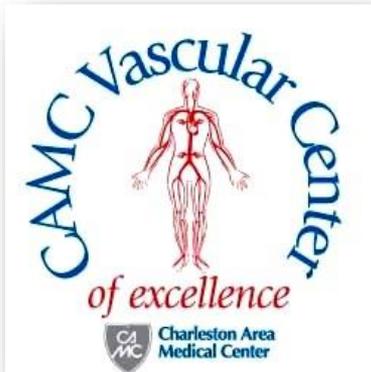


ISR and Complex Anatomy in Renal Stenting

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Disclosure Statement of Financial Interest

- **CeloNova BioSciences: Patents, shareholder and consultant**
- **Nexeon MedSystems: Founder, patents and shareholder**
- **WL Gore: Consultant**
- **Vascular Dynamics: Consultant**
- **Cook Medical: Patents**

Renal stent restenosis



Normal healing for a renal stent at 2 months (autopsy from patient who died from other causes)



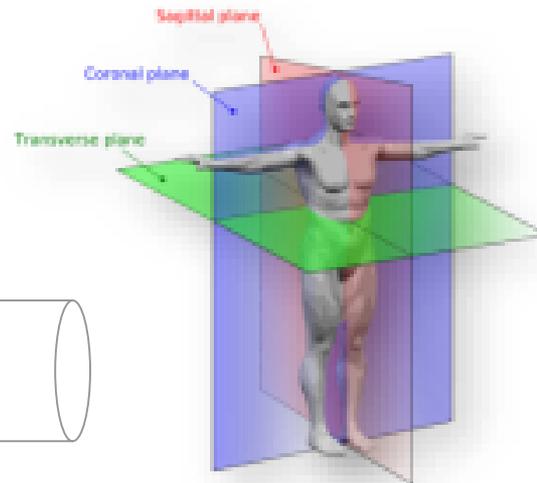
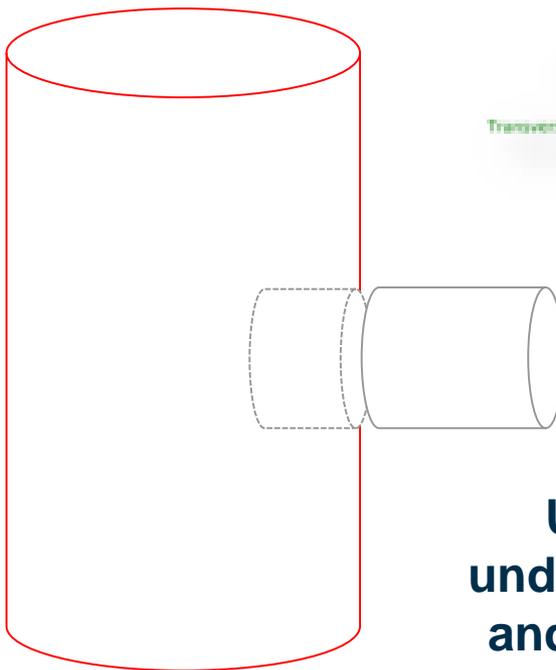
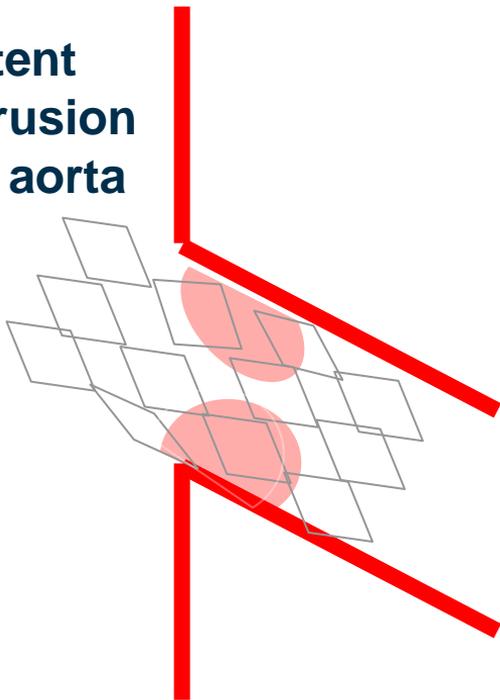
**Diffuse renal ISR
Higher risk in smaller vessels**

Relevant To Renal Stent Restenosis

- **Procedural Technique**
 - Access in patients with protrusion of stent into aorta
 - “Water seed” effect of balloon
- **Durability of second procedure**
 - When to use DES, covered stent, DEB,..

