



## Current Applications for CEUS in the Vascular Lab

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## Disclosures

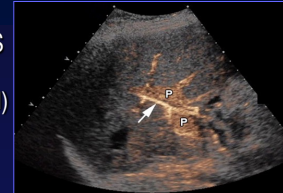
- Educational consultant for Philips Healthcare
- We don't routinely perform CEUS in the vascular lab at Yale
- Many thanks to my friends for sharing their cases!

## #1: Can't Find a Vessel

- Is it thrombosed vs stenosed vs just can't see it (F+)
- Transplants
  - Exclude hepatic artery thrombosis
    - Nifedipine good alternative
  - Diagnose diffuse cortical necrosis in renal Tx

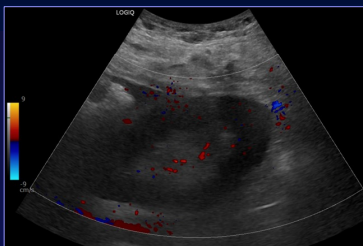
## Hepatic Artery: CEUS

- 72 pts both pre & post contrast study
- 8 w/ no flow on CDUS
  - 6 w/ proven flow on CEUS (Optison 0.5ml)
  - 5/6 confirmed w/ angio, one with normal f/u US



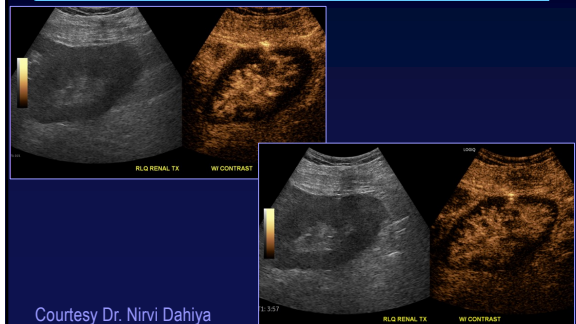
Courtesy Dr. Deborah Rubens

## Renal Failure s/p Renal Tx



Courtesy Dr. Nirvi Dahiya

## Diffuse Cortical Necrosis



Courtesy Dr. Nirvi Dahiya

## #2: Carotid CEUS

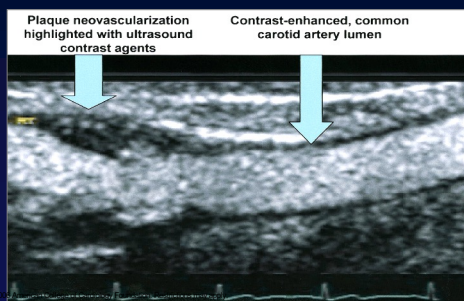
- Improved visualization of the residual lumen
  - ↑ sensitivity for detection of ulceration
  - Direct visualization of and grading stenosis
  - So, why not all the time?
- Improved sens & spec for detection of vulnerable plaque
  - Hemorrhage, vascularity, inflammation
  - Is this real or a valid consideration?

## Unenhanced (A) & Early CEUS (B) of the Carotid Artery



Feinstein et al, J Am Coll Cardiol 2006; 48: 236-243

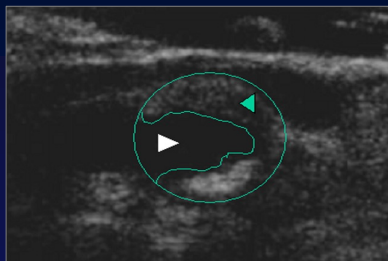
Feinstein et al, J Am Coll Cardiol 2006; 48: 236-243



Feinstein et al, J Am Coll Cardiol 2006; 48: 236-243



## Non-CEUS Image: Carotid Lumen (white arrowhead), Carotid Plaque (green arrowhead)



Owen DR et al, Radiology 2010; 255: 638-644

## Late-phase CEUS image



Owen DR et al, Radiology 2010; 255: 638-644

### #3: Endoleaks

- Cheaper & less risk than CTA
- May be more sensitive than CTA
- Should we be using it routinely?
  - May just find a lot of clinically irrelevant Type II endoleaks that don't need intervention

### #3: Endoleaks

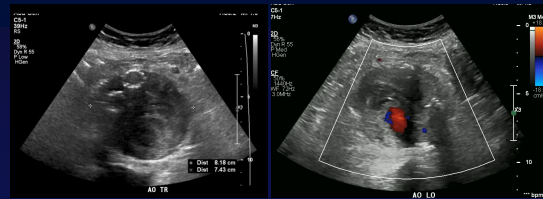
- Definitely useful for
  - Pts with renal failure or iodinated contrast allergy
  - Problem solving
    - Differentiate Type I & III from Type II endoleaks
    - Aneurysm is increasing in diameter, but don't see endoleak on CD US

### 79 y/o Female w/ Increasing AAA size



Courtesy Dr. Michelle Robbin

### Lucent Areas Concerning for Endoleak



Courtesy Dr. Michelle Robbin

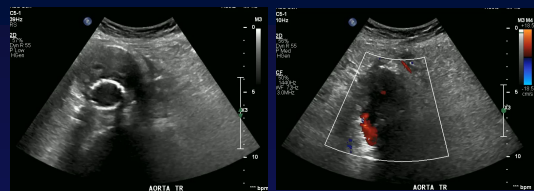
### 79 y/o Female w/ Increasing AAA size



Type II Endoleak

Courtesy Dr. Michelle Robbin

### 79 y/o Female w/ Enlarging AAA



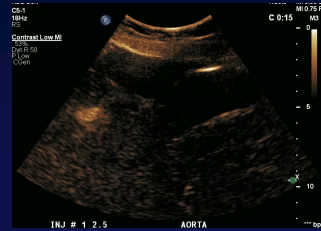
Courtesy Dr. Michelle Robbin

## AAA s/p EVAR



Courtesy Dr. Michelle Robbin

## Immediate Contrast Seen at Top of Stent



### Type I Endoleak

Courtesy Dr. Michelle Robbin

## AAA s/p EVAR: 34 sec s/p CEUS



Courtesy Dr. Michelle Robbin

## Tips & Tricks

- Baseline NCE CT helpful
- Endoleaks often anechoic on GS
- NPO 6-8 hours
- Scan TRV top to bottom, several times
- LLD and RLD positions may be helpful
- PATIENCE!
  - May need to watch for 5-10 minutes
- May need second injection

## Tips & Tricks

- Immediate enhancement = Type I or III
- Late enhancement (>1 minute) = Type II