

Renal Artery Intervention: *Top Five No-Nonsense Tips and Tricks for Successful Renal Artery Stenting*

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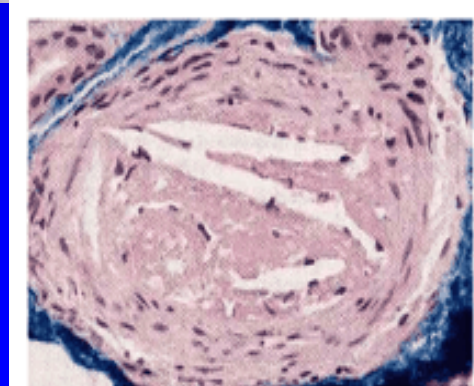
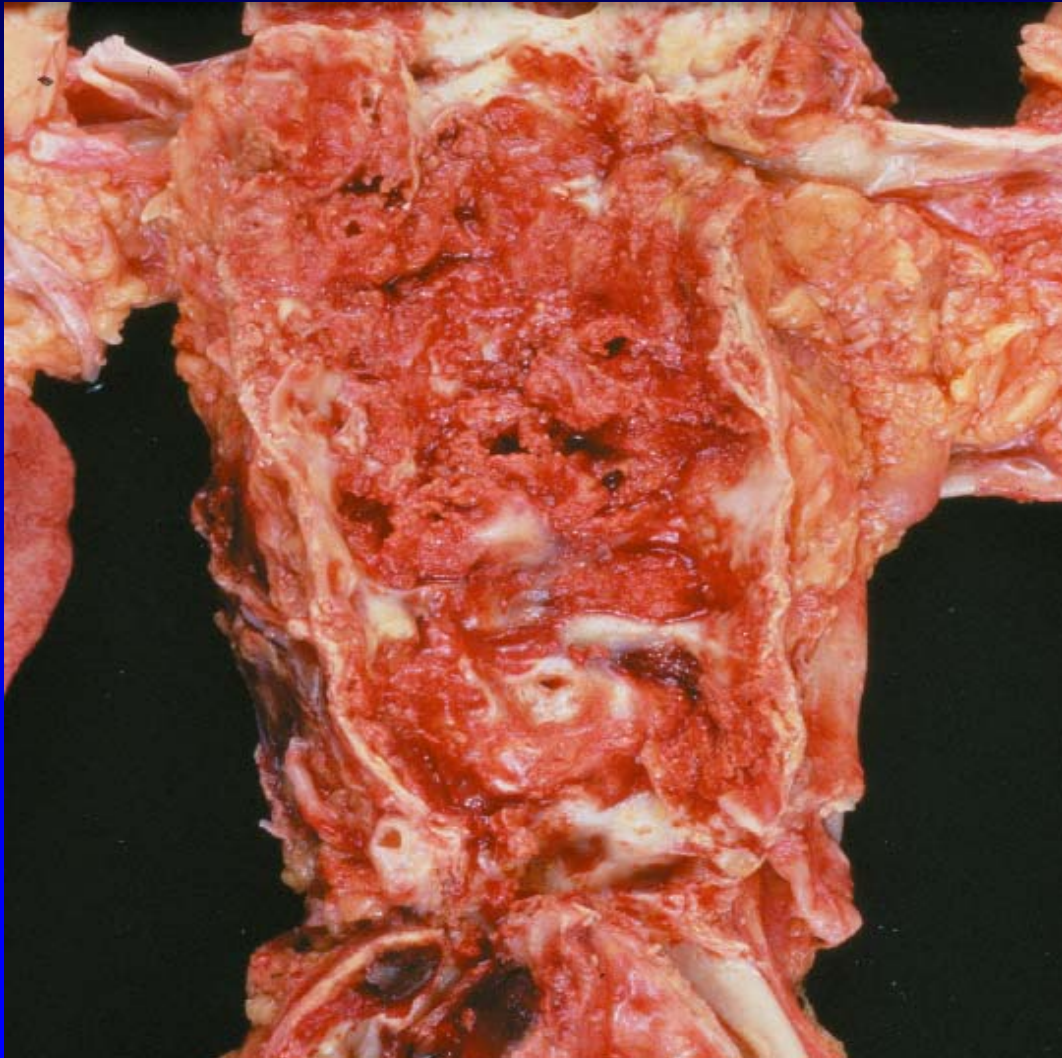
Medical Director of the Vascular Center

UC Davis Medical Center

No-Nonsense Tip #1

Don't Hurt that Kidney. Do
Everything You Can to Safely
Engage the Renal Artery!