Challenge: Restenosis AND Geographic Miss

Stent protrusion into aorta

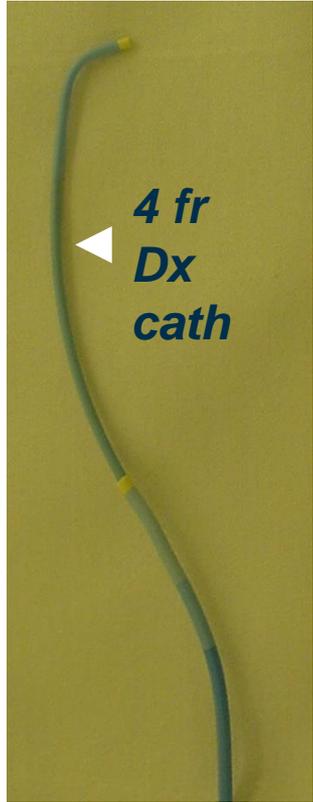


Usually due to poor understanding of anatomy and failure to use proper image obliquity at time of index stent

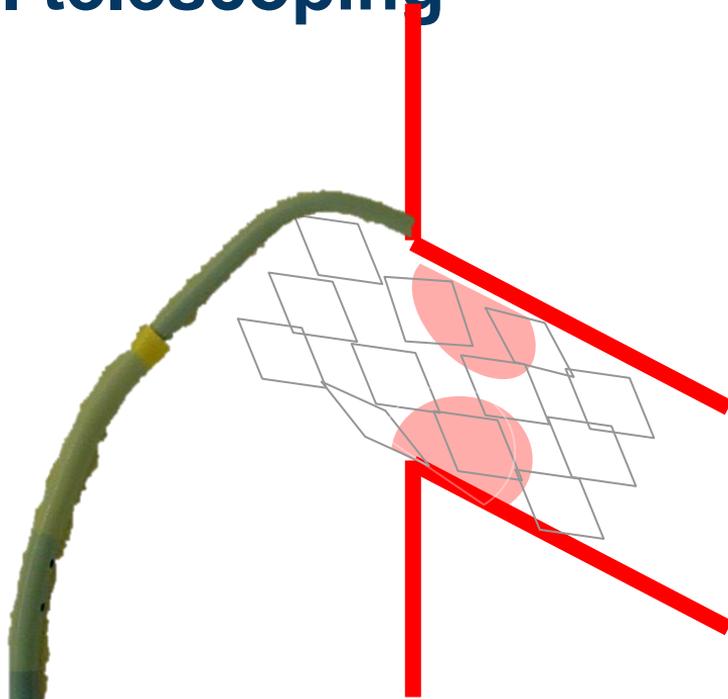
Use radial or femoral telescoping



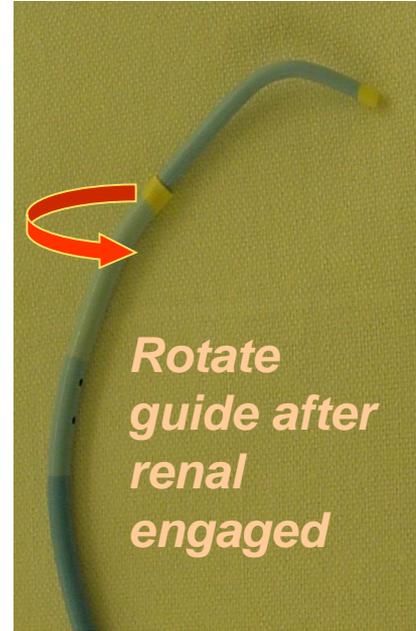
*No touch
guide or
sheath*



*4 fr
Dx
cath*



