Tips and Tricks for PCI Success

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Key Tips for Success

• A summary of some key tips and tricks for solving commonly encountered and complex problems in the cath lab
• Having these tricks in your bag can help make a complex case go more smoothly
Radial vs. Femoral

• **Radial “first” strategy:**
  - Patient comfort
  - Less bleeding
  - Same day discharge, even post-PCI
  - No need to tie up staff for groin holds
  - Associated with lower overall cost

• **Femoral access for:**
  - Complex anatomy
    - Extreme tortuosity, calcification, multiple previous stents, CTOs
  - Need for hemodynamic support device
  - Known radial/brachial/subclavian tortuosity or arteria lusoria
**What French Size Should I Use?**

- **6 French system:**
  - No tortuosity
  - Bifurcations that will not require 2 simultaneous stents
  - Not calcified
  - Not very distal
  - No previous stents to navigate through

- **7 French system:**
  - Extra support
  - Simultaneous stents/complex bifurcations

- **8 French system:**
  - Excellent support
  - Simultaneous balloons/stents
  - Calcified lesions: More Rotablator options
Managing Tortuous Iliacs

- Use Wholey/Versacore wire (with a bend) inside JR4 to navigate up iliacs, then exchange for Amplatz wire
- Use a long braided sheath (ie: Arrow) with a guide catheter 1 French size smaller
  - Less friction in system
  - Easier to torque
- Use 0.63 wire
  - Keeps guide from kinking
  - Improves torqueability
I Can’t Deliver Balloon/Stent!

- Larger French System (should have done it in the first place!)
  - Can exchange over stiff guidewire (ie: Grandslam, Mailman)
- AL1 for RCA vs. JR4 with GuideLiner/Guidezilla
  - AL1 good support but risk for proximal dissection and acute AI
  - Guideliner/Guidezilla with JR4 allows variable support and easier PCI of ostial lesions
- Buddy wire
- Wiggle wire
- Buddy Balloon
  - Non-inflated
  - Inflated: “Anchor balloon”
- Guideliner/Guidezilla
- Use multiple shorter stents
- Combinations of the above
The Guideliner/Guidezilla: A Game Changer

• “Torpedo” technique
  ▪ Advance Guideliner/Guidezilla distally using an inflated balloon at tip as a soft dilator

• “Variable Guide” technique
  ▪ Can use with a less supportive guide (ie: JR4) and used to vary support for distal vs. proximal interventions

• Often use 6Fr inside a 7Fr or 8Fr guide
  ▪ Can pass 6Fr Guideliner/Guidezilla deeper into vessel
  ▪ Allows better guide support

• Can also be used to minimize contrast exposure and as an “unsheathing” tool
Variable Guide Technique

Shape change of guide

Deep intubation of coronary

Deep intubation adds greatly increases contact within coronary artery greatly increasing support

Shape change of JR4 into ‘Amplatz Left’ shape increases contact aorta increasing support
• Tortuous RCA

• Distal lesion

• AL1 deep-seated into RCA

• Stent will not get past mid RCA due to tortuosity
• “Anchor” balloon technique
• Buddy wire advanced into distal RCA
• 2.75mm compliant balloon advanced over buddy wire into distal RCA and inflated
• Stent can now be advanced over first wire into distal RCA
• Buddy wire and balloon then removed
• Stent positioned across lesion and deployed
• Final Results
- Tortuous RCA with distal disease...

- Proximal RCA has mild disease

- Calcified mid RCA

- Very tortuous Iliacs ...

2 diagnostic catheters kinked trying to engage RCA!!
• 8Fr Long Arrow braided sheath with 7Fr JR4 guide
• “Gardenhose” used to torque catheter into RCA without kinking
• 6Fr Guideliner
• Wired initially with OTW balloon and Pilot 50 wire
• Pilot 50 exchanged for Wiggle Wire
• Shorter stent used because longer one wouldn’t track

• Note “Amplatzification” of JR4 guide with GuideLiner
• Second shorter stent advanced
• Distal RCA appearance after 2 overlapping stents placed
• Guideliner retracted back to address mid/prox disease
• Tortuous and ectatic RCA

• Calcified proximal and distal lesions - previous operator unable to dilate with non-compliant balloon!
- 8Fr AL1
- 1.5mm Burr
• 1.5mm Burr
• Initial plan to treat distal lesion first but...

Balloons/stents would not get past proximal lesion!

Stent proximal lesion first!!
- 4mm DES deployed
• Post-dilated with 6mm balloon
• Appearance after proximal stent deployment
• “Torpedo” technique
• 6Fr GuideLiner advanced through proximal stented area using 2.5mm compliant balloon as a soft dilator
• Distal lesion predilated with non-compliant 4mm balloon

• Not going to dilate???
• 4mm DES positioned and deployed
• Post-dilated with 6mm non-compliant balloon
• Minimal contrast injection required to see distal vessel well
• Final results

• Distal flow known to be excellent from previous distal GuideLiner injection
If you can’t engage the coronary:

- **Can engage with diagnostic catheter, but not with a guide**
  - Engage with diagnostic catheter, then wire coronary with stiff/supportive wire and then exchange carefully for the guide.

- **Can see the coronary, but can’t directly engage it with diagnostic catheter or guide**
  - Make a custom guide using heatgun.

- **Can’t torque catheter well enough to engage**
  - Long sheath/guide 1 Fr size smaller
  - “Gardenhose” .063 wire
  - Go from radial approach if iliacs too severe.
I Can’t Engage the Coronary!

