Re-entry Approach to CTO

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Complex PCI and CTO program
Disclosures

• None
Concepts

- AWE/ADR
- RWE
- RDR

Fundamental Dissection-Reentry Concepts

• **Dissection:** no longer a complication, but a mode of treatment

• **Sub-intimal stenting:** feasible, safe and associated with good long term results
Fundamental Dissection-Reentry Concepts

- **Dissection:** no longer a complication, but a mode of treatment
- **Sub-intimal stenting:** feasible, safe and associated with good long term results

**Contemporary D-R:** aims to revascularize (not loose!) every (proximal and distal) side branch
Rationale for D-R

• **Safe**: stay within the vessel architecture

• **Efficient**: quick and safe crossing of long occluded segments

• **Predictable**: a connection between the proximal and distal CTO segments can be more reliably connected
D-R – When?
Length

Proximal

Long CTO

Distal

>20mm
If LONG ambiguous and / poorly defined:
Dissection Re-entry
D-R – When?
Unknown path or tortuosity
D-R – When?
Calcification
Step-by-step Reentry Techniques
To Re-enter, you must first exit!
How to create a Dissection

1st Step
Cap: tapered or blunt?
How to create a Dissection

2\textsuperscript{nd} Step

Cap: tapered
Knuckle guidewires:

Fielder XT
Pilot 200
How to create a Dissection

2\textsuperscript{nd} Step

\textbf{Cap}: blunt $\rightarrow$ penetrate the cap

Penetration wires:

\textit{Hornet 14 / Confianza Pro 12: 12g}
How to create a Dissection

3rd Step
Cap: blunt -> penetrate -> advance microcatheter
How to create a Dissection

3rd Step
**Cap**: blunt -> penetrate -> advance microcatheter
-> Knuckle guidewire
How to create a Dissection BASE (balloon assisted subintimal entry)

Inflate balloon in proximal vessel 1:1 to try and create a sub-intimal tear

Antegrade
How to create a Dissection

Carlino technique
(microcatheter injection)

Antegrade/Retrograde
How to create a Dissection
Scratch & Go

Antegrade/Retrograde
How to create a Dissection CrossBoss

Antegrade
(Not a good starter, but good finisher)
Re-entry Techniques

• **Antegrade**
  – STAR
  – Stingray balloon
  – ....

• **Retrograde**
  – Reverse CART
  – Guideliner-assisted Reverse CART
Re-entry Techniques - Antegrade STAR
(Subintimal tracking and re-entry)

Bail-out option!
Re-entry Techniques - Antegrad
Stingray Balloon

CAUTION—Investigational device. Limited by United States law to investigational use.
Re-entry Techniques – Retrograde

Reverse CART

(Controlled Antegrade and Retrograde Subintimal Tracking)
Re-entry Techniques – Retrograde

Reverse CART

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Re-entry Techniques – Retrograde

Reverse CART

(Controlled Antegrade and Retrograde Subintimal Tracking)
Re-entry Techniques - Retrograde
Guideliner Reverse CART
Difficult situations

- CrossBoss or Wire tracks branches
- Need of extra support to start dissection
- Difficult antegrade balloon crossing
- Reverse CART: wires in different spaces
Case

55 yo male
  – PMHx: hypertension, dyslipidemia

Presentation:
  – Stable Angina CCS2
Conclusions

• Dissection-Reentry techniques allow for effective and safe CTO recanalisation
• Longer term results seems favorable despite extensive dissection
• Hybrid perspective is key to high success rates
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