**Feel top of stent with
diagnostic then retract until
Dx catheter falls in stent**



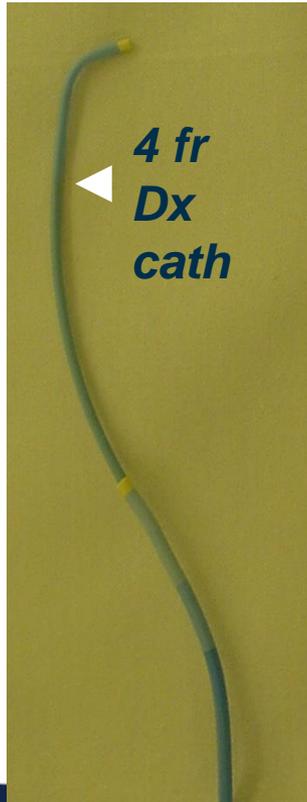
*Rotate
guide after
renal
engaged*

**Cross with .014”
wire and
advance guide
over DX**

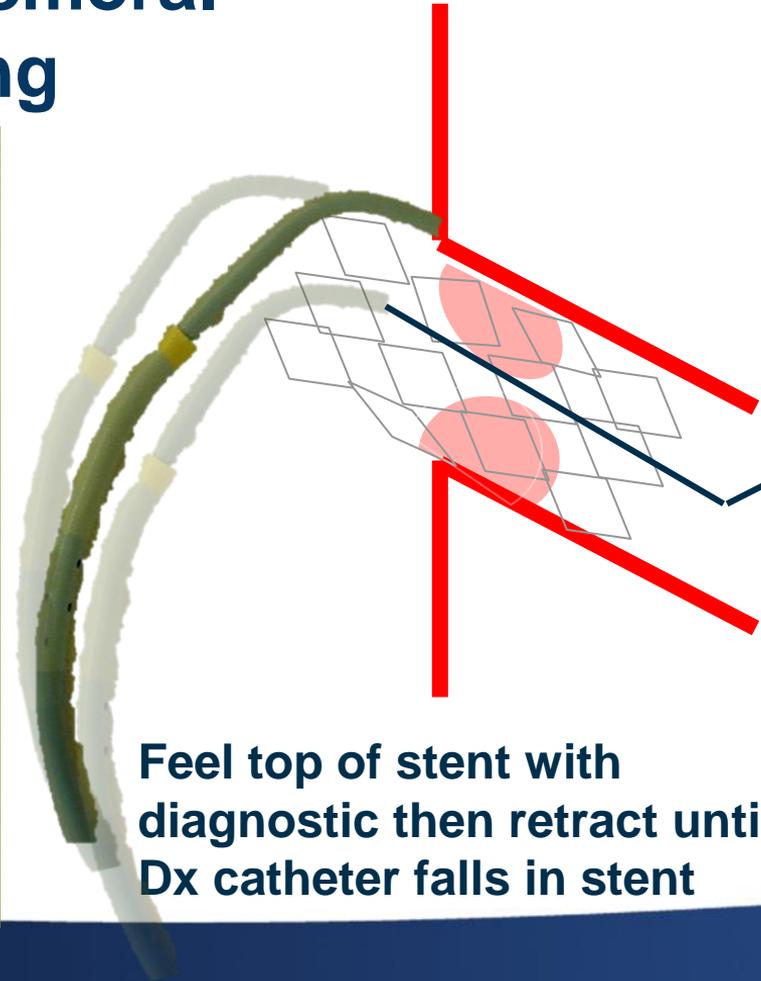
Use radial or femoral telescoping



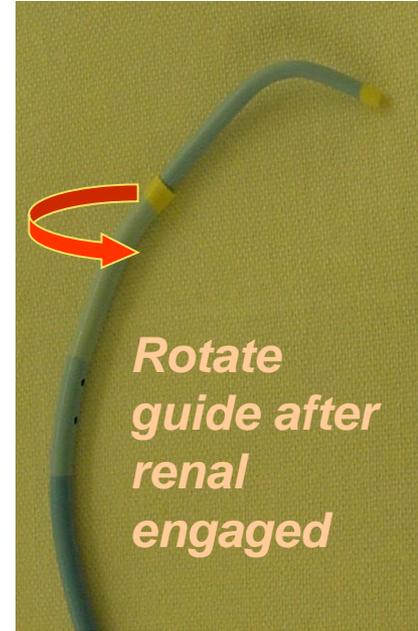
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cath*



