Untwisting the twisted

Percutaneous retrieval of twisted catheter in brachial artery using a percutaneous transluminal coronary angioplasty guide wire and a balloon

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Conflict of Interest

- None

Background

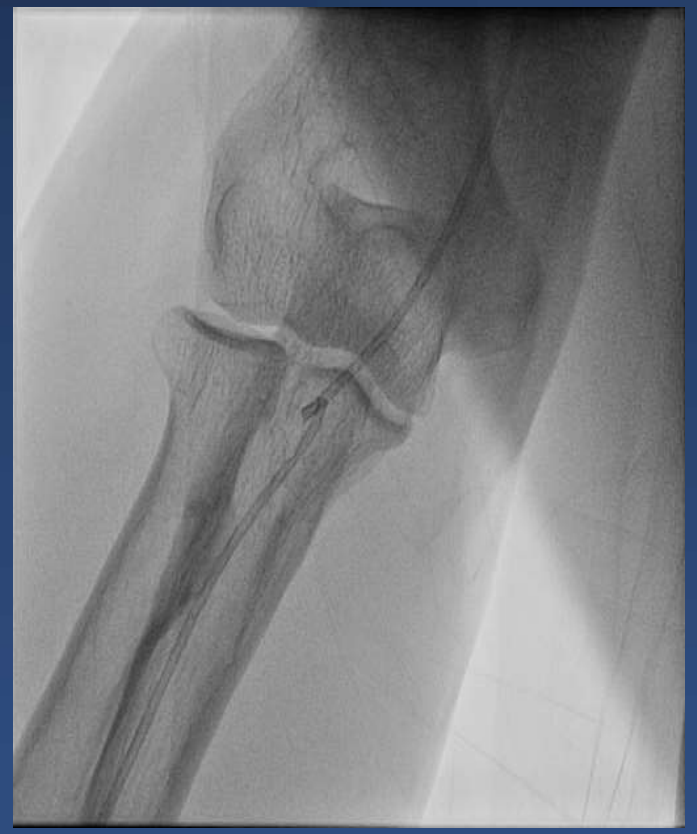
- 63 year old gentleman
- Known diabetes mellitus and hypertension
- Chronic stable angina, class II
- Normal 2D echocardiography
- Exercise ECG positive at stage II (7 METs)
- Planed for routine coronary angiogram

Coronary angiogram and complication

- Right radial approach with 5Fr sheath - *Tortuous subclavian artery*
- Right coronary artery engaged with 5Fr Tiger catheter
- Left coronary artery - difficult engagement
- Engagement failed with 5Fr Tiger and 5Fr Judkin's left (JL) catheters
- Decided to use 5Fr Backup left (BL) catheter - *Radial artery spasm*
- Catheter was manipulated multiple times - Sudden *loss of aortic pressure tracing*
- Immediate fluoroscopy - twisting and looping of the catheter at tortuous subclavian artery

Attempts to retrieve the catheter from radial access

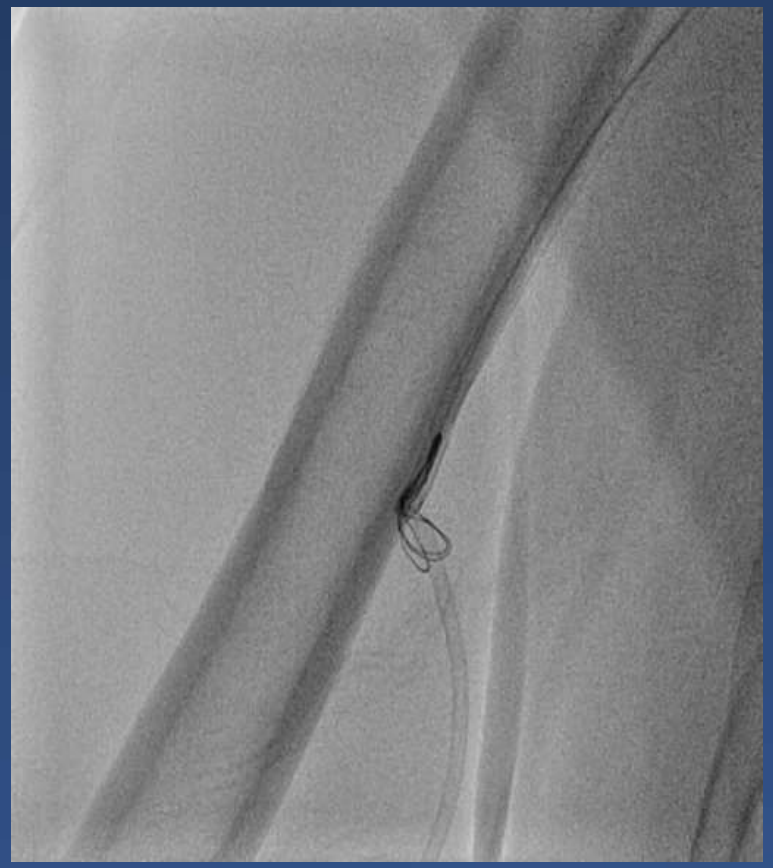
- Multiple attempts to open the loop
  - Rotating the catheter in opposite direction -failed
  - Pass the 0.035” guide wire and a 0.014” PTCA guide wire -unable to cross the kinked segment
- Gently pulled the catheter with counterclockwise rotation
- Kink segment was stuck in the brachial artery without untwisting.



