

Managing the Tortuous Carotid

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Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

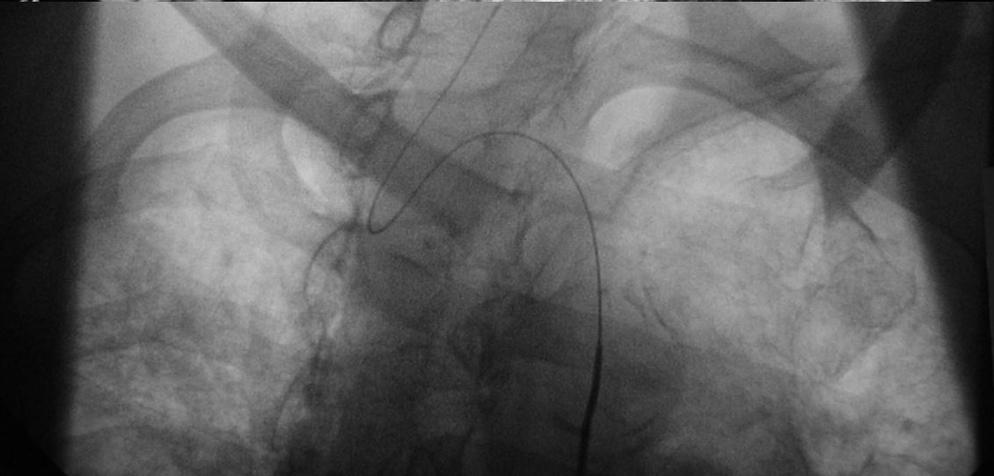
Affiliation/Financial Relationship

- Grant/Research Support
- Consulting Fees (Chief Medical Officer)
- Major Stock Shareholder/Equity
- Royalty Income (modest)

