Case Presentation – Shortness of Breath after DVT/PE

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Disclosures

Speaker’s Bureau:
• Medtronic

Consultant:
• Medtronic

Site Principal Investigator:
Cook Vena
Bard Vernacular

Medical/Scientific Boards:
• NCDR Research and Publications Committee
Background

- 41-year-old woman underwent neck fusion surgery.
- L leg DVT 3 days later.
- Anticoagulation relatively contra-indicated.
- IVC filter placed.
- Developed PE within another 2 days (no hemodynamic compromise).
- Anti-coagulation commenced.
- CT study: bilateral iliac vein thrombosis.
8 months later

- Referred for removal of IVC filter and evaluation of exertional dyspnea.
- L leg aching with standing, mild bilat leg edema.
- Wore compression stockings.
- CT venography: bilateral common iliac vein occlusion extending into the iliac confluence.
Patient Symptoms

- Since DVT / PE: marked exertional dyspnea and exercise intolerance.
- Prior, could use the treadmill.
- Walking upstairs made her feel as if "she was going to die".
- Resting heart rates 90-100, would rise to 190 within 30 secs of walking.
Physical Exam

• Mostly unremarkable.
• Resting heart rate 94 bpm
• Body mass index 27 kg/m².
• No murmurs, clear lungs.
• Trace edema around both ankles.
Testing

To rule out CTEPH, V/Q scan obtained: no perfusion defects or mismatch.

CT angiogram: no residual pulmonary artery thrombus.

ECHO: Normal systolic and diastolic function, no valvulopathy and right ventricular systolic pressure of 25mmHg (normal).

Right heart catheterization: normal right (3mmHg) and left-sided (10mmHg) pressures, mean pulmonary artery pressure 18mmHg (normal).

Exercise treadmill testing revealed no ischemia.

PFT: unremarkable.

A six-minute walk test: 360 meters (61% of the expected), Borg Dyspnea Scale 5 (severe dyspnea).
Deconditioning?

- Symptoms did not improve despite attempts to exercise and increase her cardiovascular endurance.
? Preload Insufficiency.

- Bilateral iliac vein occlusion.
- Adequate venous return to the right ventricle was being compromised.
Intervention Part 1

2 prior IVC filter retrieval failures. IVC filter retrieval (Cook device) RIJ access.
Intervention Part 2
2-week Follow-up

- Dramatic improvement of exertional dyspnea
- Reduced bilateral leg edema.
- She began to go to the gym again.
- During a repeat six-minute walk 3 weeks post-procedure: 449 m (76% of expected), improvement compared to 360 m.
- Borg Dyspnea Scale improved from 5 (severe) to 2 (slight).

- Appeared to confirm diagnosis of exertional dyspnea from preload insufficiency due to iliac vein occlusion.
Unexplained exertional dyspnea caused by low ventricular filling pressures: results from clinical invasive cardiopulmonary exercise testing

- n=49 patients with unexplained exercise intolerance.
- Low \( V' O_2 \text{max} \) due to inadequate peak cardiac output.
- Normal biventricular EF, normal PA pressure.
- This group had lower R and L-sided filling pressures and less Stroke Volume augmentation at peak exercise (despite iv fluid).
- Mechanism: ? Inadequate venoconstriction

Postural orthostatic tachycardia syndrome (POTS)

- POTS: due to inadequate peripheral venoconstriction or sympathetic dysautonomia.
- N=27 patients diagnosed with POTS: lower Stroke Volume and cardiac output.
- Baroreflex and autonomic function intact.
- Another study in exaggerated HR response: RBC venous pooling.

Thank You
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