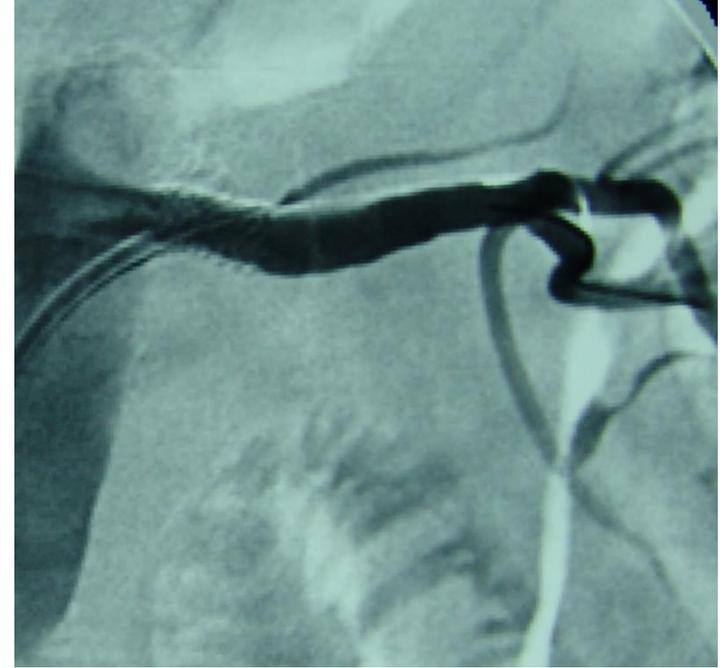
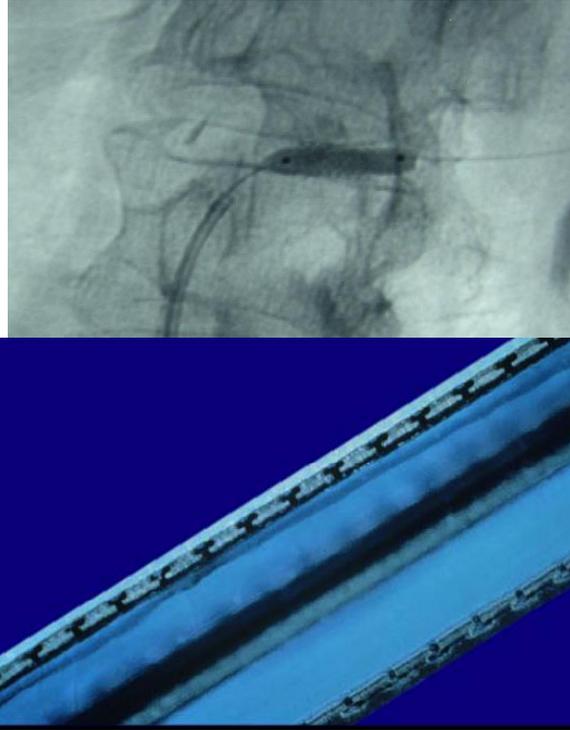
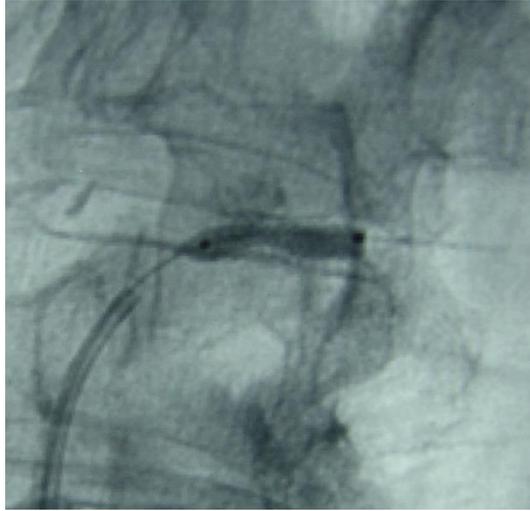
**Feel top of stent with
diagnostic then retract until
Dx catheter falls in stent**