Company

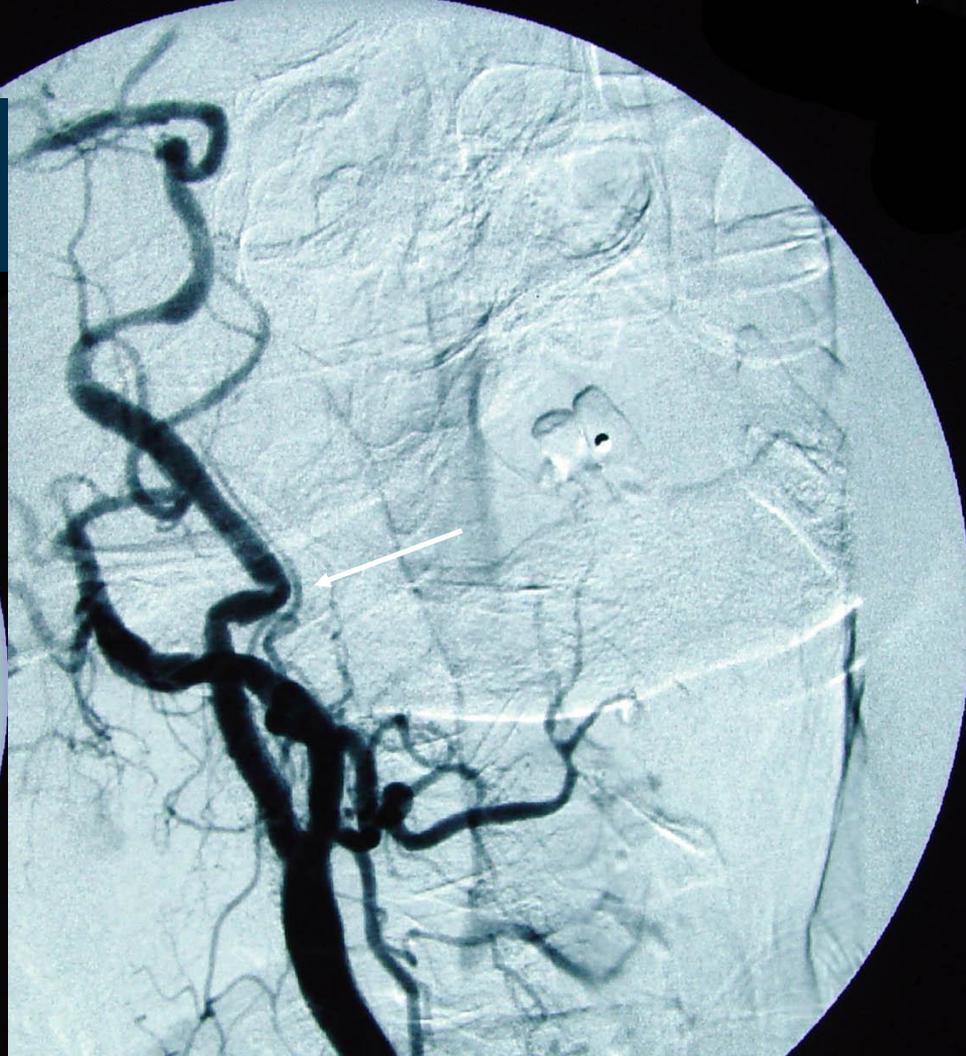
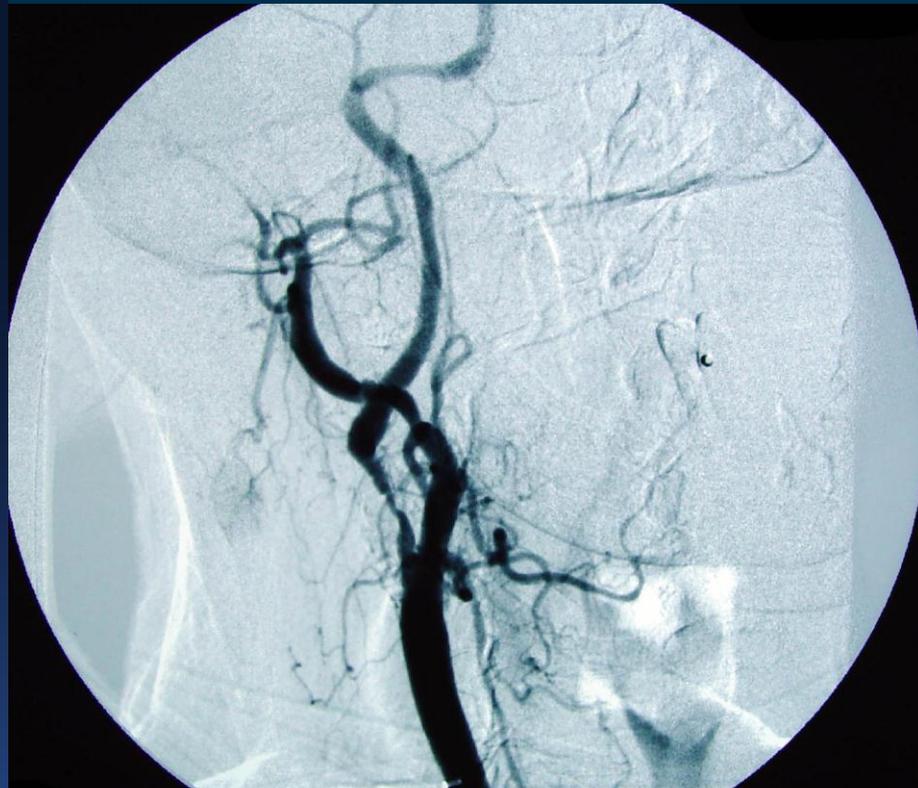
- AbbottVascular, Cordis, Aptus, Gore, Medtronic
- Intact Vascular
- Intact Vascular
- Cook

Tortuosity is not your friend.



Tortuous approach makes sheath access a challenge.

***Tortuous distal arteries
make stenting a challenge.***



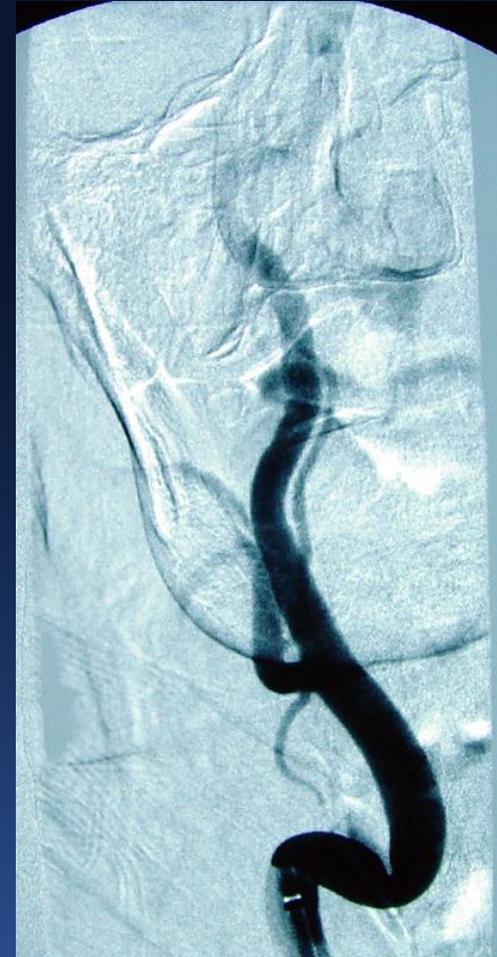
***Stents don't remove tortuosity, they displace it.
Cover shortest possible segment.
Use more flexible stent.***