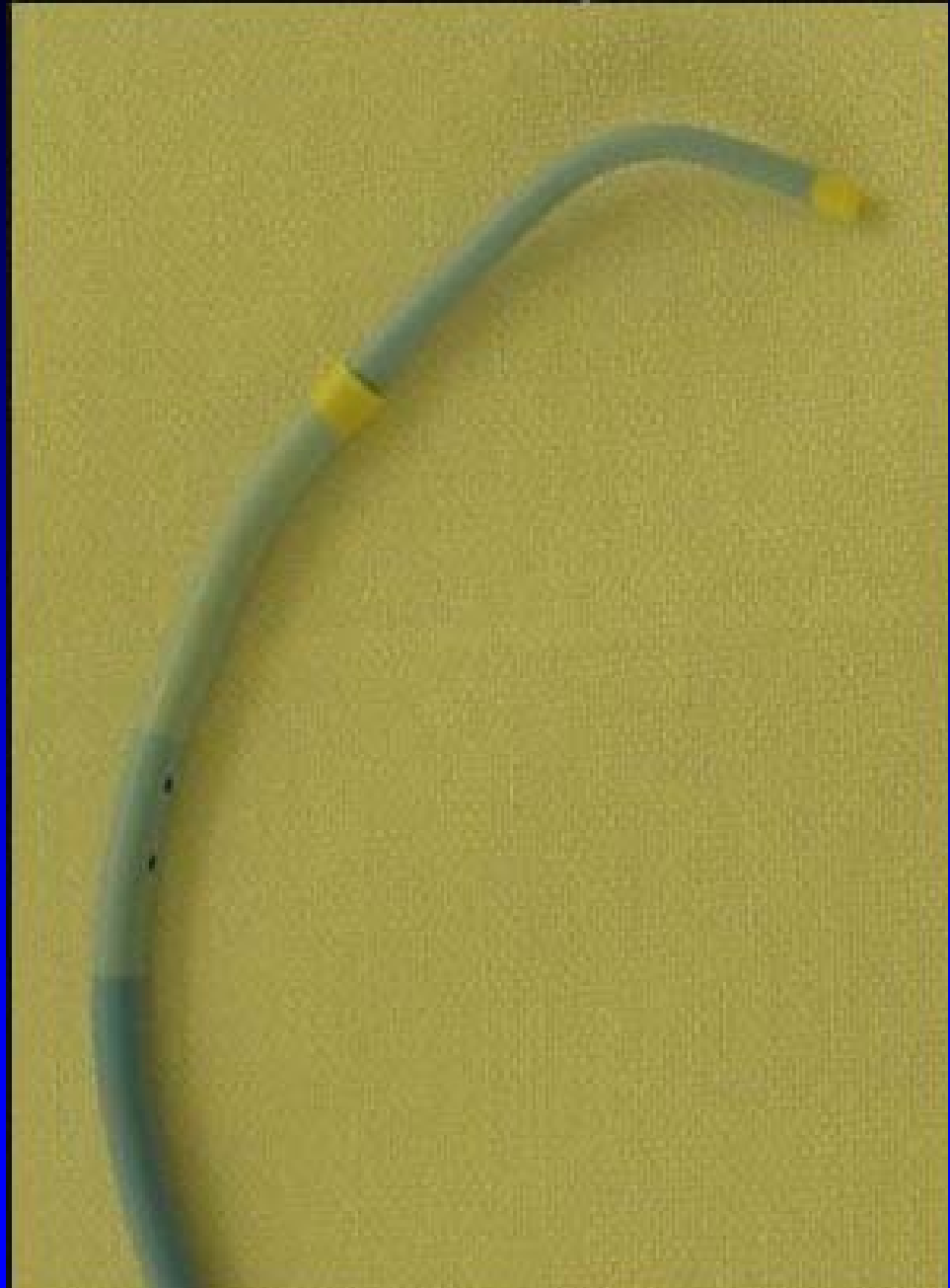
Atheroembolism during PTR

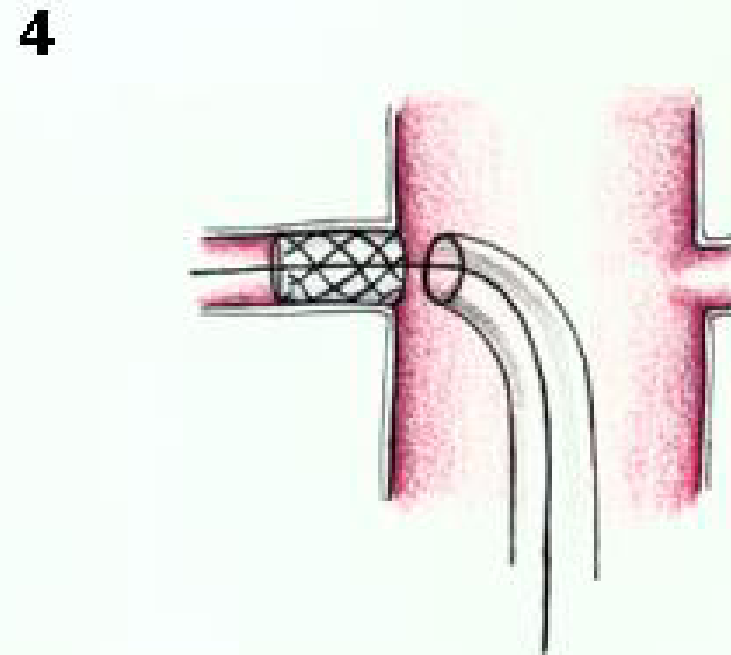
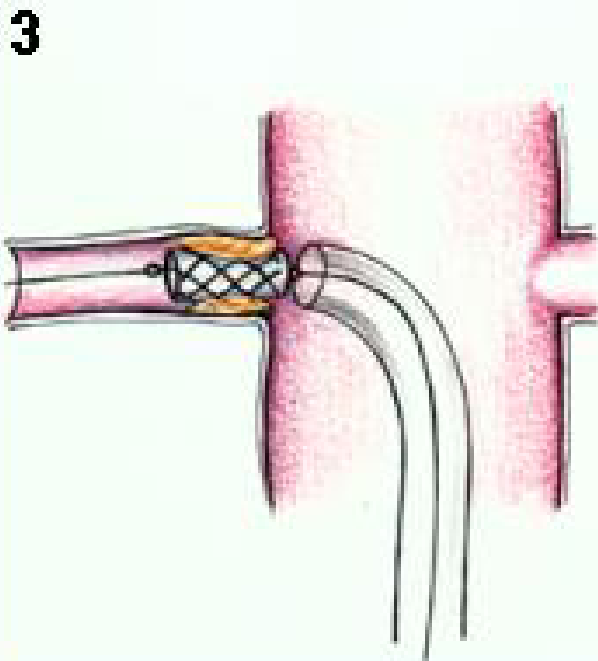
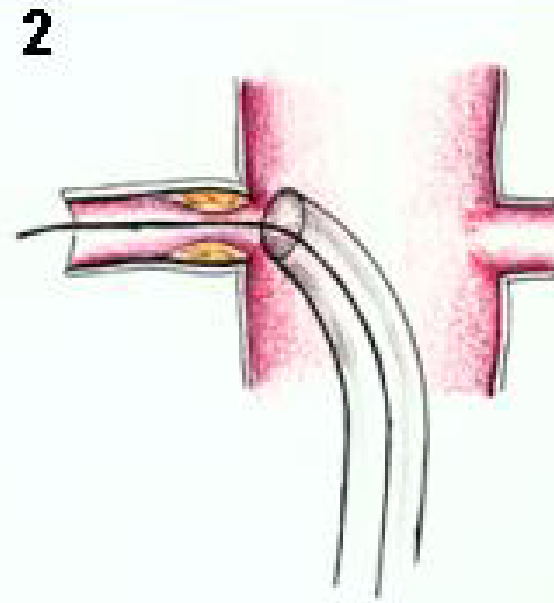
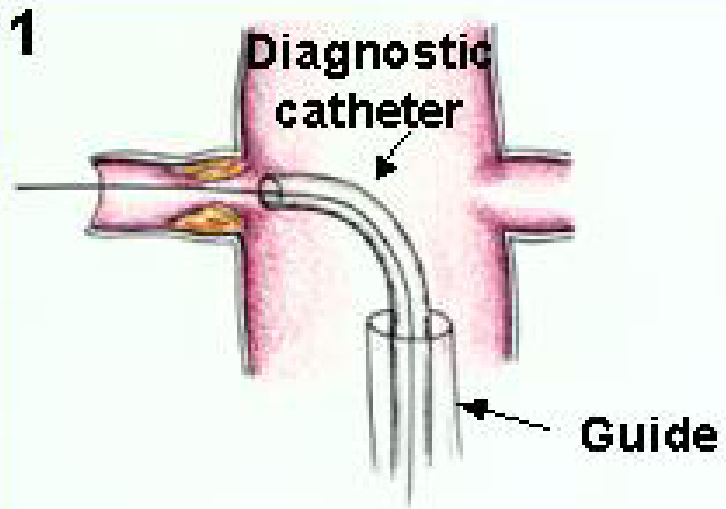