*Rotate
guide after
renal
engaged*

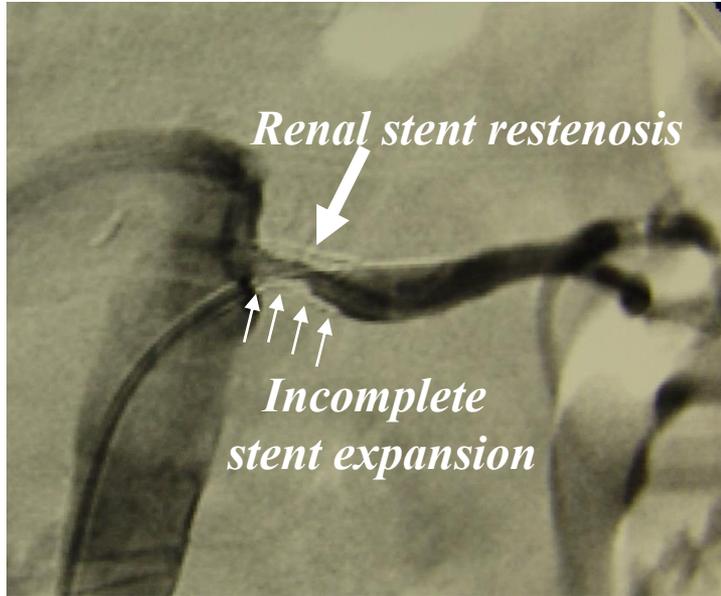
**Cross with .014''
wire and
advance guide
over DX**

Water Seed affect &/or Inability to dilate



Cutting Balloon (note: Does not reduce restenosis)

How to Improve Durability



In cases of initial inadequate stent expansion and vessel > 5.5mm consider IVUS and high pressure balloon, +/- second stent (Alternative is cutting balloon, angioplasty, shockwave,...). If lesion fully yields no further treatment

How to Improve Durability



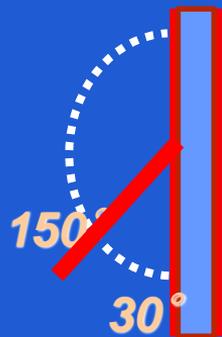
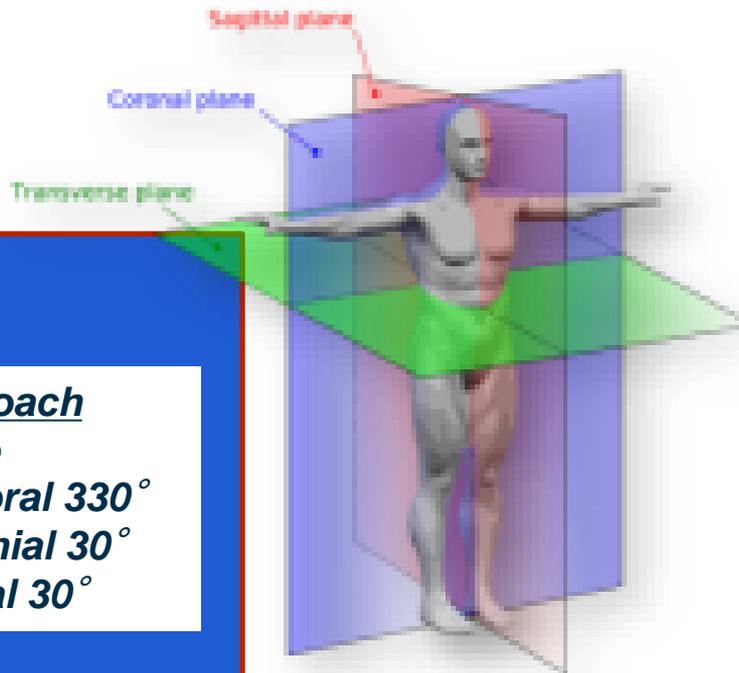
- **Diffuse ISR in vessel < 4.5 mm**
 - **Consider coronary DES**
- Kierman et al. Treatment of renal artery in-stent restenosis with sirolimus-eluting stents. *Vascular Medicine* 13 (1)
- *Bradic et al. DES superior to BMS in patients undergoing atherosclerotic renal artery stenosis. Eurointervention*

How to improve Durability

- **Good stent expansion and vessel > 5 mm. DEB versus covered stent.**
 - **Note: These options are OFF-Label and appropriate consent must be obtained before the procedure. New risks include:**
 - **Abrupt closure of covered stent**
 - **Excipient embolization from DEB in patients with poor reserve.**

Stone et al: Ten-year experience with renal artery in-stent stenosis J Vasc Surg 2011;53:1026-31.)

