Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins

LINC Live case 2017

Prof. Dr. med. Nils Kucher / Bern

Prof. Greg Walker / Boston
Disclosure

Speaker name:
Nils Kucher

☒ I have the following potential conflicts of interest to report:
☒ Consulting/Honoraria: BTG, Optimed, Cook, BSCI, BARD
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)
☐ I do not have any potential conflict of interest
Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins (female, 48 yrs)

Past medical history

- Protein S deficiency and factor V Leiden mutation
- Ongoing anticoagulation therapy
- Recurrent ilio-femoral thrombosis despite medical therapy
- Implantation of permanent Simon™ filter (2004 / USA)
Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins (female, 48 yrs)

Present complaints:
Chronic venous insufficiency both legs with:
- venous claudication
- varicose veins
- hyperpigmentation
- leg swelling

Villalta-Score: 6 points
Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins (female, 48 yrs)

CT scan: Filter struts penetrate infrarenal aorta
Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins (female, 48 yrs)

CT scan: filter tilting with hub against IVC wall
Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins (female, 48 yrs)

Venography: occlusion of IVC and iliac veins
Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins (female, 48 yrs)

Procedural steps:

- General anaesthesia, supine position, urinary catheter
- Venous access with ultrasound guidance in both femoral veins (10F sheath)
- Venous access IJ (26 F Dry seal sheath, Gore)
- Arterial access 6F right CFA
- Filter extraction with endobronchial forceps from IJ access: FORCEPS ALLIGATOR 2.5MMX55CM HARD FOREIGN BODY DOUBLE ACTION (Karl Storz)
- Reconstruction of IVC and iliac veins
- Pre-dilation: Atlas Balloon 14-20mm (Bard)
- Implantation of dedicated IVC and Iliac vein stents:
  - IVC: Sinus XL 22mm (OptiMed),
  - Iliac veins: Sinus-XL Flex 14mm (OptiMed)
- High-pressure post-dilation of stents: Atlas Balloon 14-20 (Bard)
IVC filter retrieval algorithm

1. **Embedded or tilted filter?**
   - No → Standard retrieval technique
   - Yes → Advanced retrieval techniques

2. **Standard retrieval technique**
   - If fail → Tilted, minimally-embedded filter?

3. **Tilted, minimally-embedded filter?**
   - No → Wire loop-and-snare technique
   - Yes → Densely-embedded filter?

4. **Densely-embedded filter?**
   - No → Balloon-assisted or dual-access guidewire and snare technique
   - Yes → Extensively-embedded filter with fibrous tissue?

5. **Extensively-embedded filter with fibrous tissue?**
   - No → Dissection techniques
   - Yes → If fail
Retrieval of embedded filter using endobronchial forceps
Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins: Large retroperitoneal hematoma 1 day post retrieval
Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins:
Residual retroperitoneal hematoma
3 months post retrieval
Case: Reconstruction of the IVC and iliac veins: 3 months post IVC filter retrieval
Case: Reconstruction of the IVC and iliac veins: 3 months post IVC filter retrieval
Endovascular IVC reconstruction with new generation nitinol stents: Patency at 24 months (n = 62)

Primary Patency: 57% (95%CI 50% - 73%)
Assisted Primary Patency: 76% (95% CI 65% - 86%)
Secondary Patency: 87% (95%CI 80% - 95%)

Endovascular IVC reconstruction: Patency at 24 months
Distal stent landing zones

Stents above ligament: 64% (95% CI 54% - 85%)
Stents below ligament: 55% (95% CI 36% - 69%)

Log-rank (Mantel-Cox)
p = 0.42

Endovascular IVC reconstruction: 
Patency at 24 months 
Postthrombotic leg inflow veins

Normal inflow: 70% (95%CI 54% - 85%)
Postthrombotic inflow: 46% (95%CI 36% - 69%)

Log-rank (Mantel-Cox)
p = 0.13

Venous Intervention

Acute DVT treatment
Catheter-directed thrombolysis
+/- Stenting

Chronic DVT treatment (PTS)
Endovascular reconstruction
Stenting

nilskucher.com
Case: Removal of tilted IVC filter (aortic penetration) and reconstruction of the IVC and iliac veins

LINC Live case 2017

Prof. Dr. med. Nils Kucher / Bern

Prof. Greg Walker / Boston