Optimal Technique

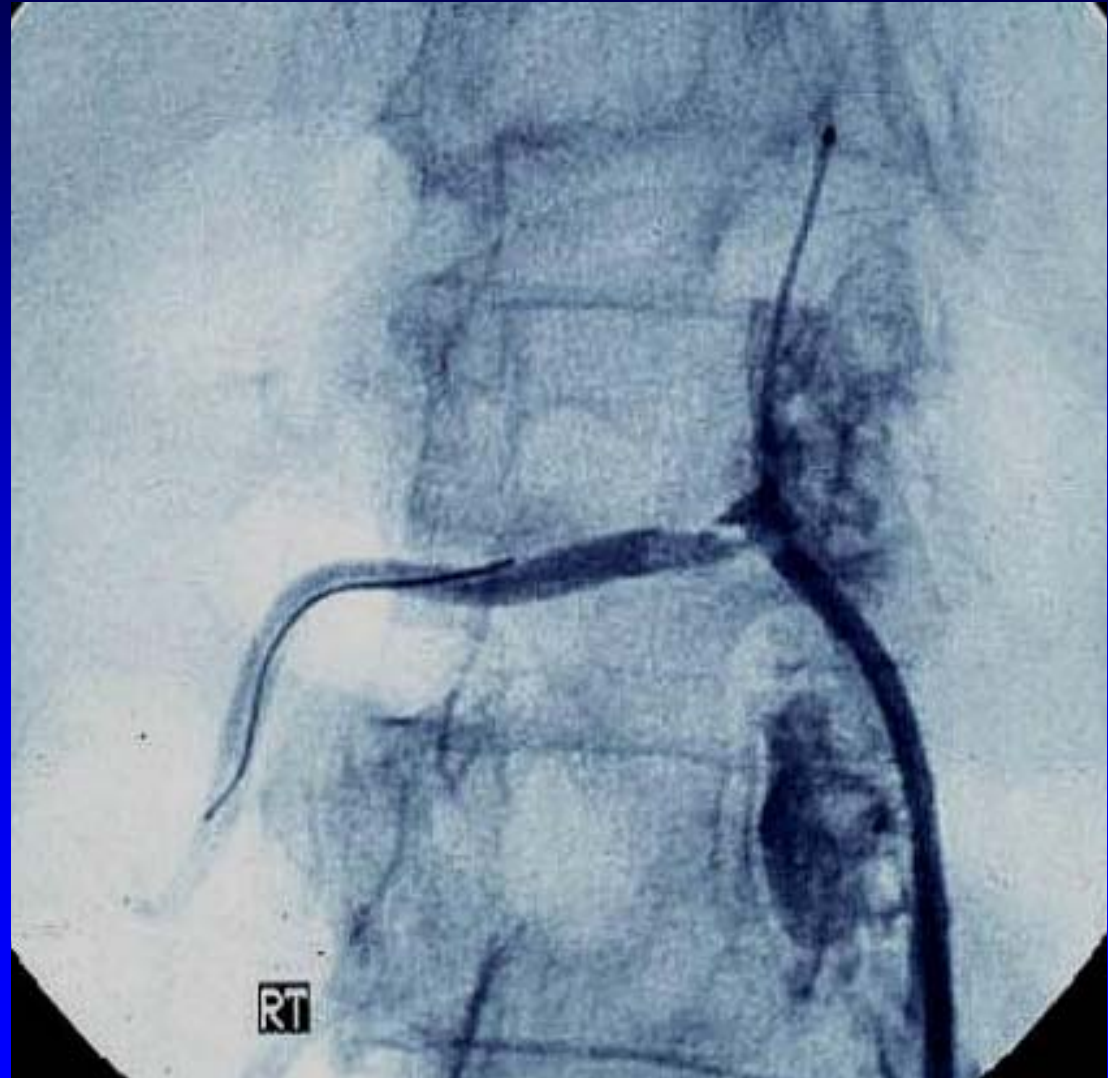
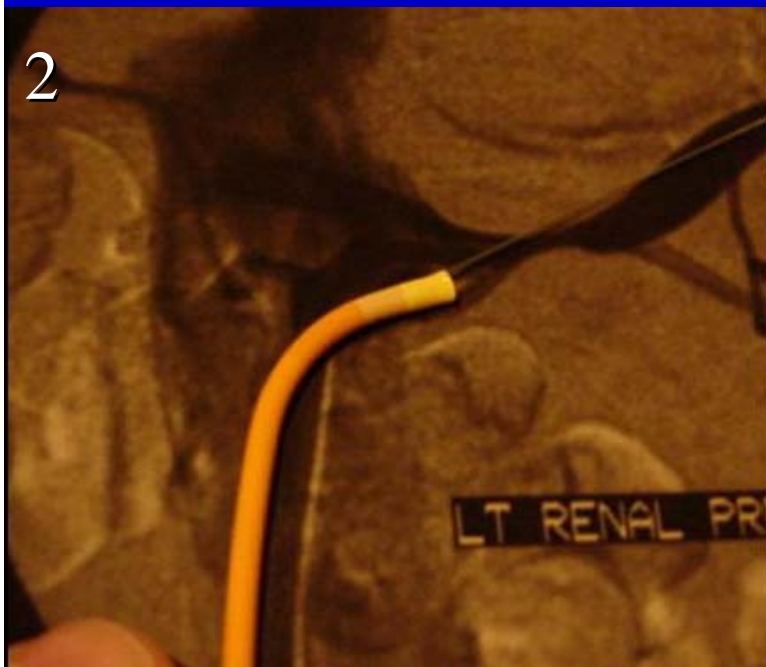
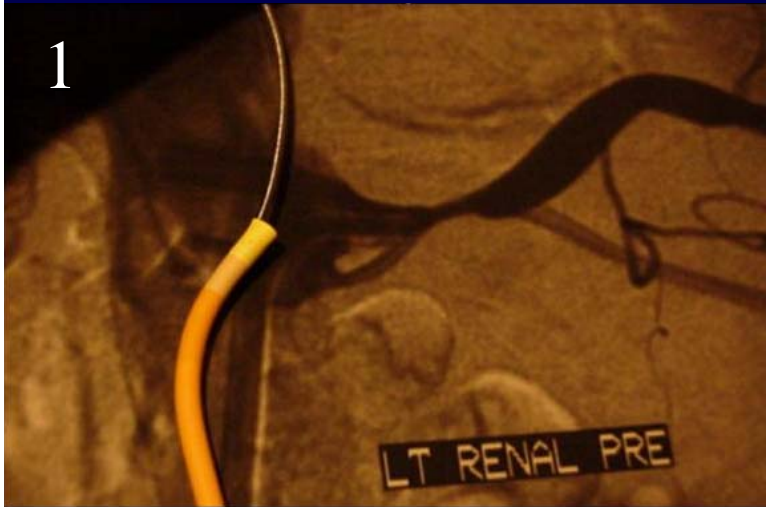
Severe atherosclerotic disease of abdominal aorta

- Minimize catheter manipulation in the aorta
 - Engage renal artery with softer diagnostic catheter (telescoped inside guide catheter)
 - “No touch” technique
- Consider brachial artery approach for heavily diseased abdominal aorta or extreme downward take-off of renal artery
- Consider embolic protection for high risk cases with appropriate anatomy





“No Touch” Technique



No-Nonsense Tip #2

Don't Hurt that Kidney. Do
Everything You Can to
Reduce the Risk of Contrast
Induced Nephropathy!

Optimal Technique

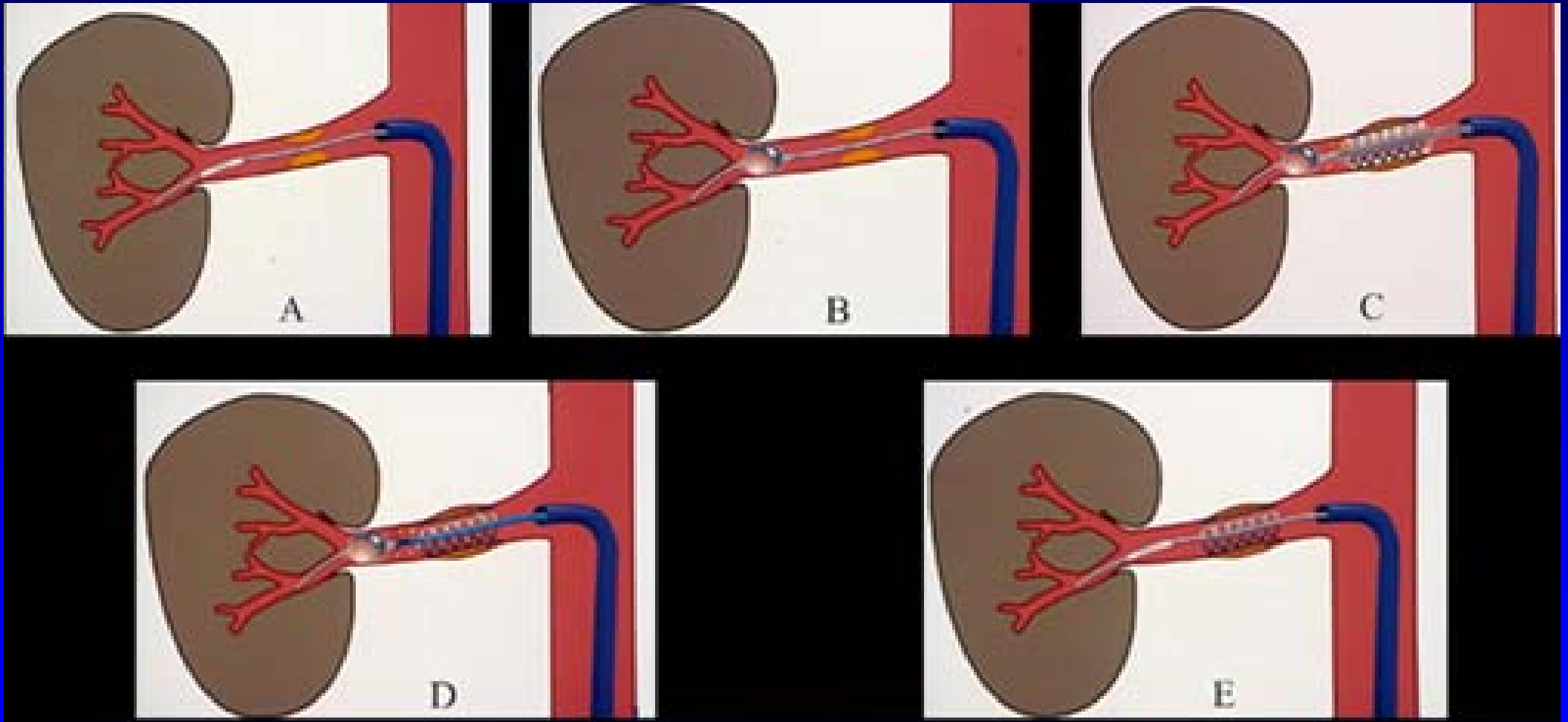
Severe Baseline Renal Insufficiency

- Pretreatment for contrast nephropathy:
 - Hydration
 - Mucomist
 - Sodium Bicarbonate
- Minimize contrast use:
 - DSA
 - Low or iso-osmolar contrast
 - Strict discipline with injections
 - IVUS
- Distal protection?

