Closure devices: treatment of complications

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Meta-analysis safety VCD

- 31 prospective, randomized studies (7,528 patients)
- Similar results in the study groups in terms of groin hematoma, bleeding, pseudoaneurysm, and blood transfusion
- Lower limb ischemia and other arterial ischemic complications (0.3% vs 0%, \( P = .07 \))
- Need of surgery for vascular complications (0.7% vs 0.4%, \( P = .10 \))
- Groin infection was significantly more frequent with VCDs (0.6% vs 0.2%, \( P = .02 \))
- VCD significantly shorter time to hemostasis

Complications closure devices

- False aneurysm
- Stenosis
- Occlusion
- Dislodgement of endo-luminal component
- Infection
Complications closure devices

- **Stenosis**
  - Entrapment plaque (anchor/suture)
  - Inadequate traction of anchor (intra-luminal foreign body)
  - Suture-induced stenosis
    - Large suture intervals
    - Suturing anterior and posterior wall

- **Laceration**

- **Intra-arterial placement/embolisation of (part of) closure device**
Complications closure devices

- Infection
- Thrombosis
- Periarterial and intra-arterial fibrosis
False aneurysm

Plug mediated device
False aneurysm
False aneurysm - treatment

- External graded compression
- Ultrasound guided thrombin injection
External graded compression
External graded compression
External graded compression
Thrombin injection

Paulson et al, Radiology 2000; 404-408
Thrombin injection
Thrombin injection
Thrombin injection
Stenosis/occlusion-treatment

- PTA (caveat: intra-luminal anchor)
- Surgical repair
Stenosis

Perclose
Stenosis

Perclose
Stenosis

Angioseal
Stenosis

Angioseal
Stenosis

Angioseal
Stenosis

Angioseal
Stenosis
Arterial occlusion

Angioseal

Courtesy JA Vos, MD
Arterial occlusion

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Arterial occlusion

Courtesy JA Vos, MD
Arterial occlusion

Starclose
Arterial occlusion

Starclose
Arterial occlusion
Arterial laceration

Angioseal
Arterial laceration

Angioseal
Distal embolization

Courtesy John Grønvall, MD

Angioseal
Infection

- **Prevention**
  - New drapes, new gloves etc.

- **Treatment**
  - Systemic antibiotics
  - Surgical repair in case of
    - Persistent bacteriemia
    - Symptomatic relapse
    - Abscess formation
    - Hemorrhage and/or pseudoaneurysm formation
Thrombosis

Duett
Thrombosis - treatment

- Surgical thrombectomy
- Catheter-based thrombolysis