Chronic Pelvic Pain in Women: Assessment, Diagnosis, Innovative Treatments

Pelvic Congestion Syndrome

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Royal Oak, MI
Disclosures

None
Introduction

• Chronic Pelvic Pain Definition
  – Noncyclic pain > 6 months
  – Pelvis
  – Functional disability
  – Leads to medical care
Introduction

• Chronic Pelvic Pain
  – 3.8-24% prevalence
  – 38/1000 incidence
  – 10% Gynecologic referrals
  – 12% Hysterectomies
  – 40% Laparoscopies
Introduction

• Chronic Pelvic Pain Socioeconomic Cost
  – $880 million/year patient
  – $2 billion/year total
  – $15 billion/year lost productivity
# Introduction

## Chronic Pelvic Pain Differential Diagnosis

<table>
<thead>
<tr>
<th>Gynecology</th>
<th>Gastroenterology</th>
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<tr>
<td>Endometriosis</td>
<td>Irritable bowel syndrome</td>
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<tr>
<td>Chronic pelvic inflammatory disease</td>
<td>Inflammatory bowel disease</td>
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<tr>
<td>Pelvic varicosities (pelvic congestion syndrome)</td>
<td>Diverticular disease</td>
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<td>Fibroids</td>
<td>Chronic constipation</td>
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<td>Ovarian cysts</td>
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<td>Cancer or metastases</td>
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<td>Porphyria</td>
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<td>Interstitial cystitis</td>
<td>Pelvic floor myalgia</td>
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<td>Recurrent urinary tract infections</td>
<td>Myofascial pain (trigger points)</td>
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<td>Urethral diverticulum</td>
<td>Piriformis syndrome</td>
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<td>Neuralgia of ilioinguinal, genitofemoral, or pudendal nerves</td>
<td>Sacroiliac joint inflammation</td>
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<td>Neuropathic pain</td>
<td>Hip joint pathology</td>
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<td>Herniated nucleus pulposus</td>
<td>Fractured coccyx</td>
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<td>Abdominal epilepsy/migraine</td>
<td>Fibromyalgia</td>
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Pelvic Congestion Syndrome

- Incidence/Prevalence difficult to establish
- Prevalence up to 30% in patients with CPP and no other known cause.
Historical perspective

- 1831 Gooch first description
- 1857 Richet describes “tubo-ovarian varicocele”
- 1920’s Cotte links CPP with ovarian varices
- 1949 Taylor describes “vascular disturbance” due to autonomic nervous system imbalance
- 1984 Beard seminal paper
1984 Beard seminal paper

• Transuterine venogram
  – 8 Asymptomatic
  – 10 Diagnosis by laparascopy
  – 45 Symptomatic / negative laparoscopy

• Venographically dilated pelvic veins correlated with last group
Pelvic Congestion Syndrome

- Normal Venous Anatomy
  - Valves promote one way flow
Pelvic Congestion Syndrome

• Normal Venous Anatomy
  – Iliac veins
  – IVC
  – Renal veins
Pelvic Congestion Syndrome

- Normal Venous Anatomy
  - Gonadal veins
  - Uterine venous plexus
Pelvic Congestion Syndrome

• Normal Venous Anatomy
  – Gonadal veins
    • Left to Renal vein
      – Right angle
        » Facilitates reflux
        » More hydrostatic pressure
    • Right to IVC
Pelvic Congestion Syndrome

- Normal Venous Anatomy
- 2 overlapping venous territories
Venous Disease
Pathogenic Mechanism

• Reflux
• Risk factors
• Etiology of pain
Reflux

- Reflux through incompetent valves appears to be the major defect.
- Exact mechanism poorly defined
Reflux

- Valve structure abnormality
  - Leak
  - Progressive reflux
  - Venous dilation
  OR

- Vein wall abnormality
  - Dilated vein
  - Valve dysfunction/leak
Risk factors

• Environmental
• Anatomic
• Genetic
Risk factors

• Environmental
  – Pregnancy
  – Pelvic surgery
  – Estrogen exposure
  – Obesity
  – Phlebitis
  – Prolonged standing/heavy lifting
Risk factors

• Environmental
  – Pregnancy
    • Vein capacity increases up to 60%
    • Mechanical compression
    • Progesterone
    • Veins may remain enlarged for 6 months
    • Progressive
Risk factors

• Environmental
  – Estrogen
    • Weakens veins
    • Venous dilation via nitric oxide release
    • Polycystic ovaries
Risk factors

• Anatomic
  – Anomalies
    • Absent valves
      – 15% ovarian
      – 90% internal iliac
    • Incompetent valves
      – 40% left ovarian
      – 35% right ovarian
Risk factors

• Anatomic
  – Compression leading to mechanical outflow obstruction
  – Nutcracker syndrome
  – May-Thurner
  – IVC thrombus

• Mass
  • Endometriosis
  • Fibroids
  • Hypervascular mass
    – obstruction
    – increase venous return

• Adhesions
Risk factors

• Genetic
  – Not yet established
  – Some genes have an association
  – Reports of familial clustering
Venous reflux is the underlying defect.

