Duplex ultrasound (DUS) -guided BTK intervention

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Disclosure

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I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

✔ I do not have any potential conflict of interest
Concept of DUS-guided Intervention

Seeing is better than feeling.

DUS-guided puncture  DUS-guided CTO wiring

From ATK Intervention to BTK Intervention!
Setup 1; DUS-guided BTK Intervention

- High performance US equipment and high skill technician

GE Logic E9

L8-18T (18MHz)

ML6-15 (15MHz)
Setup2; DUS-guided BTK Intervention

• Position in our cath. labo
Usefulness of DUS Guidance in BTK CTO Wiring

- Wire navigation
  - 0.014inch stiff GWs
  - Support Microcathters
- Distal tibial puncture for bidirectional approach
  - 22G Plastic Cannula
  - Free hand puncture
Wire navigation using DUS guidance

Typical Wiring for Long PTA CTO
Wire navigation using DUS guidance

Wiring for Long PTA-Planter CTO

Difficulty of Distal Tibial Puncture
Wire navigation using DUS guidance

Wiring for Long PTA-Planter CTO
Wire navigation using DUS guidance
Wiring for Long PTA-Planter CTO
Wire navigation using DUS guidance

Wiring for Long PTA-Planter CTO

GW could not be identified in the lumen.
Wire navigation using DUS guidance

Wiring for Long PTA-Planter CTO
Severe Calc. is Major Limitation of DUS Guidance
Tips and Tricks

- Location of calcified plaque and guide-wiring -

Calcified plaque located at the posterior wall

Navigate the guide wire between anterior wall and calcification.

Calcified plaque located at the anterior wall

True lumen is difficult to identify due to acoustic shadow of calcification.
Tips and Tricks
-Location of calcified plaque and guide-wiring-
Initial Results of BTK CTO Wiring in 2012

Unidirectional Wiring (UDW); 386 BTK CTOs

Fluoroscopy+DUS-guidance; 292 (75.6%)

Final Success; 332 (86.0%)
UDW-Failure; 132 (34.2%)

Bidirectional Approach
Distal Tibial Puncture; 52
Transcollateral; 40

Final Failure; 54 (14.0%)

*; Success rate of BDA
22G Plastic Cannula
Used in Distal Tibial Puncture

Happy Cath 22G
provided by Medickit

Prominent microcatheter (2.6F) can be through this cannula.
Distal Tibial Puncture under DUS-guidance
Long Axis Method

Artery
DUS-Guided Antegrade Wiring for Long ATA CTO
Antegrade Knuckle Wiring for Long ATA CTO
Retrograde Wiring from Distal ATA for Long ATA CTO
Bidirectional Wiring for Long ATA CTO
Summary

• DUS-guidance is useful for wire navigation and distal tibial puncture to treat BTK CTOs.
• Retrograde approach is a powerful method for BTK CTO wiring in case of failed antegrade wiring.
• There still remain some difficulties of DUS-guided wiring; poor images of severe calcified arteries and echo images depending on technician’s skill and equipment performance.
Thank you for your attention!