Attempts to retrieve the catheter- Secure the upper end

- External pressure
  - Manual
  - Sphygmomanometer cuff inflated at 20mmHg above systemic pressure -failed.

- Snare the tip of catheter
  - Right femoral access with 7Fr sheath
  - Judkin's Right (JR) catheter was advanced into the aorta
  - Multiple attempts with gooseneck and endovascular snare - failed



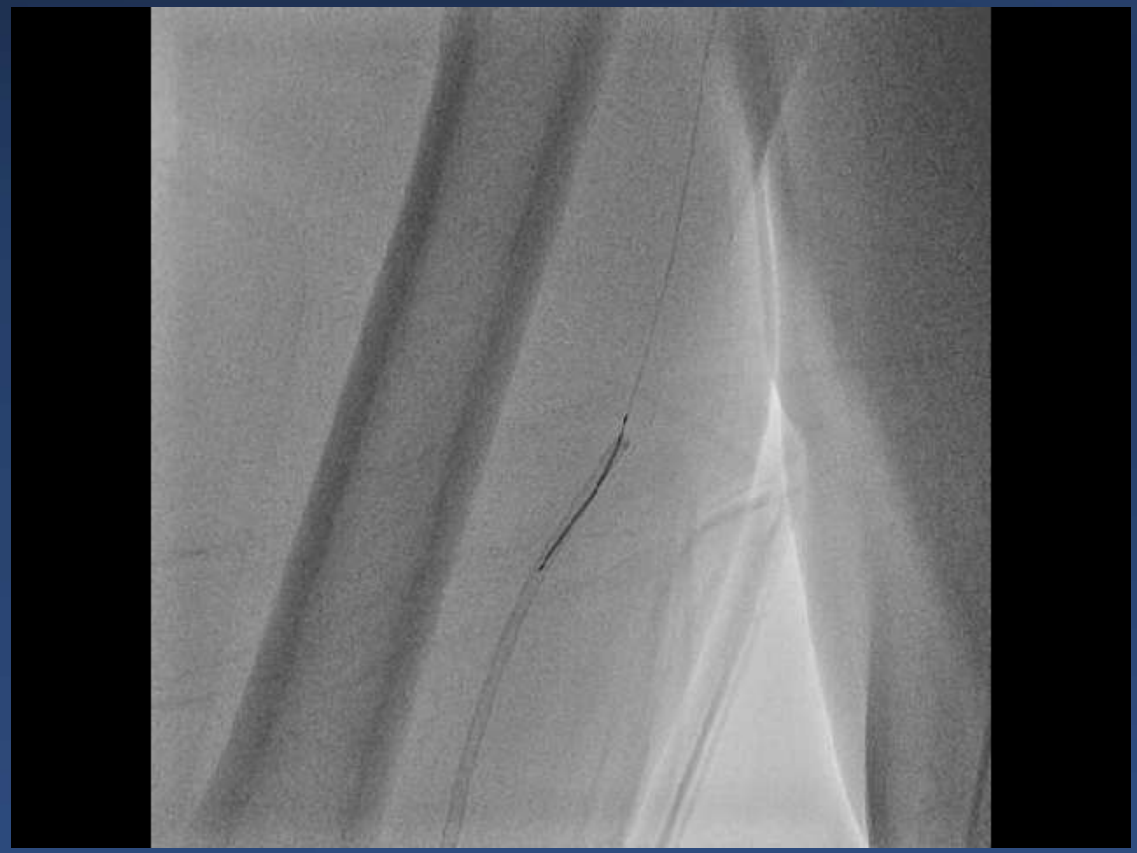
Successful retrieval of the kink catheter

