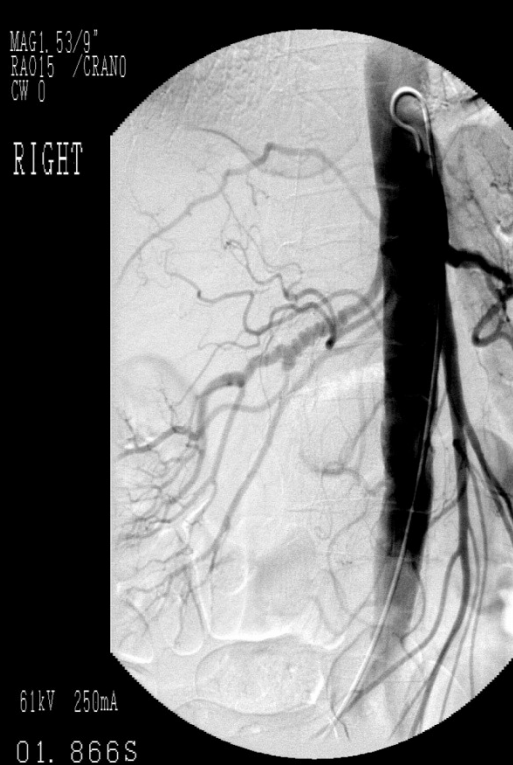
FMD and Renal Duplex

FMD

FMD



Angiography and FMD



F0015

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E:02 /G: SUB
W:0320/C: 0000

Renal Stenosis



Renal Treatment Options

Angioplasty and stenting

- Alone or in combination with stent implantation, PTRAs are increasingly used as an alternative to surgical revascularization for the treatment of renal artery stenosis (RAS), which may cause HTN or jeopardize renal function. Technical success is usually achieved in more than 85% of cases; the failure rate is 10%.
- Surgery is the last option**** Along with Dialysis and Transplants.



Closing Suggestions

- Patients with MAS or CA Stenosis are at a elevated risk of Renal Artery Stenosis. Therefore, if the patient has a history of unexplained hypertension a Renal Duplex or Renal testing should be considered.
- MALS is more prevalent in younger women than men. If unexplained abdominal pain, weight loss, epigastric bruit are observed consider mesenteric duplex.
- Refer you local cardiovascular interventionalist



Questions ?

