Pelvic Congestion Syndrome, Venous Compression Syndromes

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Scarborough Vascular Ultrasound
Toronto Vascular Ultrasound
Scarborough Hospital-General Site
Topics

- Pelvic Congestion Syndrome
- Venous compression syndromes:
  - Nutcracker Syndrome
  - Iliofemoral Compression Syndrome (May-Thurners)
Pelvic Congestion Syndrome

- Condition of visceral venous insufficiency
- Retrograde flow in the ovarian veins with engorgement and distension of the deep pelvic venous structures causing chronic pain
- Female equivalent of male varicocele
- Likely under-diagnosed clinical entity
Chronic pelvic pain

- Common presenting complaint in 40% patients seen in outpatient gynecological clinics
- 15% of women of childbearing age
- 15% of hysterectomies
- 35% of diagnostic laparoscopies
- Source of ongoing morbidity, depression, and stress for patients
PCS: Clinical features

- Chronic pelvic pain of > 6 months duration
  - Unilateral or bilateral
  - Heaviness, achy quality
  - Positional rather than cyclical
  - Worse with standing or sitting, better supine
  - Ovarian point tenderness
- Dyspareunia or post-coital discomfort (often prolonged)
- Family or personal history of lower extremity varicose veins
- Source of vulvar, buttock, or inner thigh varicose veins
PCS: Clinical features

- Can be multiparous or nulliparous
- Can exist post TAH-BSO
PCS: Etiology

- Mechanical factors:
  - Congenital absence/deficiency of ovarian vein valves
  - Post-pregnancy valvular insufficiency:
    - Dilatation of the ovarian veins (up to 60-fold increased capacity) during pregnancy resulting in valvular incompetence and retrograde venous flow
  - Nutcracker syndrome: central left RV compression
PCS: Etiology

- Hormonal factors:
  - Sx worsen with hyperestrogenic states (premenstrual, estrogen replacement Rx)
  - Sx tend to abate post menopause
Evaluation

- Cross-sectional imaging:
  - CT, MRV, Ultrasound
  - Visualize the ovarian and deep pelvic veins
  - Rule out other possible pathologies
    - Endometriosis/adenomyosis
    - Bladder or bowel
    - Primary ovarian pathology
- Laparoscopy
- Tilt table gonadal and hypogastric venography
US appearance

dilated vein

crossing midline
PCS: CT appearance
Pelvic varices: MRV appearance
Vulvar and Lower Extremity Varicosities
MRV/venogram correlation
PCS: Venographic criteria

- Left renal venography showing retrograde flow in ovarian vein with tilt table study or valsalva maneuver
- Ovarian vein diameter > 1 cm
- Cross-pelvic collateral filling
Gonadal vein anatomy

- Often multiple channels
- Inflow from ovarian/pampiform plexes
- Extensive collateralization
  - Paravertebral veins
  - Ureteric veins
  - Renal capsular veins

Embolize entire OV to avoid collateral reconstitution and recurrence
Gonadal vein anatomy

Testicular Vein

Spermatic Veins

OV
Collateral reconstitution of reflux
**PCS: Treatment**

- **Medical:**
  - Short-term benefits in 50%
  - NSAIDS
  - Medroxyprogesterone acetate
- **Surgical**
  - Ovarian vein ligation: open or laparoscopic
  - TAH-BSO
PCS: Treatment

• Transcatheter Image guided endovenous embolization
  – Part 1: Ovarian veins
  – Part 2: Hypogastric veins
PCS: Embolization technique

- Ovarian vein embo
- Internal iliac vein embo
PCS: Embolization technique

- Selective catheterization of ovarian vein:
  - Jugular or femoral approach
  - Start with left side
  - Catheterize ovarian vein to pelvic brim
- Selective ovarian vein injection:
  - Document pelvic varices and cross pelvic venous filling
OV: Embolization technique

- Embolization of the ovarian vein from pelvic brim to 1-2 cm below terminus at renal vein
- Embolic agents:
  - Coils
  - Glue
  - Sclerosants:
    - Sodium tetradecyl sulfate 3%
    - Sodium Morrhuate 5%
  - Combined with gelfoam slurry or coils.
PCS: post OV coiling
Hypogastric veins: Embolization technique

- Balloon occlusion venography and sclerotherapy of the hypogastric veins.
  - Avoid coils in hypogastric distribution: Migration to lungs
  - Glue
  - Sclerotherapy
Hypogastic venogram
Post-Procedure Instructions

- Post-procedural NSAIDs to minimize phlebitis
- Same day discharge home
  - More pain with chemical sclerotherapy of gonadal veins than coils embo alone
    - May require admission overnight
PCS variant: Nutcracker syndrome

- Mechanical impingement of central left renal vein between aorta and SMA
- Posterior Nutcracker = impingement of retroaortic renal vein between aorta and spine
- Left RV outflow obstruction with venous hypertension (4-14 mm Hg gradient)
- Compensatory gonadal vein reflux and PCS
PCS variant: Nutcracker syndrome