Complicated Cases



Approach

angle

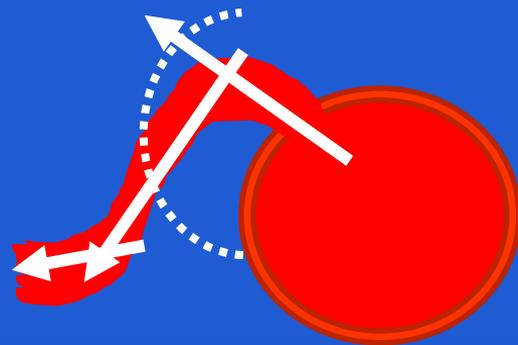
Femoral 330°

Brachial 30°

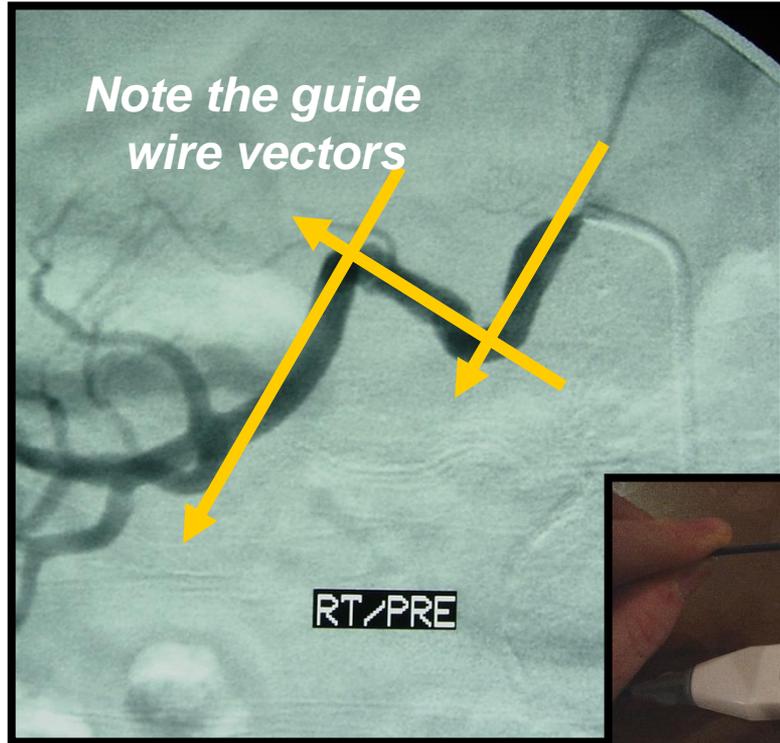
Radial 30°

Coronal vectors causes
guide to back out

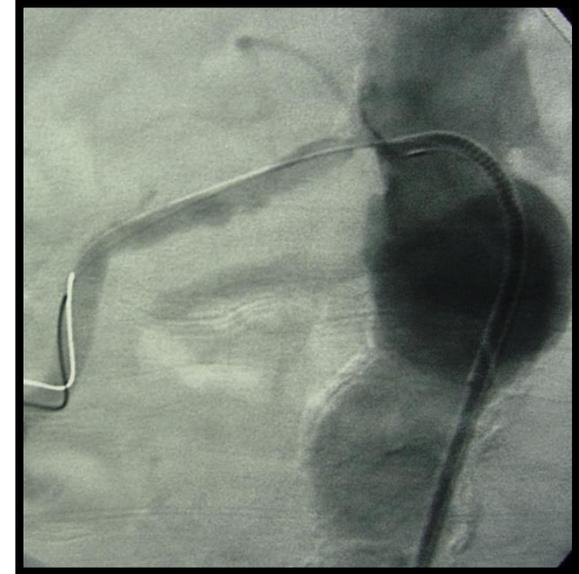
Transverse vectors
cause guide to rotate