- Strategy - wire the kink BL catheter opposite direction through femoral JR catheter

Successful retrieval of the kink catheter

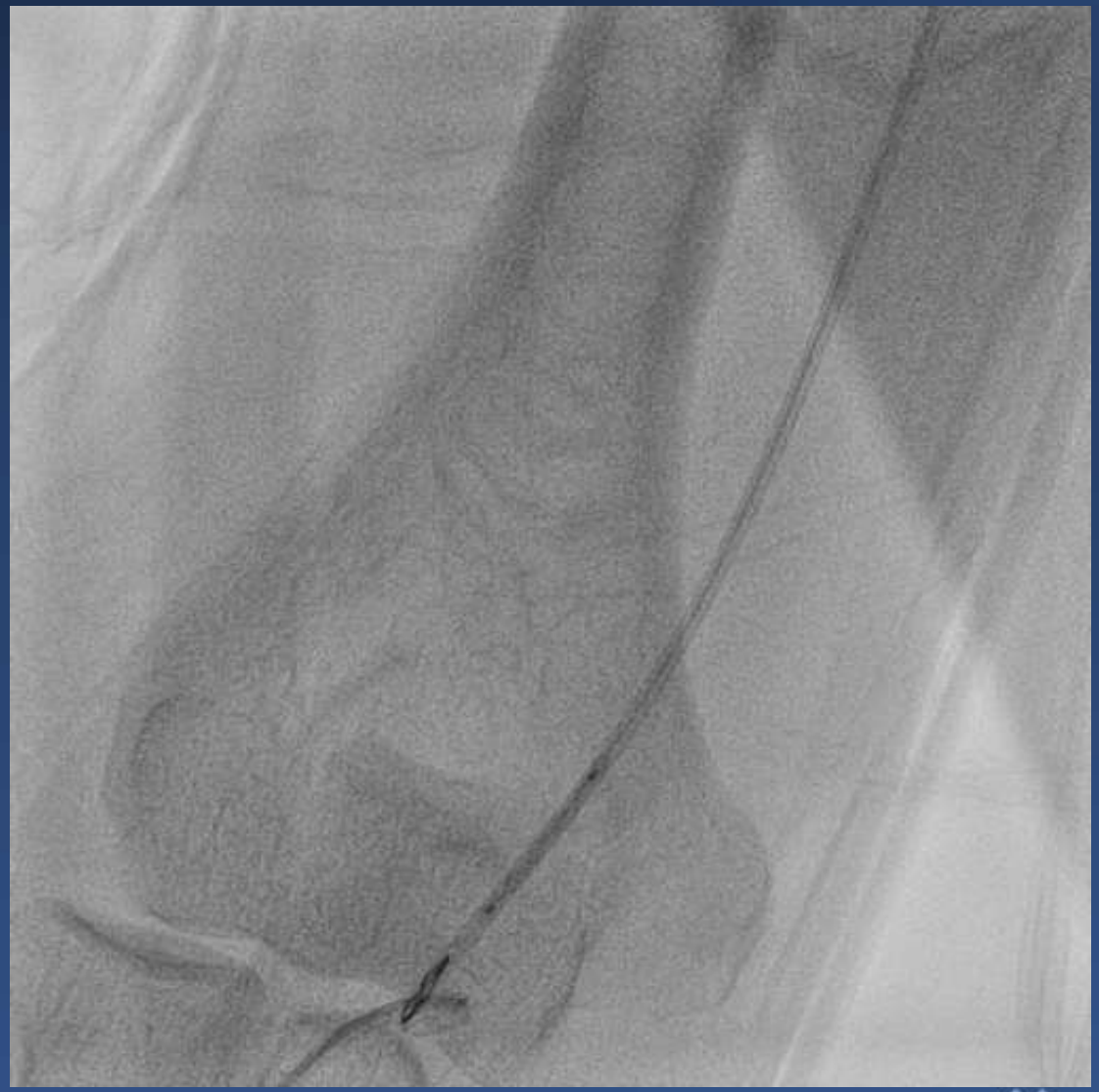
- 0.014” PTCA guide wire was able to cross through the tip of kink BL catheter after several attempts and advanced up to kink segment