Hartung et al. JVS 2005; 42(2):275-280
Nutcracker syndrome: Clinical

- Hematuria
- Flank pain
- Typical sequelae of PCS in females
  - Buttock and vulvar varicosities
  - Pelvic pain
  - Dyspareunia
- Varicocele in males
Nutcracker syndrome: Rx

- Surgical
  - Autotransplantation
  - External stenting: Ringed PTFE cuff around LRV
  - Gonadocaval bypass
  - Transposition of left RV
  - Nephrectomy
- Endovascular stenting
PCS: Outcomes

Kim et al. JVIR 2006; 17:289-297

- N = 127 with PCS
  - 127 (100%) endovenous embolization
  - 108 (85%) internal iliac foam sclerotherapy
  - Mean age 34 (±12.5)
  - Mean duration of follow-up 45 months (±18)
- Prospective assessment by visual analog pain scale at baseline, 3/6/12 months, and annually thereafter
- FSH levels at baseline and follow-up
### Outcomes

Kim et al. JVIR 2006; 17:289-297

<table>
<thead>
<tr>
<th>Mean Sx Severity Score</th>
<th>Pre embo</th>
<th>Post embo</th>
<th>P value</th>
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<tbody>
<tr>
<td>Overall Pain level</td>
<td>7.6</td>
<td>2.9</td>
<td>&lt;0.00001</td>
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<tr>
<td>Pain on standing</td>
<td>7.8</td>
<td>3.2</td>
<td>&lt;0.00001</td>
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<tr>
<td>Pain supine</td>
<td>5.5</td>
<td>2.2</td>
<td>&lt;0.00001</td>
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<td>Dyspareunia</td>
<td>3.3</td>
<td>1.5</td>
<td>&lt;0.00001</td>
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<td>Urinary frequency</td>
<td>3.5</td>
<td>2.0</td>
<td>0.0001</td>
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<tr>
<td>Menstrual pain</td>
<td>4.9</td>
<td>2.2</td>
<td>&lt;0.00001</td>
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<tr>
<td>Pain medications used</td>
<td>1.6</td>
<td>0.9</td>
<td>0.00001</td>
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</table>
Outcomes

• Kim et al. JVIR 2006; 17:289-297

• No hormonal changes

• Similar statistically significant pain reduction on post-TAH/BSO subjects as well.
# Outcomes: overall

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Significant relief</th>
<th>Partial relief</th>
<th>No relief</th>
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<tbody>
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<td>Edwards et al. 1993</td>
<td>1</td>
<td>100%</td>
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<td>Sichlau et al. 1994</td>
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<td>100%</td>
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<tr>
<td>Tarazov et al. 1997</td>
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<td>67%</td>
<td>33%</td>
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<td>Capasso et al. 1997</td>
<td>19</td>
<td>58%</td>
<td>16%</td>
<td>26%</td>
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<tr>
<td>Cordts et al. 1998</td>
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<td>67%</td>
<td>22%</td>
<td>11%</td>
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<tr>
<td>Maleux et al. 2000</td>
<td>41</td>
<td>58%</td>
<td>10%</td>
<td>32%</td>
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<tr>
<td>Venbrux et al. 2002</td>
<td>56</td>
<td>96%</td>
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<td>4%</td>
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<tr>
<td>Pieri et al. 2003</td>
<td>33</td>
<td>100%</td>
<td></td>
<td></td>
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<tr>
<td>Bachar et al. 2003</td>
<td>6</td>
<td>50%</td>
<td>33%</td>
<td>17%</td>
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</table>
Venous compression syndromes
May-Thurner Syndrome

- Chronic impingement of left CIV by right CIA
- Intraluminal spur and web formation
- Females > Males
- Chronic iliac vein obstruction
  - Leg edema
  - Pain
  - DVT and PTS
- Responds well to thrombolysis and stenting
May-Thurner Syndrome
Prone left: Extensive iliofemoral clot
May-Thurner

Angiojet and balloon mechanical disruption
May-Thurner

After 12 hours catheter directed TPA: persistent clot at iliac confluence.
May-Thurner

Post 24 hour thrombolysis and stenting
Management Algorithm

- Suspect patient with PCS or a compression syndrome
- Refer to an Interventional Radiologist
  - Clinical Consult
  - Appropriate MRI or CT
    - Venous or Arterial MRA/MRV, CTA/CTV
  - Determine appropriate treatment plan
  - Endovenous/Endovascular
    - Day Procedure/Overnight Stay
Summary: PCS

- Under diagnosed cause of chronic pelvic pain and recurrent/refractory vulvar and lower extremity varicose veins
- Ovarian vein and hypogastric vein embolization minimally invasive, low risk, outpatient treatment
- 70-100% positive clinical response to treatment
- *Hopefully, you have a helpful Interventional Radiologist in your area!*