Tortuosity

Principles

- There is a limit to the degree of curvature in a single vessel that can be safely manipulated (180 degrees).
- When tortuosity is combined with calcification, the degree of manipulation is less.
- Progressive stiffening-buddy wires
- Patient positioning-neck extension
- Stent placement-across kink?
- Filter choice-use free wire system

Tortuous arteries are a set up for injury.



**Tortuosity does not go away!
Maintain a buddy wire to straighten efferent loop.**

Tortuous Great Vessels Attempt to “Spit out” the Sheath





Pre-stent



Post-stent

Straightening one segment accentuates the curvature of another segment.

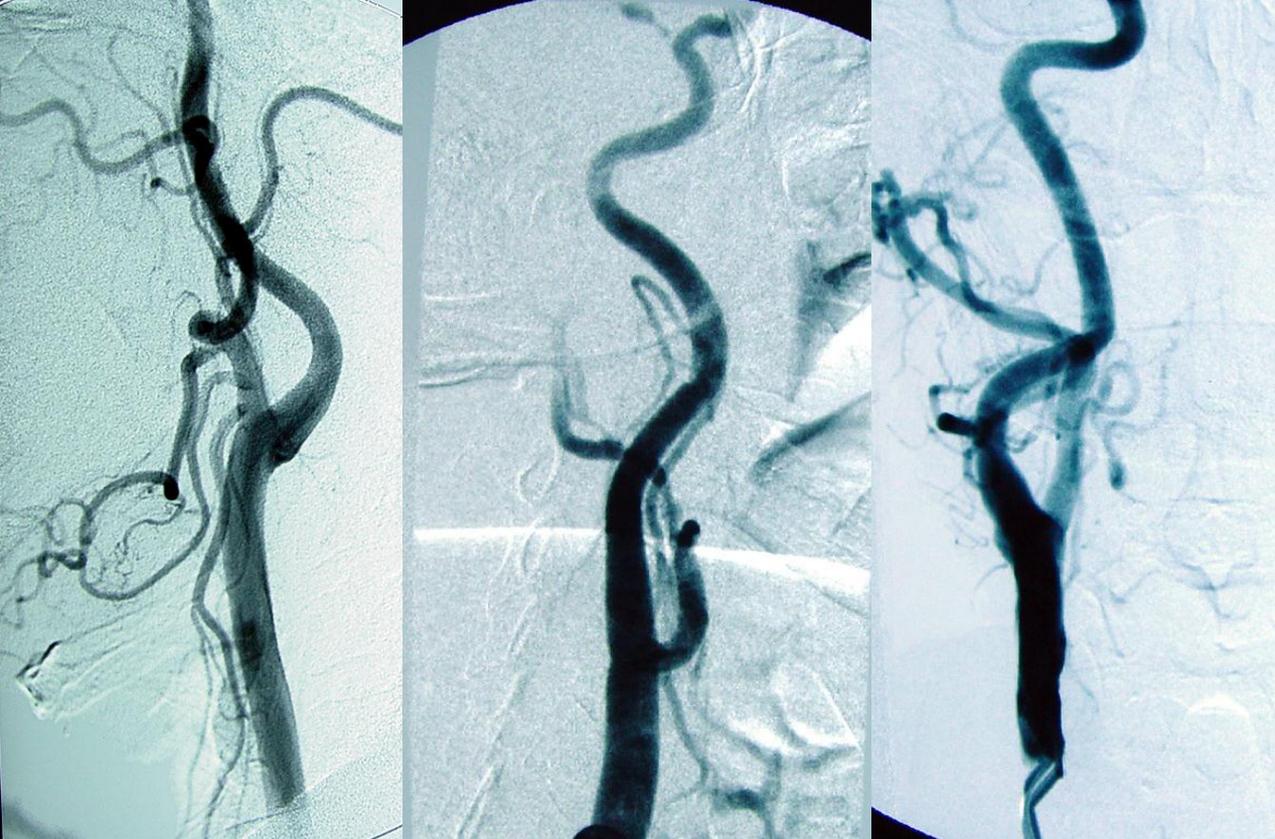
Use Buddy Wire to Deliver the Filter



Pressure point



Lossy: 20:1

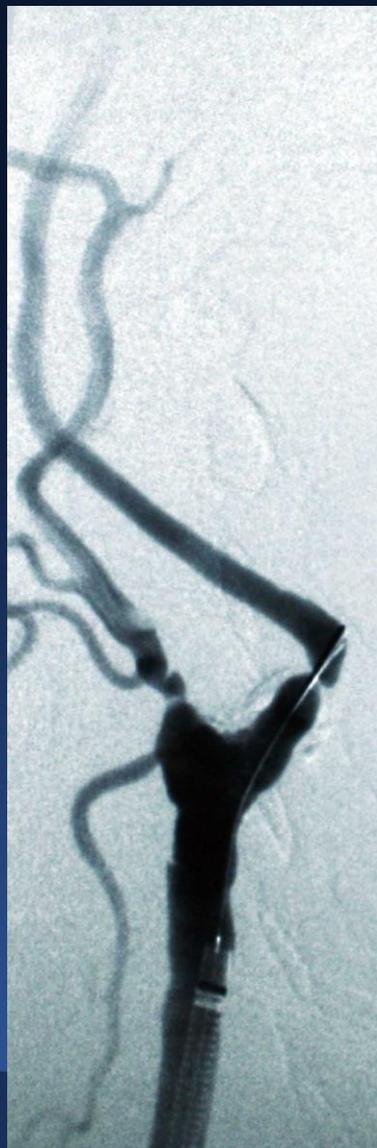
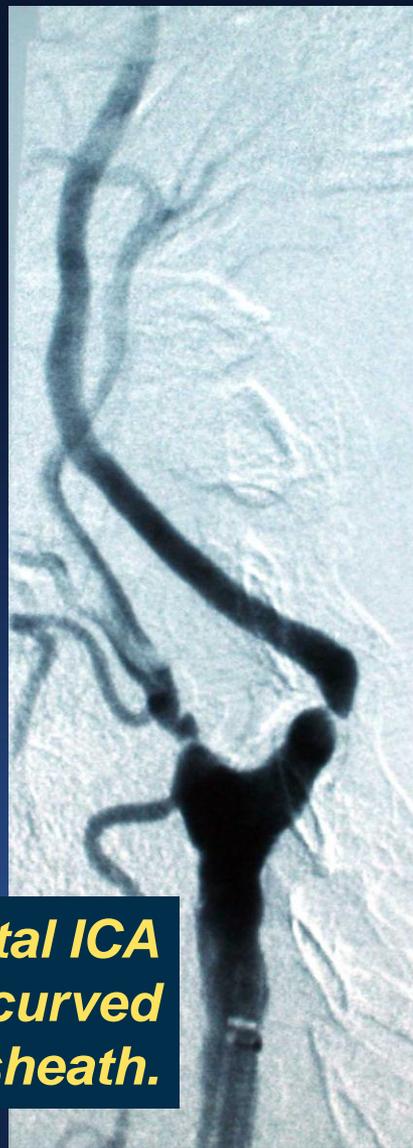
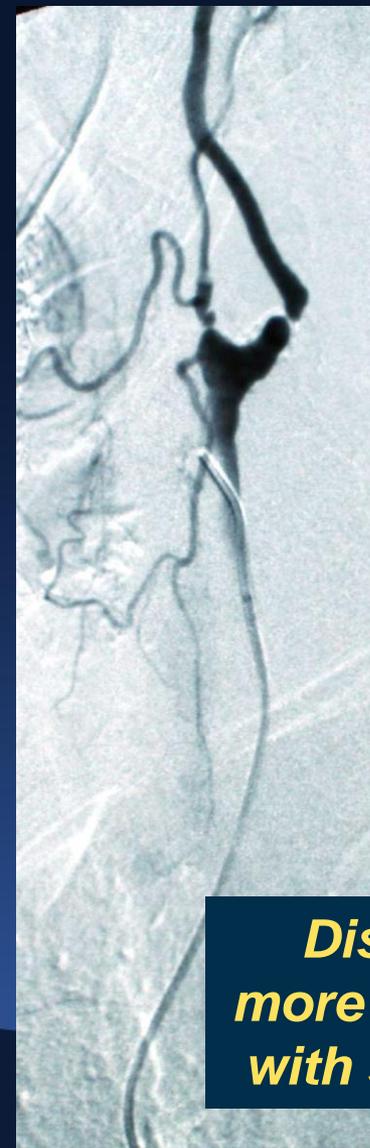


Proximal ICA hardens, widens, and elongates.