- Then 2mm x 15mm PTCA balloon was advance and inflated to 18atm within the kink BL catheter and secured



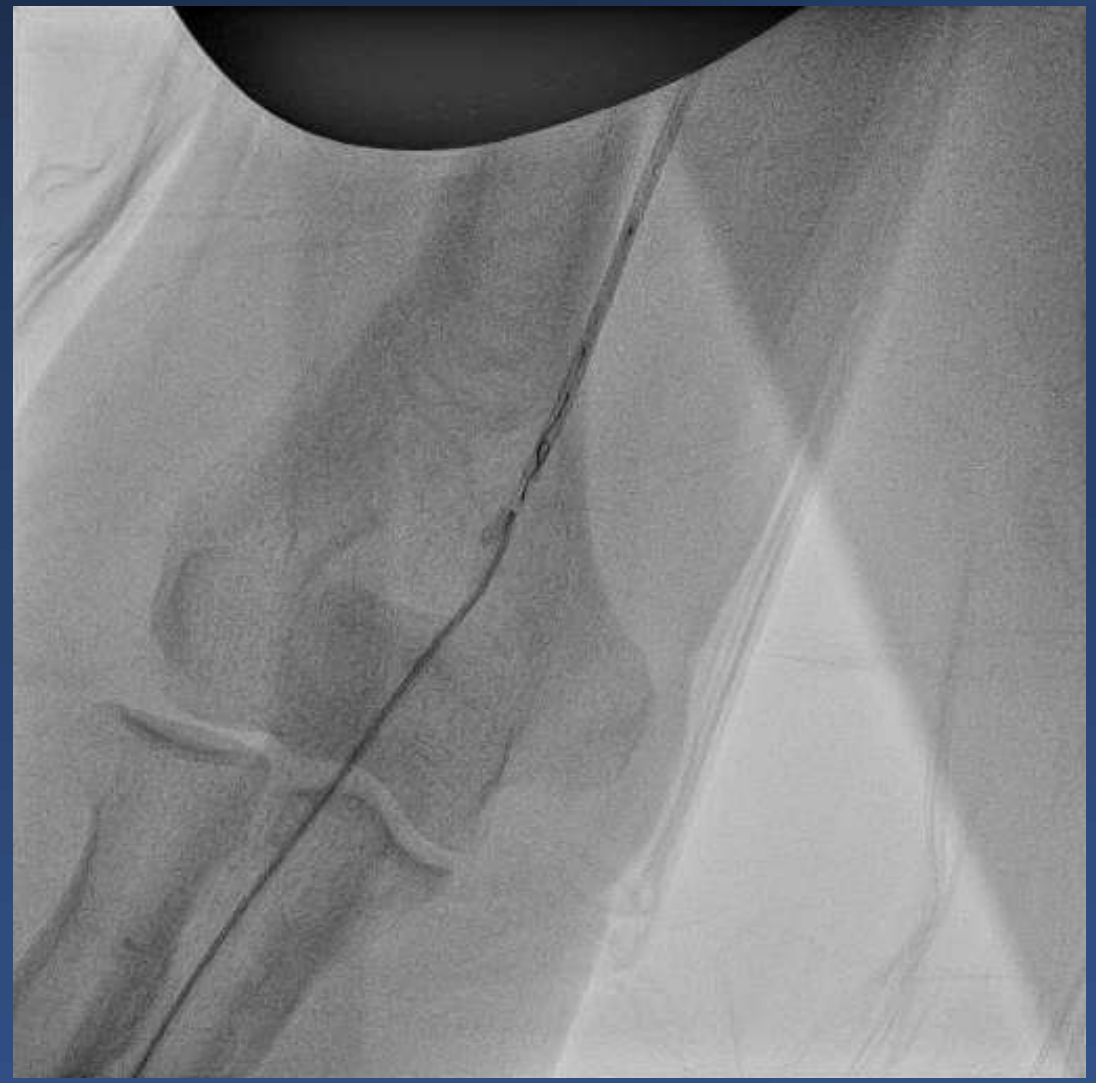
Successful retrieval of the kink catheter