No-Nonsense Tip #3

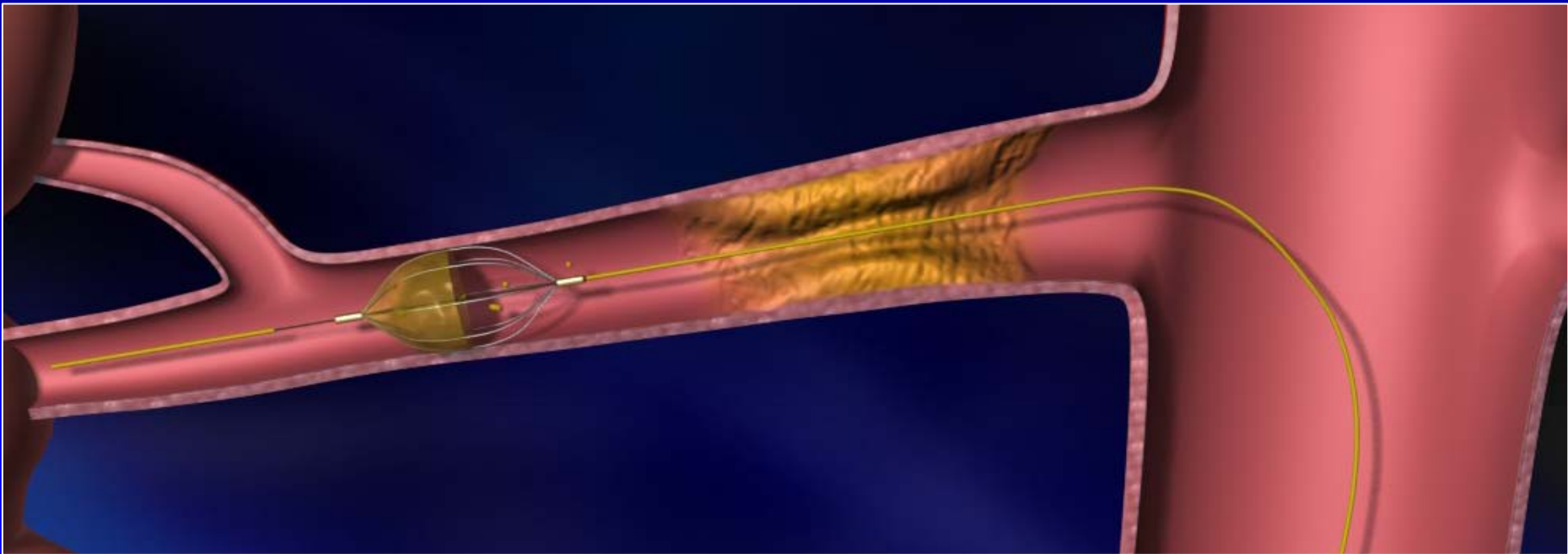
Don't Hurt that Kidney. Use
Embolic Protection in High
Risk Cases!

Optimal Renal EPD?



Distal Filtration

- Enables maintenance of flow throughout the procedure
- May allow small but important particles through



Renal Artery Stenting with EP in Patients with Ischemic Nephropathy

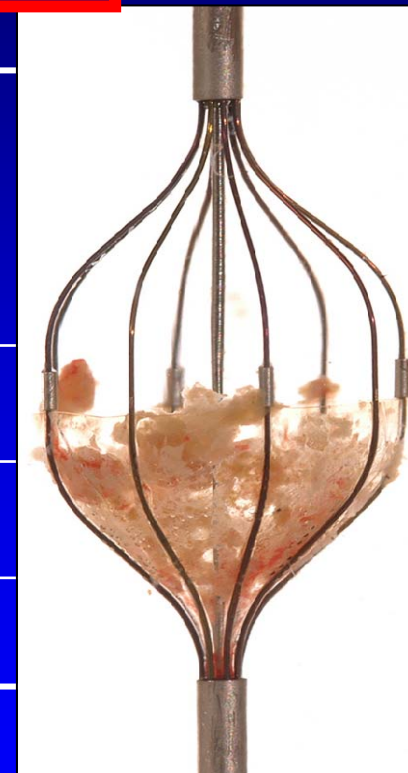
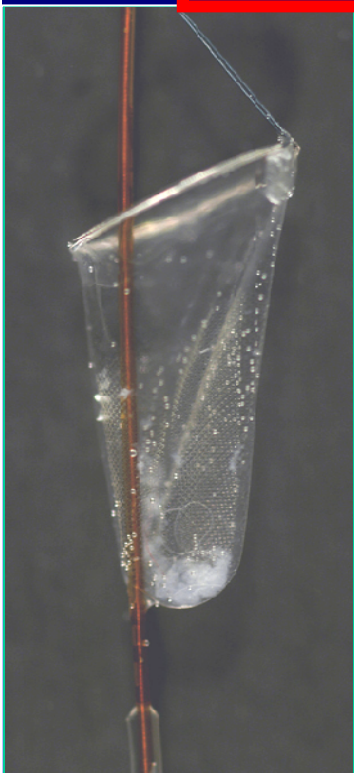
- 83 arteries treated in 63 consecutive patients from May 2002 to February 2005
- All patients had baseline CRI with a documented decline in renal function over the preceding 6 months
- CE-MRA used in the work-up in all patients
- All patients had an identical “primary filter passage” technique and stenting
- All patients had a minimum 6 months follow up

Filter Contents

(in pts that did not deteriorate)

Macroscopic emboli present in 38/63 filters (60%)

| Filter contents | Improved | Stabilized or Unchanged Decline | Total (%) |
|-----------------|----------|---------------------------------|-----------|
| Positive | 20 | 18 | 38 (60%) |
| Negative | 5 | 20 | 25 (40%) |
| Total | 25 | 38 | 63 (100%) |



Even Patients with positive filter contents had significantly improved outcome ($p=0.01$)