Example of challenging trajectory



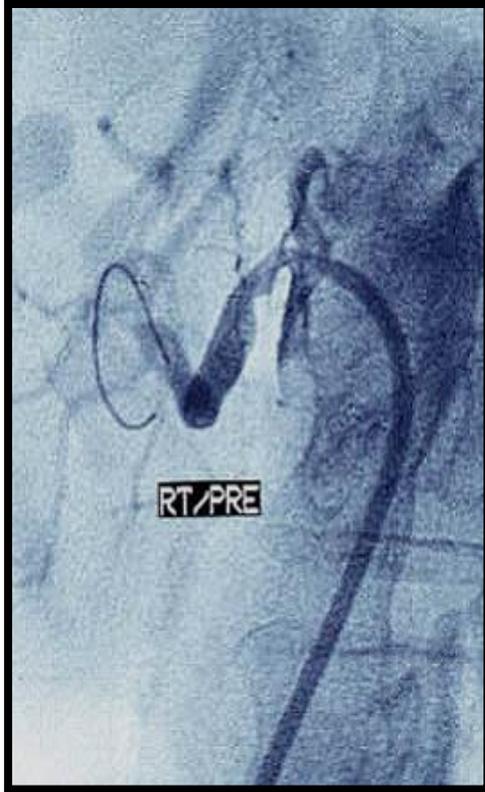
Once vessel released with a short transition wire (e.g. Spartacore)