If the turn is >1cm distal to the lesion, don't stent across. If it is closer, you will likely have to stent across the turn. If a kink occurs, do not stent further unless there is significant flow limitation.

Tortuosity of the bifurcation and distal ICA makes filter placement and stenting more challenging.



***Distal ICA
more curved
with sheath.***

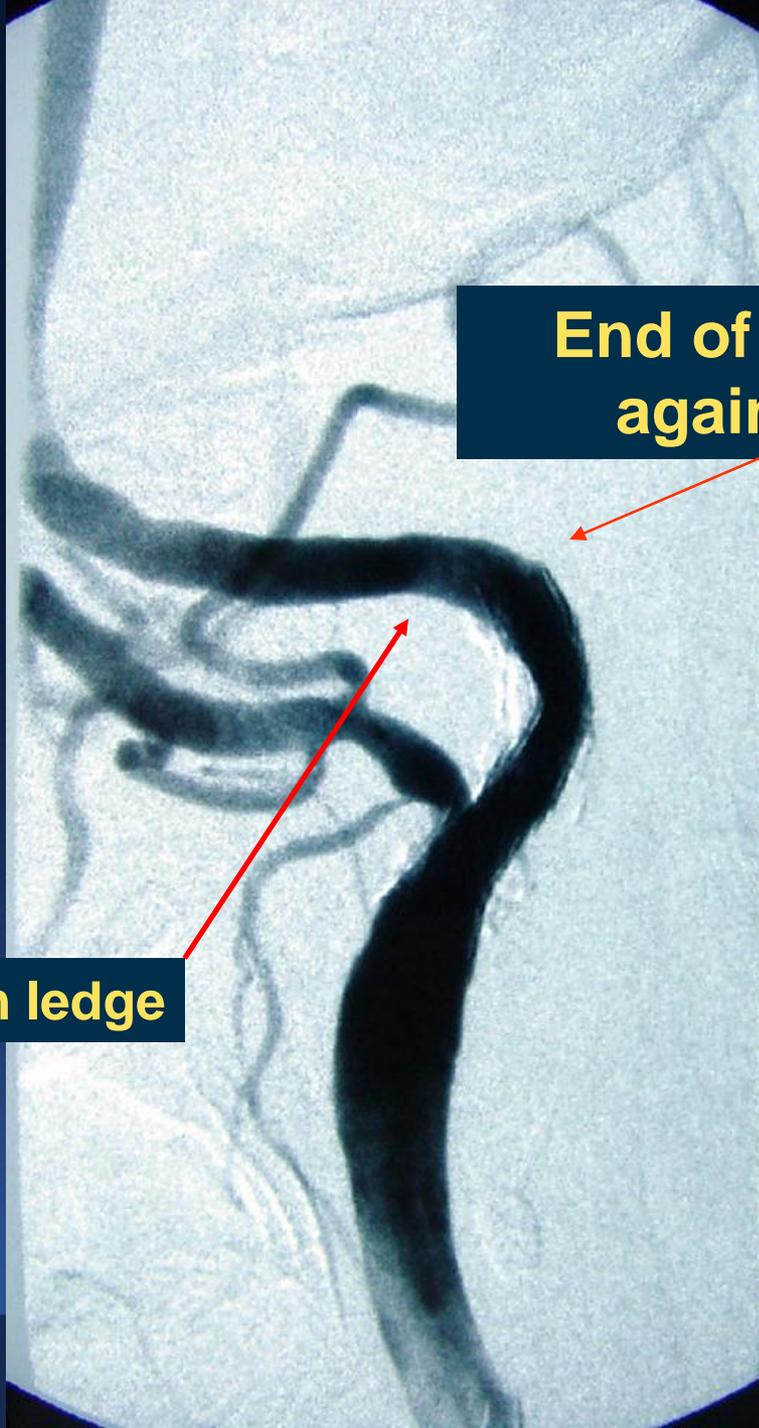
Tortuosity and calcification are a bad combination



Filter →



Despite aggressive pre-dilatation, the stent delivery catheter would not pass.



End of stent is not against the wall.