Renal Artery Stenting with EP in Patients with Ischemic Nephropathy

Level of pre-intervention CRI

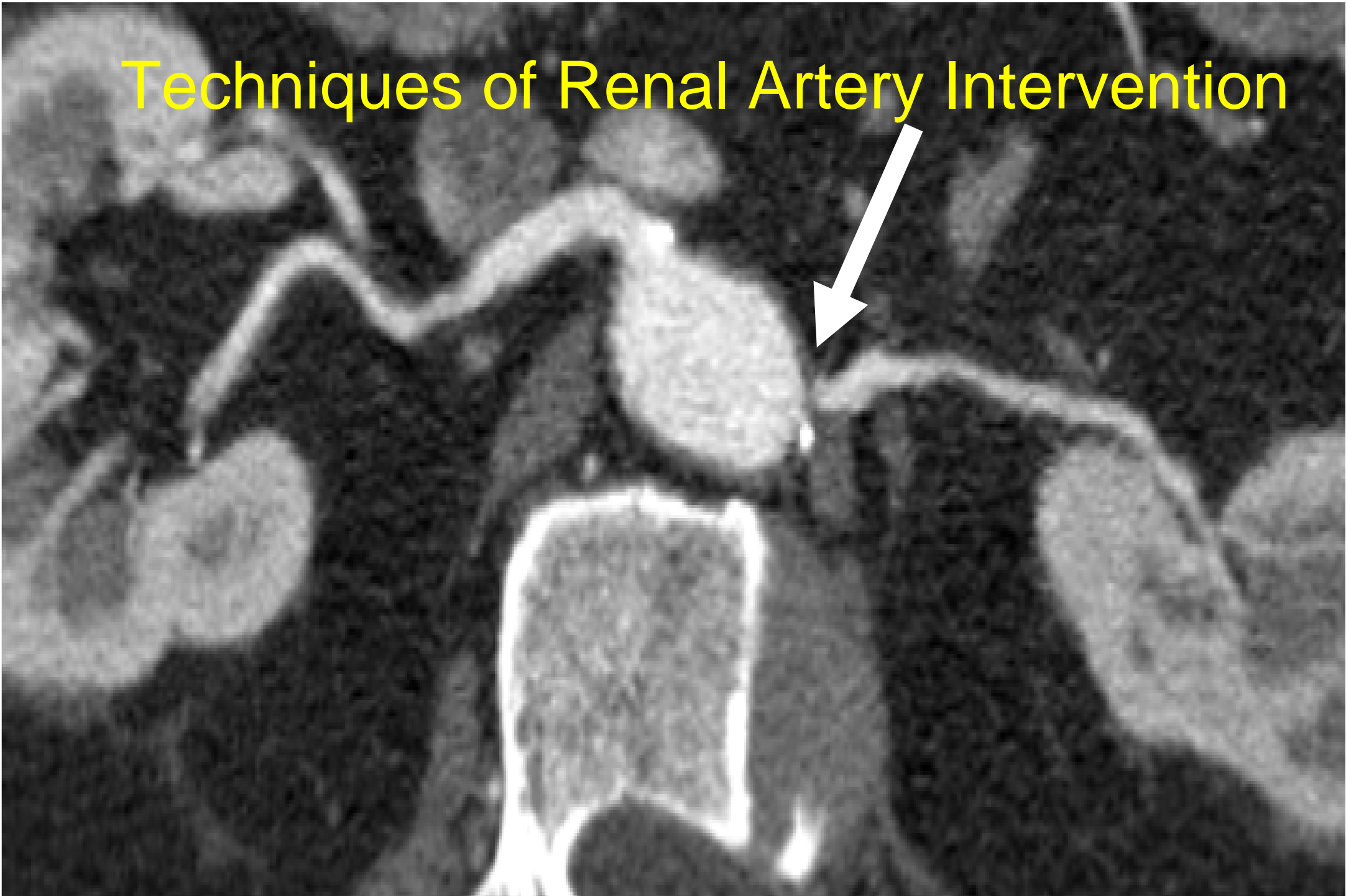
| | Mild | Moderate | Severe | Total |
|-------------------|---------|----------|---------|---------|
| Improved | 12(52%) | 8(32%) | 5(33%) | 25(40%) |
| Stabilized | 11(48%) | 15(60%) | 10(67%) | 36(57%) |
| Unchanged decline | 0(0%) | 2(8%) | 0(0%) | 2(3%) |
| Total | 23 | 25 | 15 | 63 |

97% of patients had improved or stabilized renal function at 6 months

No-Nonsense Tip #4

This is aorto-ostial disease.
Know where the ostium is!

