Femoral artery access & Vascular closure devices: Tips and tricks on reducing and managing complications

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Femoral artery access: Tip 1

• Know the anatomy!

• CFA is the continuation of the External Iliac Artery after the takeoff of the inferior epigastric artery and after crossing the inguinal ligament
Figure 6. Femoral angiogram shows the boundaries of the common femoral artery. Dotted lines mark the inferior epigastric artery, middle of the common femoral artery, and bifurcation of the superficial and profunda branches.
Femoral artery access: Tip 2

- Do not follow groin crease!
Femoral artery access: Tip 2

• Use bony landmarks to guide puncture
• Palpate bony landmarks
Femoral artery access: Tip 3

- Use fluoroscopy to guide in difficult cases
- Bifurcation of the CFA occurs at or below centre of the femoral head in 98.5% of cases
Femoral artery access: Tip 4

- Use ultrasound to guide puncture
- CFA, CFA bifurcation, inferior epigastric artery can be identified
Vascular closure devices

• Why bother? → decrease time to hemostasis, ambulation and discharge

• 3 broad categories of devices

• 1. Active approximators – closing the arteriotomy with sutures or clips

• 2. Passive approximators – deploys plug or gel without active arteriotomy closure

• 3. External hemostatic devices – mechanical pressure at arteriotomy site or promote coagulation with patches / pads
Active approximators

1. Perclose Proglide (6F)
   - Can close 6F to 22F arteriotomies
   - Larger access sites require “preclose” technique

2. Prostar XL (10F)
   - CE mark approval for closing up to 24F arteriotomies

3. StarClose SE
   - Clip based device for 5-8F arteriotomies
Figure 5. ProGlide device. Blood return in the marker lumen indicates that the ProGlide device is in the artery. Then, the “feet” are deployed and the device is withdrawn until the “feet” abut the arterial wall and blood return will stop. The needle plunger is depressed which deploys the needles (a) through the arterial wall and into cuffs on the “feet” (b) which completes the suture loop. The device is then withdrawn and a knot is tied in the suture and pushed down to the arteriotomy site for hemostasis. Image courtesy of Abbott Vascular. © 2010 Abbott Laboratories. All Rights Reserved.
Figure 6. Prostar XL device. Once proper placement is confirmed visually, the right hand rotates and pulls the handle to deploy the needles which are pulled through the arterial wall and collected through the device hub. A knot is tied in each suture and pushed to the arteriotomy site forming two suture loops for hemostasis. Image courtesy of Abbott Vascular. © 2010 Abbott Laboratories. All Rights Reserved.
Figure 4. Starclose device. Click 1, the Starclose device is in the common femoral artery. Click 2, the locator “wings” are deployed. Click 3, the device is withdrawn until the “wings” abut the arterial wall. Click 4, the nitinol clip is deployed which grasps the arteriotomy edges and pulls the vessel wall together to achieve hemostasis. Image courtesy of Abbott Vascular. ©2010 Abbott Laboratories. All Rights Reserved.
Passive approximators

• 1. Angioseal – intravascular resorbable polymer anchor and extravascular collagen plug to sandwich the arteriotomy site

• Once back flow of blood is obtained from the vessel locator aperture, do not advance sheath tip > 2cm into the vessel → may result in premature anchor engagement of the arterial wall proximal to the arteriotomy site

• For use in arteriotomies from 5-8F
Figure 2. Angio-Seal. The Angio-Seal device is inserted until the arteriotomy locator indicates intraluminal position. The anchor is deployed and the device is withdrawn slightly, pulling the anchor against the arterial wall and positioning the collagen plug just outside the artery. The sheath and device are then withdrawn while the tamper tube is used to push the collagen plug gently against the artery wall. Image courtesy of St. Jude Medical.
Passive approximators

- Vascade Vascular closure system (not available in Asia)
- Mynx (not available in Asia)
- Combiclose device (not available in Asia)
- Axera 2 Access device (not available in Asia)
- Cardiva Catalyst II or III (not available in Asia)
Passive approximators

- Exoseal – device introduced through existing sheath
- Deploys an absorbable sealant made of polyglycolic acid over arteriotomy site
- Cannot be used in vessels <5mm or if sheaths are longer than 12cm
External hemostatic devices

• Promote coagulation by concentrating clotting factors
  - Syvek patch
  - D-Stat Dry pad

• Devices that exert manual pressure
  - FemoStop
  - ClampEase
Tips for Proglide

Perclose ProGlide

Now VCD of choice for large sheath closure
- Good device if repeated access is required
- Single Proglide can “preclose” up to 12F
- Larger sheaths will require “preclose” with 2 Proglides
- Dissect connective tissue before deploying Proglide
- Avoid calcified vessels or vessels <6mm
- Tighten knot with guidewire still in the vessel → safety wire
How to reduce vascular closure device complications?

- Operator experience important \(\rightarrow\) misuse of device or device malfunction can lead to severe complications

- Be familiar with 1 or 2 devices

- Some experts recommend avoiding Angioseal in very think patients \(\rightarrow\) plug implantation can result in inflammation and a palpable lump at the skin site

- Avoid vascular closure devices in diseased vessels, non CFA location or small vessels <4mm
How to reduce vascular closure device complications?

• Prevent infections of the deployed device
• Clean and redrape the groin
• Change sterile gloves

• Monitor distal pulses post-procedure

• Be familiar and understand the device!
Thank you