End of calcium ledge

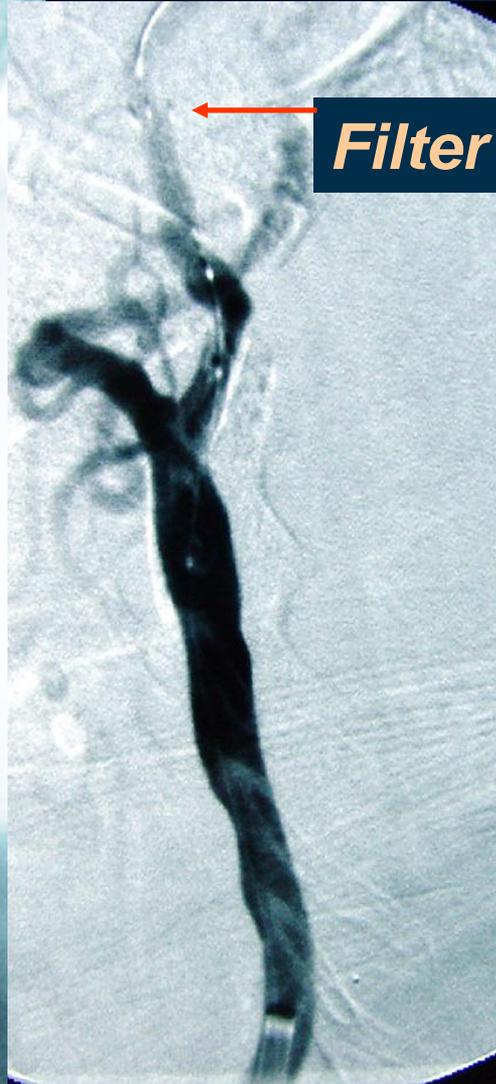
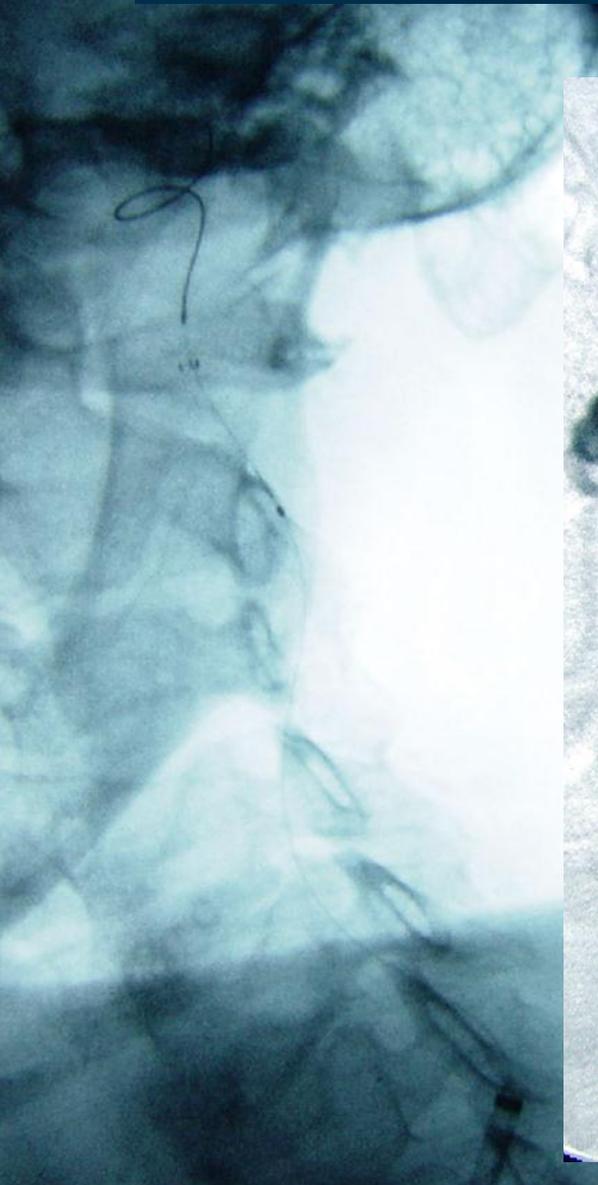
Sheath placement tends to bunch up the distal ICA, which was already tortuous.





**Pull sheath back
a little bit to more
evenly distribute
tortuosity.**

Distal ICA tortuosity limits filter landing zone options.



Filter

**Bushing marker
too close to
stent**



Each maneuver impacts the tension or stored energy in the system.

Tortuosity

Conclusion

- **Great vessels-affects sheath access and stability**
- **Bifurcation-stent choice (open cell), passage, location of stent placement**
- **Distal ICA-choice of protection, filter landing zone, filter retrieval**