Techniques of Renal Artery Intervention



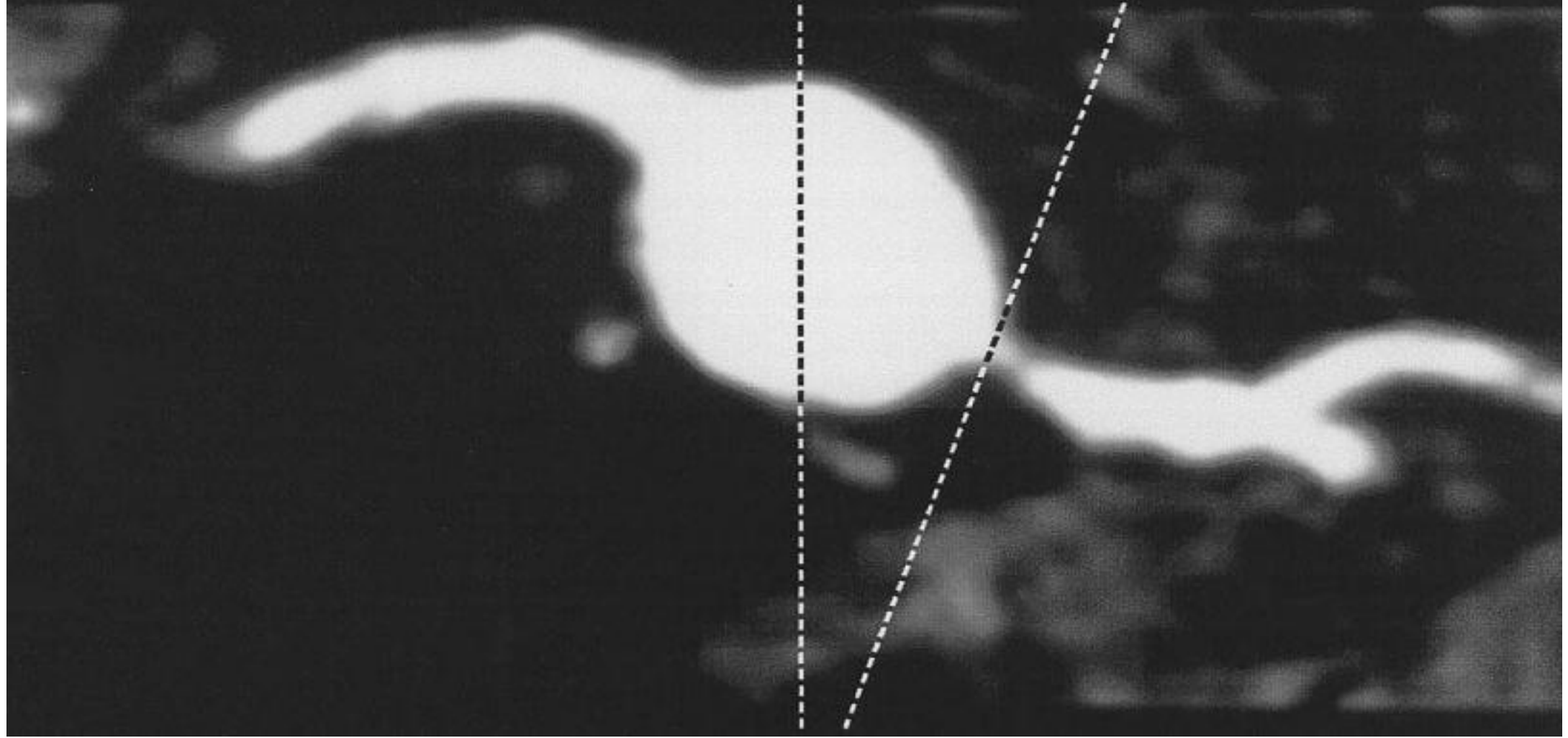
RIGHT

LEFT

Technique Pearl

0°

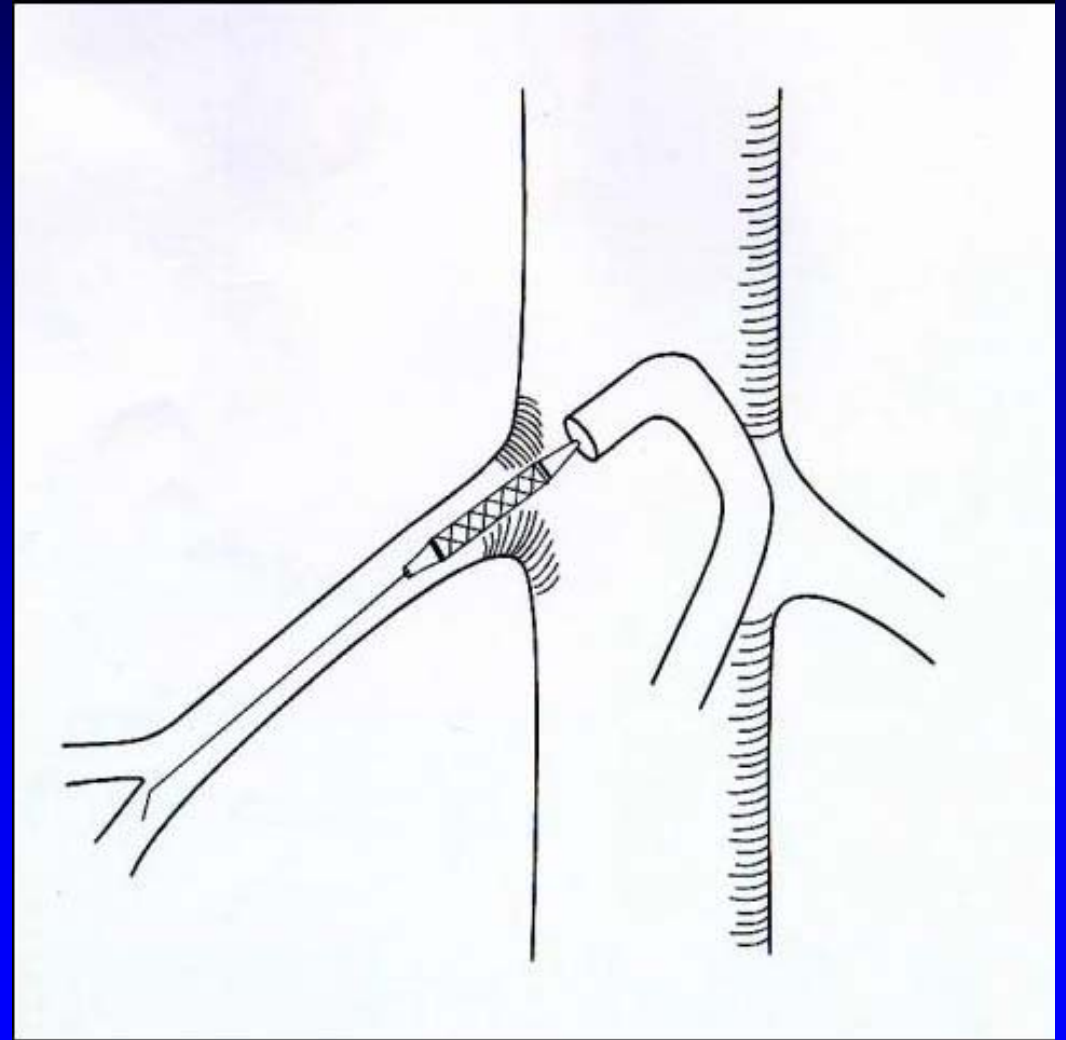
30°



Optimal Technique

Ostial Disease

- Identify the true ostium – angulated views
- Leave stent 1-2 mm into aorta
- Account for stent shortening
- Confirm complete ostial coverage



No-Nonsense Tip #5

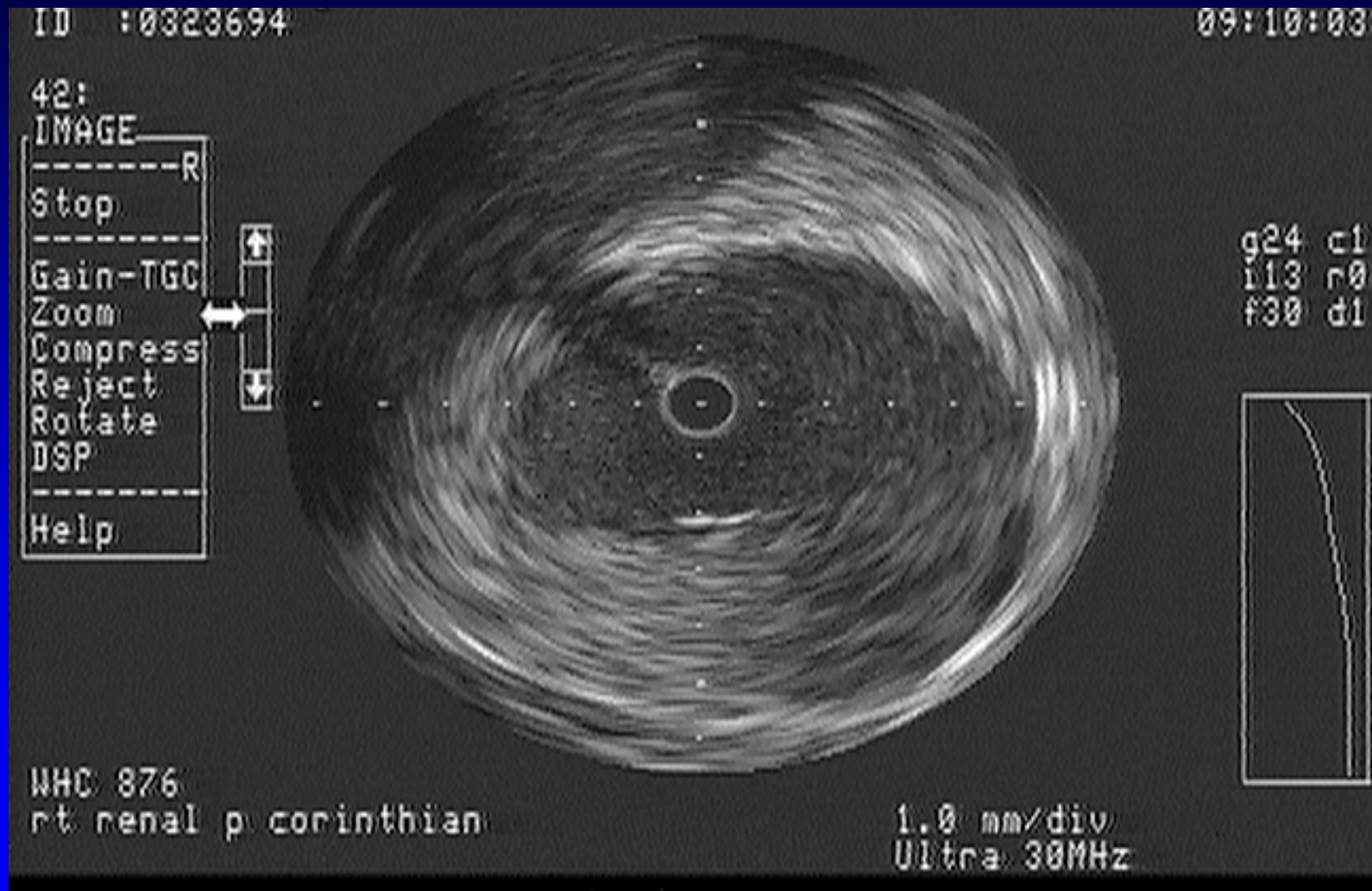
Use IVUS, Particularly if you
are Uncertain About the Final
Result