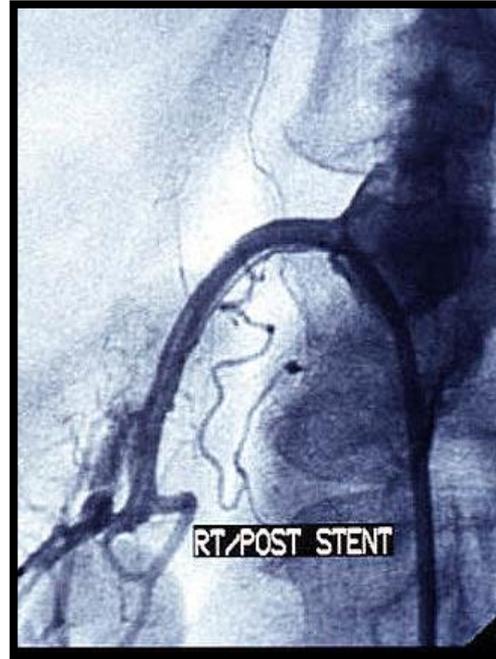
Active Guide



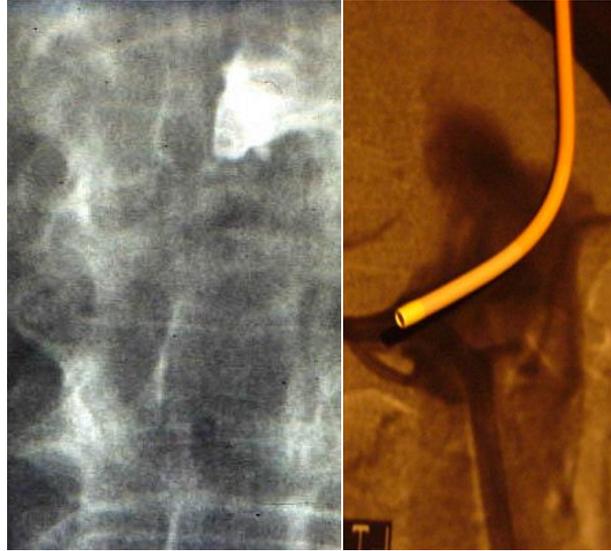
Alternative: 8Fr Guide used for release



8 French Cobra Guide Via No-Touch



What about baseline occlusions

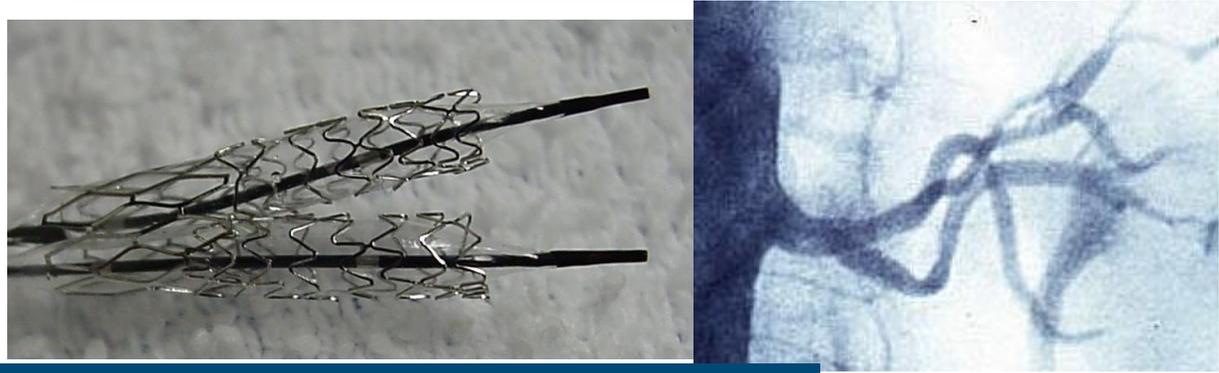
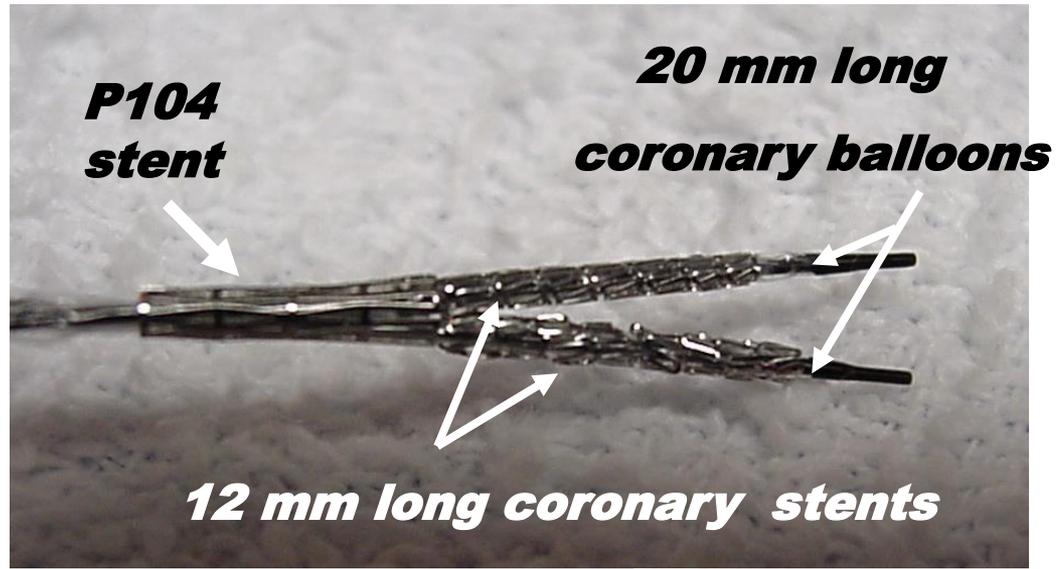
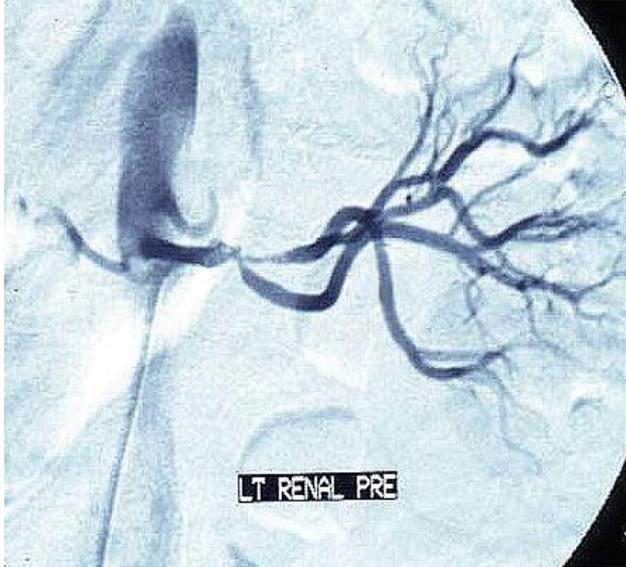


**Telescope 4 Advanced
across .035" Glide**



Guide and interrogation with a Choice PT
Note: Use hydrophilic wires with caution.
They will perforate distal vessels

Bifurcation Lesions



Conclusions

- **ISR (At best IIb data):**
 - **PTA +/- re-stent if under-dilated and >5 to 5.5mm**
 - **Coronary DES for < 4.5mm**
 - **Covered stent or DEB for > 4.5 mm technical optimal index stent placement**
- **Complex Renals**
 - **Should be done by experienced operators with procedure planning focused on anatomic variables**