- The kink 5Fr BL catheter was gently pulled in to the JR catheter, similar as *mother and child technique*



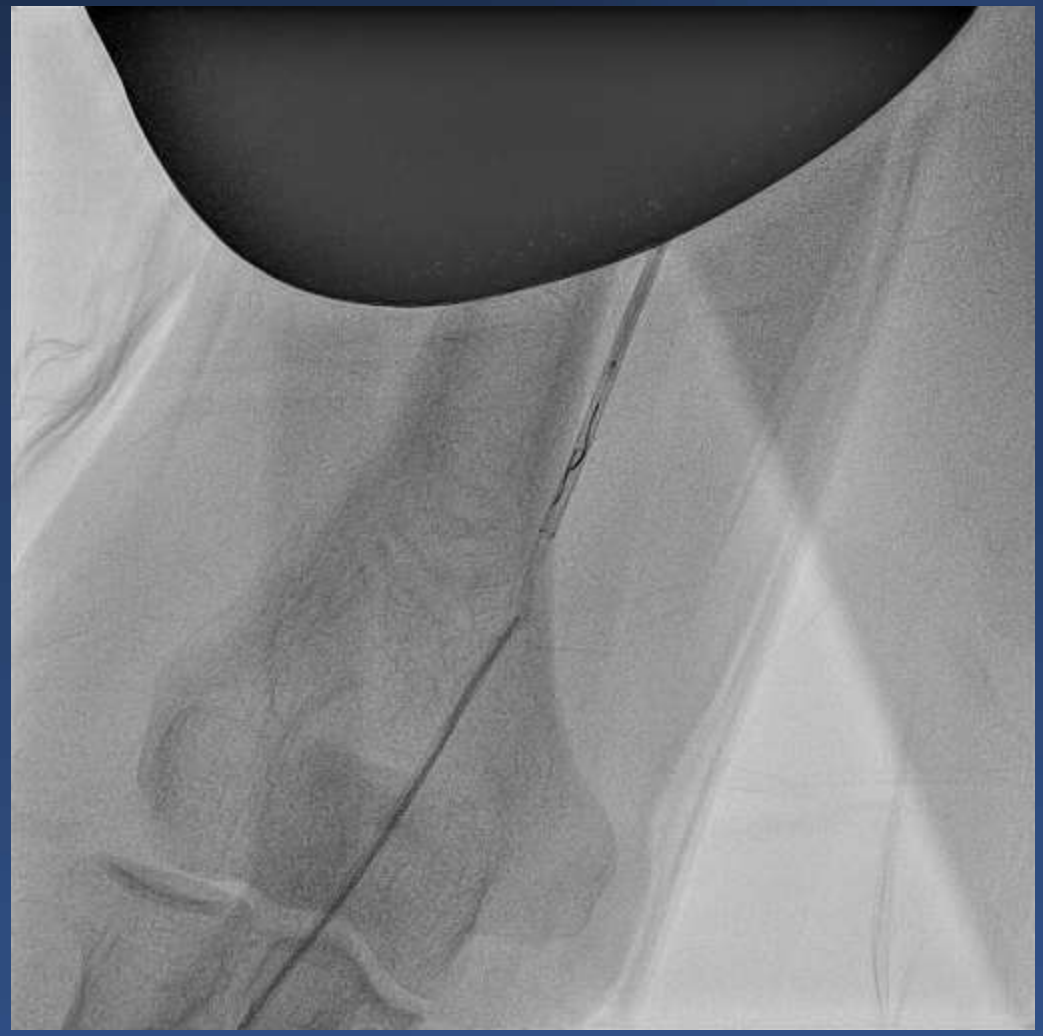
Successful retrieval of the kink catheter

- Gentle counter clockwise torque with traction was applied from the radial end of the BL catheter
- Gentle opposite torque with traction was applied with femoral JR catheter till successful untwisting was achieved