Renal Artery Intervention

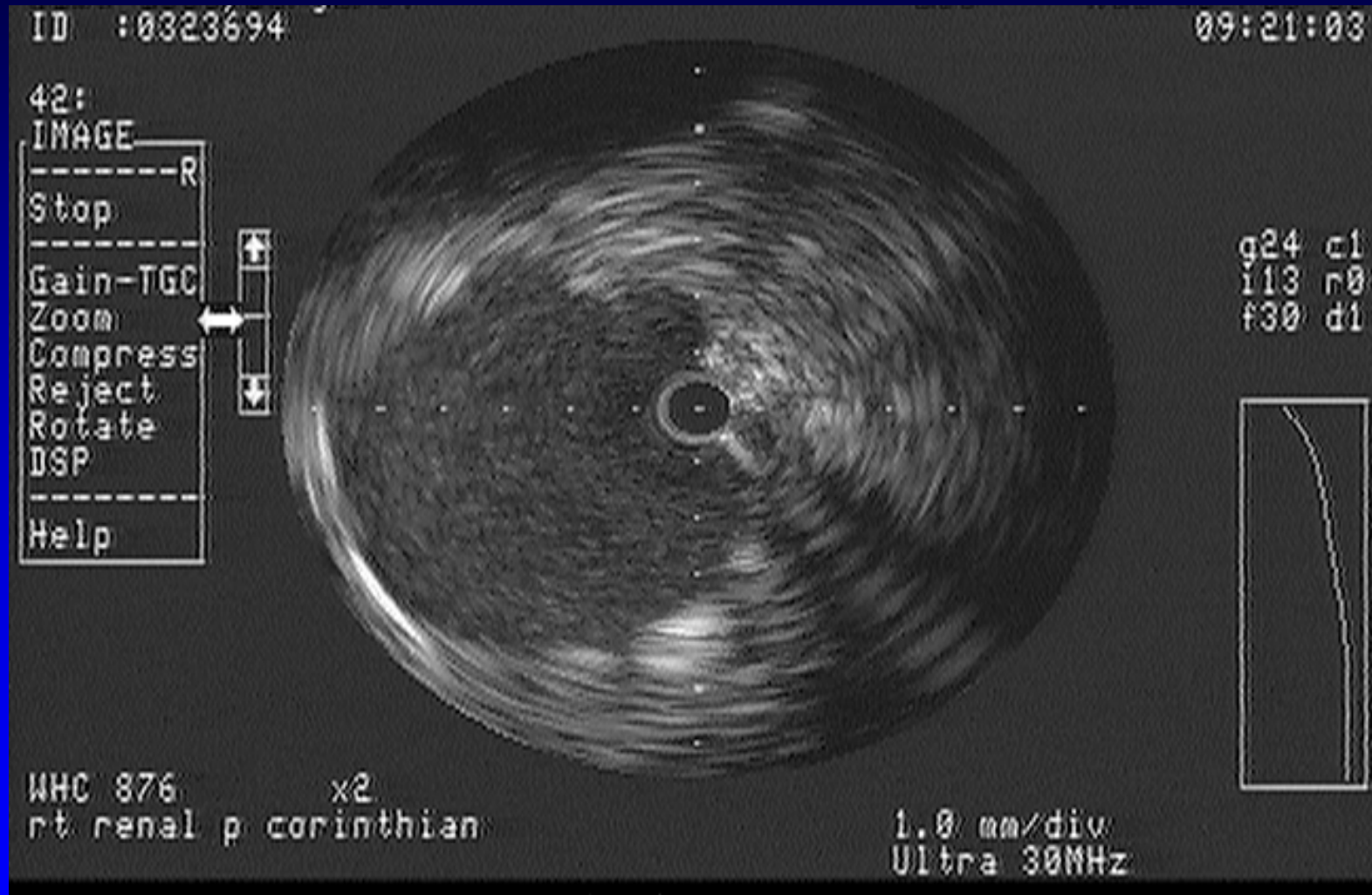
Potential Benefits of IVUS

- Precise vessel sizing
- Minimize contrast use
- Document full stent expansion and stent wire apposition
- Document complete ostial coverage with stent
- Accurate assessment of distal edge dissections

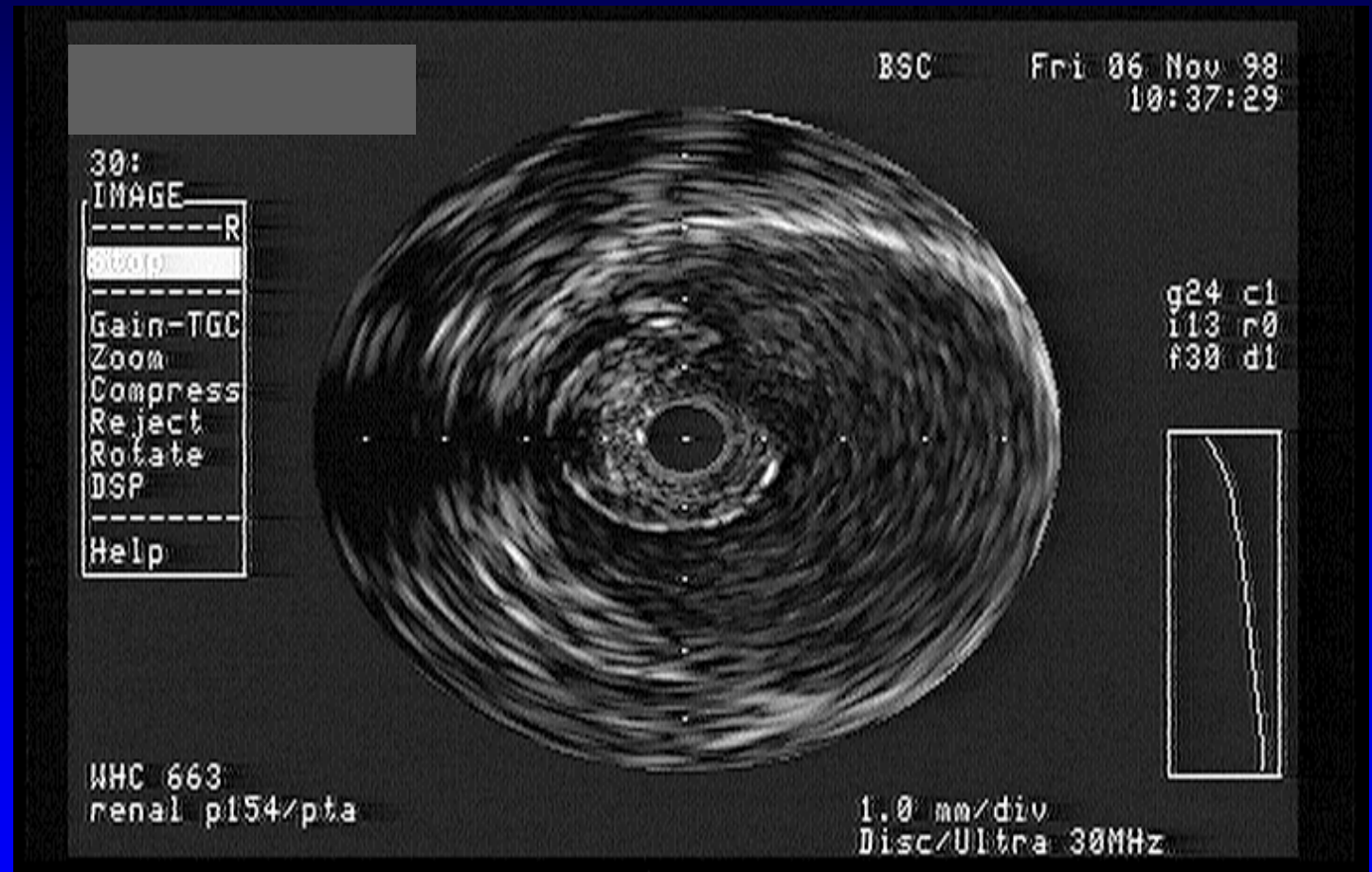
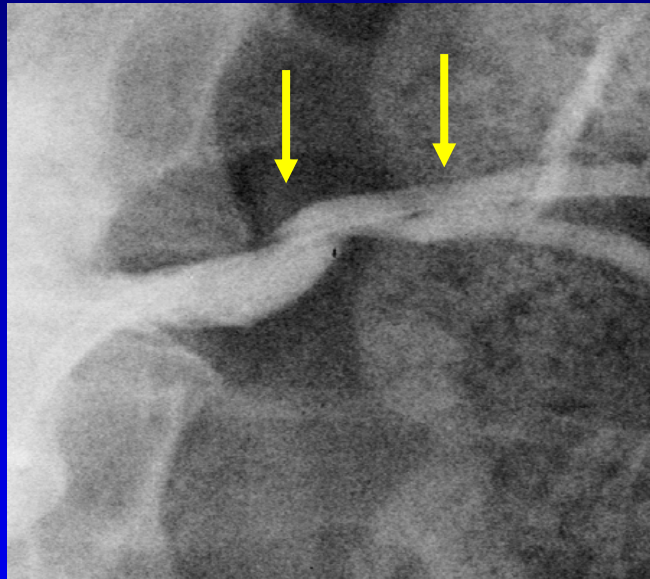
Intramural Hematoma Distal to Renal Stent



