Complication Management in BTK Procedures

Andrew Holden, MBChB, FRANZCR
Disclosure

Speaker name:
Associate Professor Andrew Holden

I have the following potential conflicts of interest to report:
- Consulting – Clinical Investigator for Shockwave
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

☑️ I do not have any potential conflict of interest
Complication Management in BTK Procedures

- Protecting Tibial Arteries During Proximal Interventions
- Treating Tibial Artery Emboli During Proximal Interventions
- Preventing Complications During Tibial Artery Interventions
- Treating Complications During Tibial Artery Interventions
Complication Management in BTK Procedures

• Protecting Tibial Arteries During Proximal Interventions
• Treating Tibial Artery Emboli During Proximal Interventions
• Preventing Complications During Tibial Artery Interventions
• Treating Complications During Tibial Artery Interventions
Preventing Tibial Artery Embolization

- Identify “at risk” lesions:
  - Acute thrombosis (history, imaging, bypass grafts)
  - Atherectomy, thrombectomy devices
  - Lesion morphology (e.g. ulcerated plaque, non-occlusive thrombus)
  - Compromised distal run off

- Appropriate revascularization strategy:
  - Adequate anticoagulation
  - Primary stenting
  - Covered stents
  - Thrombolysis
  - Embolic protection
Acute onset left leg ischaemia
Complication Management in BTK Procedures

- Protecting Tibial Arteries During Proximal Interventions
- Treating Tibial Artery Emboli During Proximal Interventions
- Preventing Complications During Tibial Artery Interventions
- Treating Complications During Tibial Artery Interventions
Treating Tibial Artery Embolization

- Thrombolysis and aspiration thrombectomy are the 2 main treatment strategies.
- Aspiration thrombectomy should be initially attempted as it is quick and easy and treats athero-emboli that are not lysed.
Complication Management in BTK Procedures

• Protecting Tibial Arteries During Proximal Interventions
• Treating Tibial Artery Emboli During Proximal Interventions
• Preventing Complications During Tibial Artery Interventions
• Treating Complications During Tibial Artery Interventions
Preventing Complications During Tibial Artery Intervention

- Have a carefully planned approach to tibial intervention
- Direct (angiosome-related) versus indirect revascularization

79 year old male, right heel ulcer
RIGHT
Armada 2.5mm x 40mm
2.5mm @ 8atms
Preventing Complications During Tibial Artery Intervention

- Consider revascularization of multiple arteries to minimize the consequences of vessel closure
Preventing Complications During Tibial Artery Intervention

- Maintain intra-procedural anticoagulation (monitor ACT)
- Liberal use of vasodilators
- For angioplasty at arterial bifurcations, maintain safety wire access to prevent acute closure
Preventing Complications During Tibial Artery Intervention

- Be conservative initially with angioplasty balloon sizing
- Easy to upsize a balloon for secondary dilatation
- Arterial rupture/perforation/occlusion due to balloon oversizing is a situation that is difficult to resurrect
Preventing Complications During Tibial Artery Intervention

- Prolonged balloon inflation
- Inflate at low pressures
- Devices with lower rates of arterial dissection – eg Trireme Chocolate balloon?
Complication Management in BTK Procedures

- Protecting Tibial Arteries During Proximal Interventions
- Treating Tibial Artery Emboli During Proximal Interventions
- Preventing Complications During Tibial Artery Interventions
- Treating Complications During Tibial Artery Interventions
In-hospital and 30-day outcomes after tibioperoneal interventions in the US Medicare population with critical limb ischemia

- 13,258 patients with CLI from Medicare database treated with inpatient tibioperoneal angioplasty
- Major complications not limb related
- Renal complications 8.1%, respiratory 5.1%, cardiac 3.2%

In-hospital and 30-day outcomes after tibioperoneal interventions in the US Medicare population with critical limb ischemia

Treating Complications During Tibial Artery Intervention

- Major complications during endovascular tibial intervention include unsuccessful antegrade guidewire crossing, subintimal entrapment, dissection and vessel perforation.
- CTO guidewires and certain crossing devices can assist with antegrade passage in the tibial arteries.
Subintimal Entrapment During Tibial Artery Intervention

- Most of the re-entry devices are too bulky for use in the tibial arteries
- The Covidien Enteer can be used to facilitate antegrade re-entry (2.75mm BTK balloon based system)
Subintimal Entrapment During Tibial Artery Intervention

- Retrograde approach allows successful revascularization in ~90% of failed antegrade crossing or subintimal entrapment
- Ancillary techniques (eg Safari) may be necessary

74 year old male, right heel ulcer. TP trunk angioplasty, failed PTA recanalization
Treating Arterial Dissection Tibial Artery Intervention

- Manage initially with prolonged low pressure balloon angioplasty
- Persistent dissection requires stenting if flow limiting
- Focal lesions – drug eluting BE stents
- Diffuse lesions – SE nitinol stent +/- DCB
Post-angioplasty
**Tack Optimized Balloon Angioplasty (TOBA)** (intact Vascular)

- Minimize stent in artery with localized SE stents (tacks)
- TOBA BTK study – 6mm long SE stents expand to 5.7mm, treat vessels 1.5-4.5mm in diameter
Treating Arterial Perforation During Tibial Artery Intervention

• Potentially serious complication
• Occurred in 5% of patients in BASIL Trial\(^1\)
• Initial management includes prolonged angioplasty, reversal of anticoagulation

• Additional strategies include external compression, proximal arterial occlusion and covered stents (eg Marquet Atrium V12 RX)

1. Lancet 2005;366:1925
Treating Arterial Perforation During Tibial Artery Intervention

- Early surgical consult
- Consider surgical bypass
- Close observation for compartment syndrome – possible fasciotomy

Patients with CLI are at higher risk for complications compared to claudicants (2-6%). In the BASIL trial, complications occurred in 5% of patients. When complications occurred during the procedure, be aware of the consequences of compartment syndrome! Fasciotomy might be needed! Amputation is required in <1% of procedures.
Conclusions

- Important to prevent, recognise and treat tibial artery emboli from proximal interventions
- Good technique is important in tibial intervention to prevent complications
- Effective management strategies for complications are vital
Complication Management in BTK Procedures

Andrew Holden, MBChB, FRANZCR