Endovascular Management of IVC occlusion

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Disclosure

Speaker name: 

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
IVC occlusion

Incidence and causes

- IVC occlusion is between 4 to 15% of patients with LE DVT
- Most common cause is primary thrombotic event such as DVT
- Other causes include tumor growth, compression and Injury
- Most common iatrogenic cause is IVC filter not retrieved

Symptoms

- Fatigue, dizziness, abdominal pain, night sweats, anorexia, palpitations, diaphoresis, dizziness, shortness of breath on exertion.
- Postural hypotension
- Tiredness and heaviness of Bilateral legs
- Near syncope
Work up

- R/o congenital issues
- Check previous procedures: Ligation, filters/stents
- H/o DVT or upper, lower and pelvis, H/o of PE
- R/o hypercoagulable diseases: APS, Budd Chiari, malignancy etc
- ECHO
- Ilio-caval duplex
- CTV and or MRV(TOF)
- Right heart catheterization
- Cardiopulmonary Exercise test
- Ilio-caval venogram
How to confirm symptoms of IVC occlusion

• RHC: Symptoms of IVC occlusion and clinical findings
• low RA pressures normal PA pressures wedge <14
• Invasive cardiopulmonary testing to check for preload insufficiency
• Right heart cath with exercise: Failure of RA/PA/PCWP to rise with increasing workloads and increased CO
• Blunted stroke volume response due to impaired venous return
• Best tested with upright exercise ergometer
• Saline loading and repeat iCPET to r/.o hypovolemia
• Beware of differential diagnosis such as valvular obstruction and HCM
Data from Icpet

Endovascular Recanalization of Symptomatic Chronic Inferior Vena Cava Occlusions: 
Largest case series from Dr. Raju

Study Period: November 2000 - August 2015
• Total Patients: 71 (58% men)
• Average Age: 51 years (Range: 23-77 years)
• Contributing Factors for Venous Occlusion:
  • IVC filter occlusion: 54% (n = 38)
  • Caval ligation/clipping: 6% (n = 4)
  • Hypercoagulable disorder: 38% (n = 27)
• Technical Success Rate: 85% (n = 60)
• Proximal Stent Placement:
  • Infrarenal: 67% (n = 40)
  • Suprarenal: 18% (n = 11)
  • Intrathoracic: 15% (n = 9)
• Perioperative Morbidity:
  • Minimal cases:
    • Hematomas: 2 and Renal failure: 1
  • Postoperative Mortality: None
  • Average Follow-up: 48.0 ± 43.3 months (Range: 6-172 months)
  • Patency Rates at 60 Months: Primary: 52%, Primary Assisted: 85%, Secondary: 93%
• Symptom Improvement:
  • Pain: 91% showed significant improvement
  • Swelling: 83% showed significant improvement
• Complete Cumulative Relief:
  • Pain: 66% and Swelling: 41%
• Ulcers in 18 patients
  • 78% (n = 14) experienced complete healing without recurrence after recanalization
Case: 64 year male with G2 filter for 12 years not removed has leg swelling, fatigue difficulty in ambulation.
Cross with Triforce (Cook), confirm with IVUS than conquest balloon 10 x 40mm
Balloon ilio-caval segment and across the filter
May need a biopsy forceps to free the tip of the filter from fibrous tissue, use telescope with 18 French sheath and laser to collapse the filter
IVUS sizing after filter removal
One 20 x 60 Abre in distal IVC below renal and bilateral iliac with 14 x 150 Abre stents

- Use IVUS to size and pre dilate
- Post dilate with 12 to 14 mm
- Extend beyond femoral head
Case

• Patient with Trapease filter placed 17 years ago
• Patient presents with leg swelling, abdominal distension, dizziness, leg heaviness and fatigue
• CT imaging showed occluded IVC with calcification of thrombus inside the filter
• Baseline venogram showed occluded venacava filter
The IVC filter was crushed with 16mm balloon and stents placed
Post ilio caval balloon dilation

- If stenosis only can try DEB
- If occluded needs stenting
- One large stent based on IVUS in IVC and 2 self expanding iliac stents
- 2 large 14 mm long stents self expanding
- Extend across the femoral head if needed
- Avoid overlap across the inguinal ligament
Final angiogram after 2 x 16 Abre stents

- Patient did have significant back pain due to oversized stents
- CT showed small RP blood
- Treated with NSAID and solumedrol pack
Complications

- IVC linear tear
- Chronic persistent back pain
- Recurrent ilocaval stent thrombosis
- Embolization of stent or clot
Future

• Dedicated “IVC stents” Clinical trial by GORE in progress
• Standardized anticoagulation regimen peri and post procedure
• Dedicated bifurcated self expanding stents for ilio-caval veins
• Timely removal of filter to avoid IVC occlusion