- Gently focus heat in area to be bent
- Avoid melting catheter!
- Avoid burning yourself!
- Quickly dip into flush bath to cool it and “freeze” shape
• Anomalous LCX
• Diseased anomalous LCX

• Where exactly does it come off?
• Posterior takeoff very close/shared with RCA
• JR4 initially tried
• Keeps diving into RCA too deep to engage anomalous LCX
• Guidewire inserted into RCA to help stabilize JR4
Custom Multi-purpose Catheter

• Tip partially bent so as not to engage too deeply into RCA
Coronary cannot be engaged directly by custom guide, so Grandslam inserted into RCA via JR4 and JR4 exchanged out for custom guide
• Custom guide sits at the ostium of RCA and does not dive too deeply into RCA

• Allows LCX to be wired with hydrophilic wire
• Distal lesion predilated with compliant balloon
• 6Fr GuideLiner used to deliver stent into distal LCX
• Guideliner withdrawn to expose next area to be stented
• Second stent positioned and deployed
• Anomalous RCA
• NSTEMI culprit vessel
• Extremely tortuous iliac system and ascending aortic aneurysm
• Multiple catheters used in an attempt to engage RCA
• This is the closest to engagement
• Can see it....

• But can’t engage it!
• Partially engaged RCA, but pops out nearly immediately
• Left radial approach to avoid extremely tortuous iliac system

• Custom multi-purpose guide created with heatgun to allow enough reach to engage RCA
Pilot 50 wire used to wire vessel carefully
• OTW balloon would not traverse tortuosity

• Corsair catheter successfully advanced into distal vessel

• Pilot 50 exchanged through Corsair for a Wigglewire
OTW Balloon Wont Go?
Use Specialty Support Catheter

- Much more trackable than an OTW balloon
- Can spin Corsair and Turnpike catheters to reduce coefficient of friction to cross lesions easier
Lesion predilated
- Improved flow

- Significant proximal tortuosity!
• From another vantage point

• Stent advanced across lesion
• Stent deployed
• Non-compliant balloon will not advance through stent struts

• "Torpedo" technique used to advance GuideLiner into prox RCA

• Non-compliant balloon successfully delivered
Final Results
It’s Not a CTO but…
I Can’t Wire This Vessel!

- **Wire won’t torque or prolapses?**
  - Use an OTW system for support
  - Hydrophilic wires torque easier and cross calcified/tortuous lesions easier
  - BUT can also “get behind” plaque easier and cause vessel closure/dissection

- **Extreme tortuosity?**
  - Venture catheter

- **Severe disease/dissection?**
  - Careful use of hydrophilic soft wires
  - Use of the “progressive true lumen” approach
• NSTE MI
• Tortuous iliacs
• Long 8Fr sheath with 7Fr guide
• Graft to LAD closed
• Severe native LAD lesion
• 35 mins of fluro spent trying to wire LAD…..
• Wires successfully inserted into septal and diagonal, but not LAD!
• Poor flow and ?dissection in LAD
Further attempts to wire LAD are unsuccessful - wires go into dissection plane.

Decision made to balloon ostium of septal across ongoing LAD with 2.0 mm balloon.
• Wire partially inserted into LAD, but not free and appears to be in dissection plane.
• Wire left in LAD dissection plane

• Fourth wire advanced into small septal branch that comes off LAD downstream of the large first septal branch

• Small septal dilated with 1.5mm balloon
• Small septal comes off true lumen of LAD just downstream of large first septal

• OTW balloon advanced into small septal branch and wire exchanged for hydrophilic wire with 90 degree bend
• After hydrophilic wire advanced into true lumen of distal LAD, OTW balloon advanced and wire exchanged for BMW

• Balloon angioplasty of LAD performed
Appearance after angioplasty...
Final results after stent placement
"Progressive True Lumen Approach"

Can’t pass wire due to dissection or plaque

Target Vessel

#1 Wire small sidebranch off true lumen

#2 Dilate into sidebranch and exchange wire for 90 degree bend or angled catheter

#3 Carefully redirect wire into true lumen

#4 Dilate and stent into target vessel

#1 Wire small sidebranch off true lumen
Uh Oh… I Have a Perforation!

- Good practice to take a small “puff” after a balloon is deflated to be sure there is no perforation
- If perforation noted, FIRST thing to do is re-insert balloon and tamponade the bleed
- Consider reversing heparin with protamine, stop Angiomax
- JoStents can be very difficult to deliver!
  - Get second access - VERY important!
  - Leave balloon up from first guide while second guide is positioned
  - “Dueling Guide” technique
• LAD stent deployed
• Uh oh....

• Fortunately, balloon still in place

• Immediately inflate balloon to tamponade bleeding
• Balloon left up while second access obtained with 8Fr guide
• Second guide brought into position
• Wire from second guide brought down to balloon, balloon quickly deflated, wire passed, then balloon reinflated
• JoStent advanced into prox LAD
• Balloon deflated and quickly withdrawn into guide and JoStent quickly advanced into position
• Jostent deployed
• Perforation sealed!
I Have Stent Regret!

- Deployed a stent, but now it won't expand!
  - High pressure balloon inflation
  - Rotablator
    Use 2mm burr and GO SLOW - don’t advance too hard..... Or burr can get trapped!
    (OFF LABEL!)
  - Laser technique
    Use 0.9mm laser catheter with contrast infusion rather than saline
    (OFF LABEL!)
• Distal RCA disease
Lesion seems to expand with 2.75mm balloon
• 3.0mm stent deployed to 18 Atm
Second 3.0mm stent deployed just proximally
• 3.25mm non-compliant balloon to 30 Atm!!
• 0.9mm laser catheter
• Contrast infused rather than saline
• ? micro bubbles!!
• Expands now with 3.25mm non-compliant balloon!
• 2.5mm stent at PDA ostium
• Final Results
Thank You