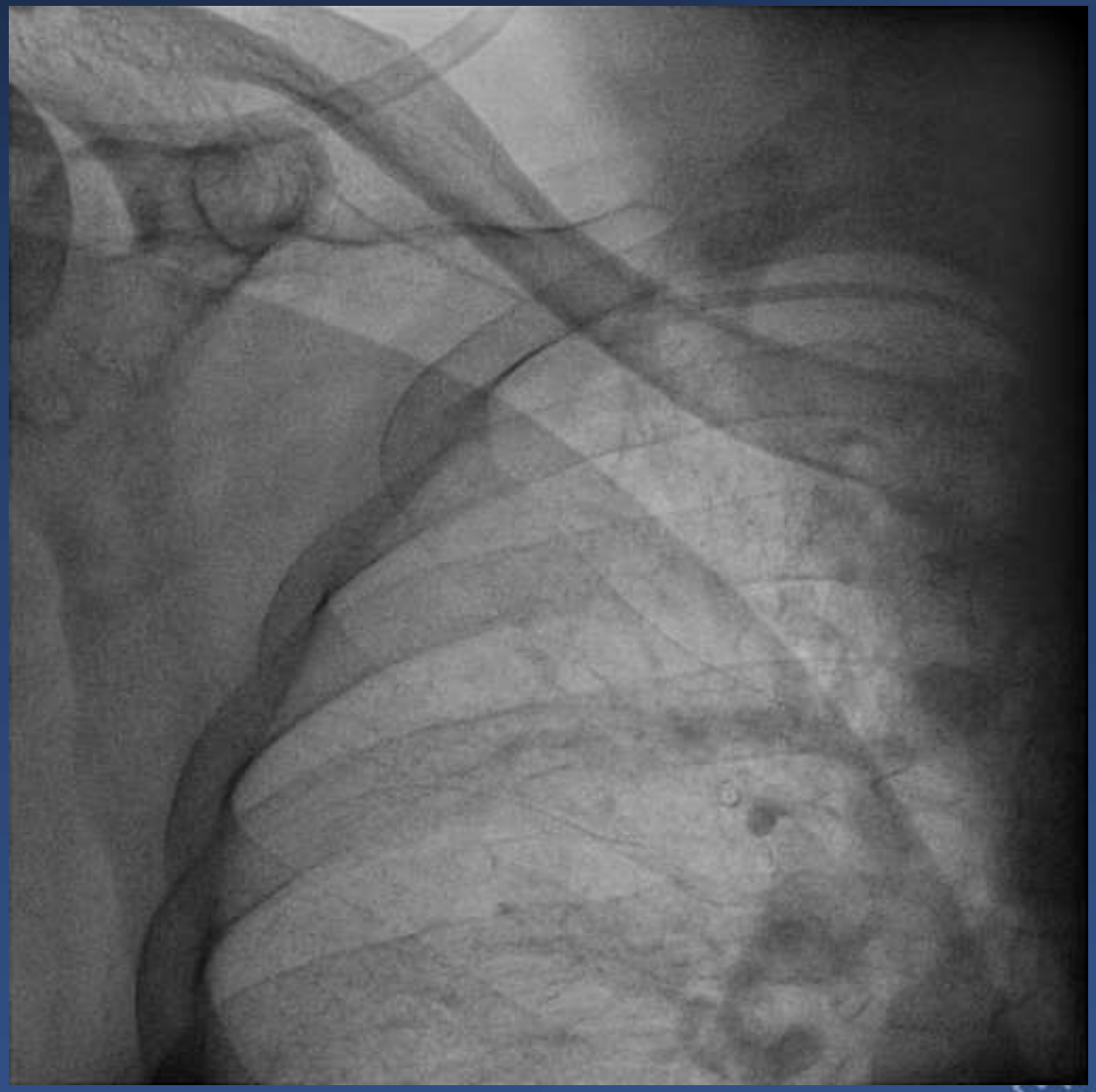
Successful retrieval of the kink catheter

- 0.035” wire was passed though the BL catheter and the kinked portion was crossed
- Balloon was released and the catheter was successfully retrieved from radial route



Post procedure angiogram

- Artery remained patent with spasm
- No significant damage



Discussion Points

- Factors facilitate kinking or twisting of catheter
- How to prevent kinking of catheter
- Signs of catheter kinking
- Different techniques for retrieval of the kink catheter

Conclusion/Take-home Message

- Entrapment of a kinked catheter is rare but known complication
- Utmost care is important to *avoid excessive manipulation* in case of significant *vessel spasm* and *severe tortuosity*
- Loss of pressure waveform, limitation of torqueability or enhanced resistance to injection are all *signs of catheter kinking*
- Multiple different techniques can be used to manage this complication. We recommend a *stepwise approach*, starting with minimal invasive simple technique
- Proper decision and safe innovative techniques can avoid vascular surgery