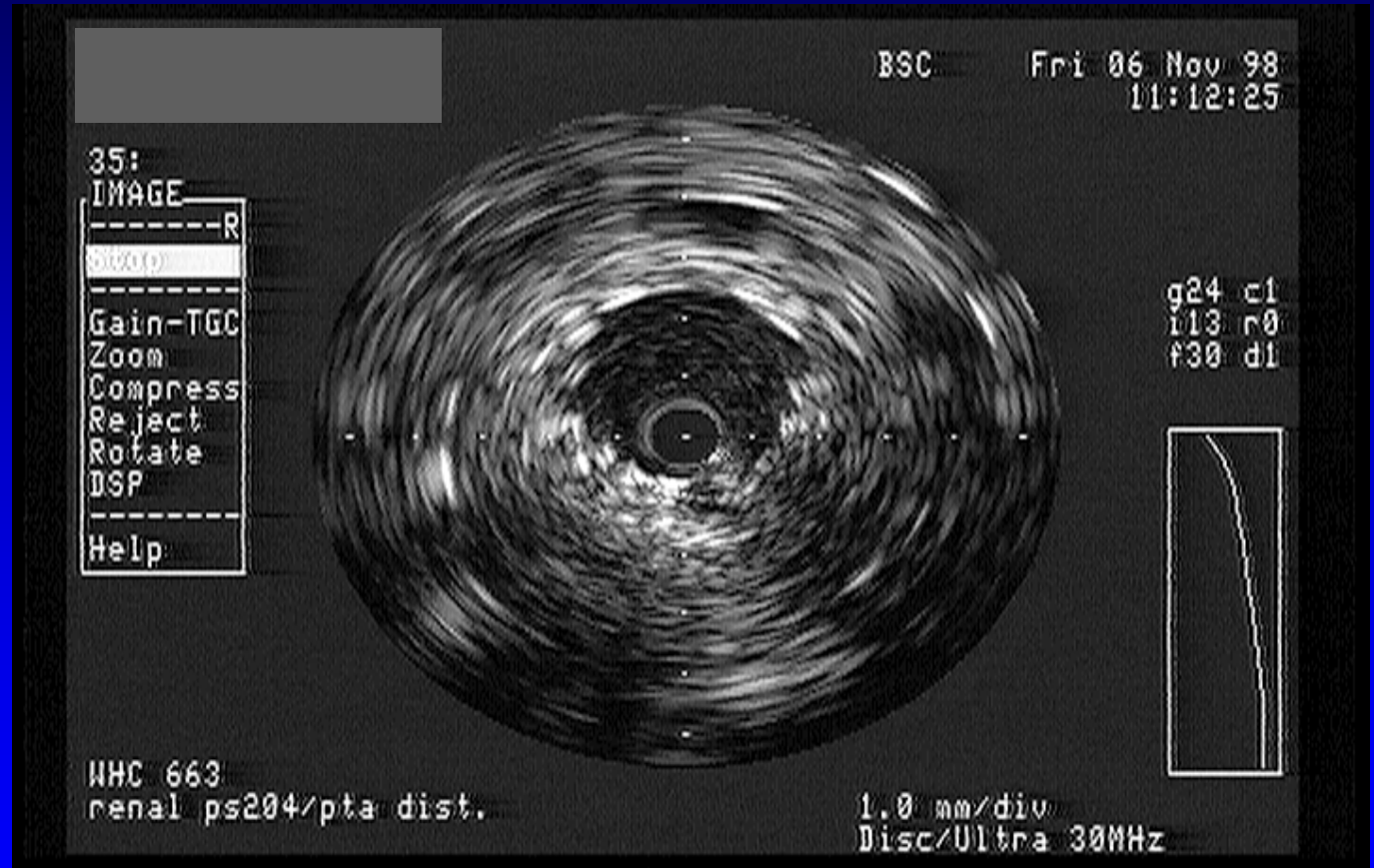
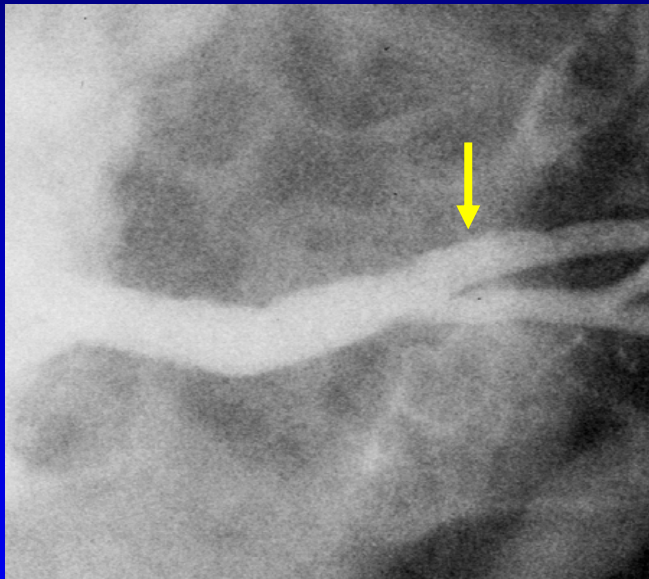
Following Treatment with Additional Stent



Severe Dissection Distal to Renal Stent



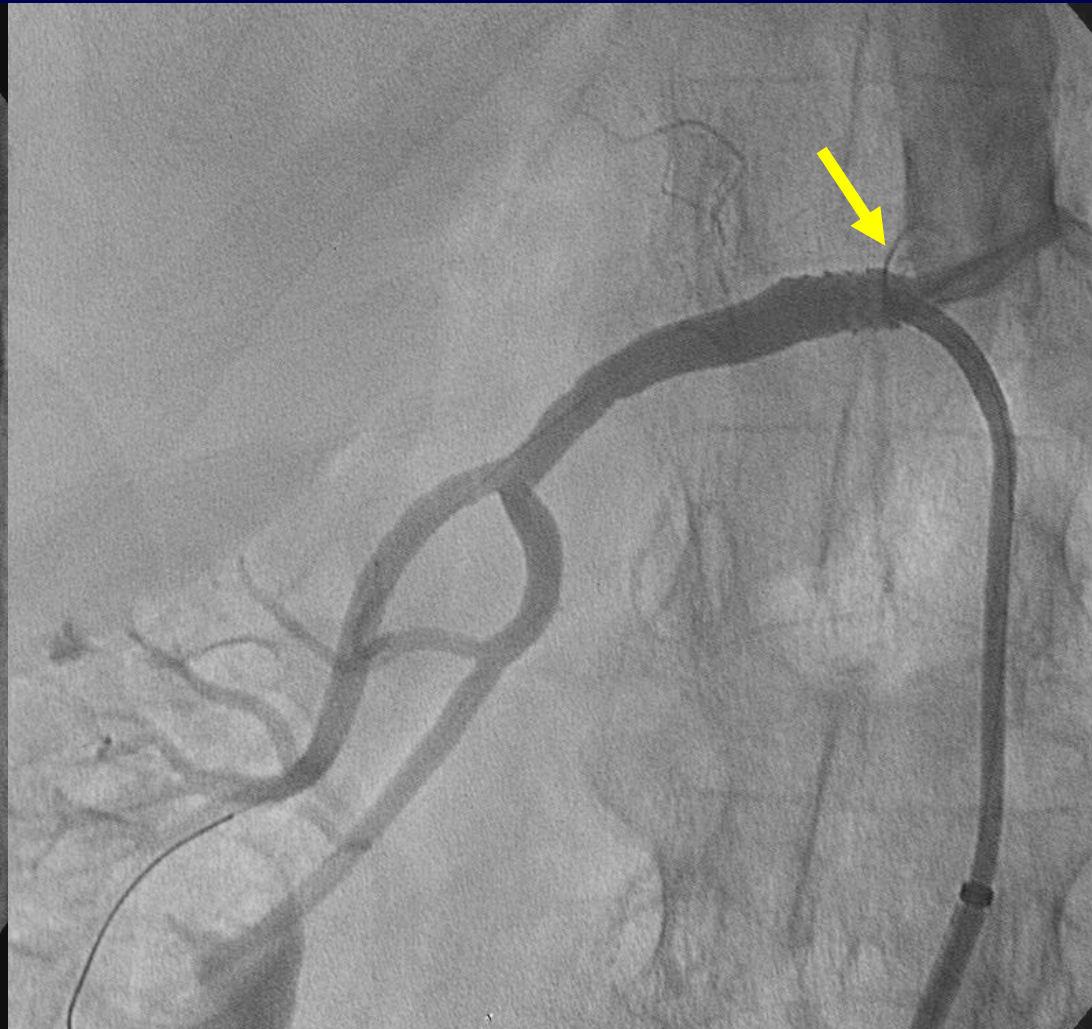
Severe Dissection Distal to Renal Stent



Documenting Ostial Coverage



Baseline



13 mm Stent

Results

153 Renal Arteries in 131 Patients

| | |
|---|-----------------------------|
| Procedural Success | 100% * |
| # of Stents | 1.10_±0.25 |
| # of balloons | 1.62_±0.73 |
| Need for further balloon use by IVUS | 24% |
| Need for additional stent by IVUS | 4.5% |
| Apposition/Expansion by final IVUS | 100% |
| Contrast use (ml) | 74_±18 |

*** No cases of acute or sub-acute stent thrombosis**

Conclusions

- The greatest risk of the procedure is atheroembolism to the kidney (or other organs) during catheter manipulation in the aorta or renal artery
 - Technique matters!
 - It's not the same as coronary artery intervention!