- Analogous to varicose veins elsewhere
- Multifactorial
  - Environmental
  - Anatomic
  - Genetic
- Pregnancy
  - Hormonal
  - Mechanical
Etiology of Pain

- Pelvic congestion is not just pelvic varices.
- There must be pain too.
Etiology of Pain

• Venous distention does not universally cause pain.
• Stretch and stasis > pain receptors
• Gabapentin, amitriptyline*

Etiology of Pain

• 2005 Ascuitto et al, reported higher pain levels in women with:
  – Pelvic varices and LE varicose veins
  – Isolated LE varicose veins
Etiology of Pain

- Neurotransmitters
  - Substance P
  - CGRP (calcitonin gene-related peptide)
  - Adenosine triphosphate
  - Endothelin
  - Vasopressin
  - Nitric oxide
- MPA (medroxyprogesterone acetate)
Etiology of Pain

- Venous dilation > inflammation
Incidental Findings

• 2002, Nascimento et al.
• MRA in 22 asymptomatic female kidney donors
• 38% showed reflux
• None were found to have symptoms by chart review
Incidental Findings

- 2001, Rozenblit et al.
- 34 CTA asymptomatic female kidney donors
- 47% (16/34) showed dilated left ovarian veins
Incidental Findings

- 2002 Belenky et al.
- 273 preoperative aortograms in asymptomatic female kidney donors
- 27 were noted to have reflux left ovarian vein
- In retrospect, 59% (13/22) found to have symptoms but sought no treatment.
- All underwent nephrectomy with ligation of left ovarian vein.
- Post nephrectomy symptom resolution
  - 7 complete
  - 3 partial
  - 3 no change
Diagnosis

- No set diagnostic criteria
- Diagnosis of exclusion
- Pelvic varices + CPP with appropriate history
Evaluation

- Clinical
- Imaging
- Laparoscopy
History
History
History

- Premenopausal (20’s and 30’s)
- Multiparous
- Deep dull ache pelvis, vulva, thighs
- Dyspareunia
- Postcoital pain
History

• Exacerbation by walking, prolonged standing, heavy lifting, bearing down, menstruation, pregnancy
• Worse at end of day
• Improved in morning
History

• Less common-
  – progressive hip pain
  – LE varicose veins +- recurrence
  – persistent genital arousal
History

- Nonspecific complaints-
  - HA, bloating, nausea,
  - discharge, vulval swelling
  - leg fullness, backache, rectal pain
  - urinary urgency
  - lethargy, depression
• Seen many physicians by the time they get to IR.
• Often desperate
  – Ethical concerns
  – Realistic expectations
History

- Long association of emotional/psychological issues.
- Increasingly accepted that PCS/CPP is the cause of these symptoms.
Physical exam

- Ovarian point tenderness
  - Ovarian point tenderness + postcoital pain
  - Vulvar, gluteal, perineal varicose veins
Physical exam

- Vulval and upper thigh varices.
Imaging

- US
- CT
- MRI
- Venogram
US

- First line
- TV preferred
- TA allows evaluation while standing
- Normal
  - 1-2 straight veins < 5 mm
US

- First line
- TV preferred
- TA allows evaluation while standing
- Normal
  - 1-2 straight veins < 5 mm
  - Caudocranial flow
• Abnormal
  – Multiple, tortuous >6 mm
• Abnormal
  – Multiple, tortuous >6 mm
  – Slowed or reversed flow
• Abnormal
  – Multiple, tortuous >6 mm
  – Slowed or reversed flow
  – Valsalva
    • Flow reversal
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• Abnormal
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  – Polycystic ovaries
• Abnormal
  – Multiple tortuous veins > 6 mm
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CT/MRI

• Dilated tubular tortuous structures.
• Coexisting/alternate pathology
• Diagnostic criteria
  – Ovarian vein > 8 mm
  or
  – At least 4 ipsilateral pelvic veins
  – At least one > 4 mm

• Limited by supine positioning
• Subjective
CT
Compression - Mass
Compression - Mass
Compression - Mass
Compression- Nutcracker

Normal

Nutcracker
Compression - Nutcracker
MRI
Laparoscopy

- Useful for other conditions
- Limited value for varices due to
  - Supine
  - CO₂ insufflation increases intraperitoneal pressure
  - Compress/conceal varices
Treatment

- Medical
- Surgical
- Transcatheter Embolization
Medical

• Analgesia
  – nsaid, opiates

• Hormonal options
  – MPA 30 mg/day PO x 6 months
  – Goserilin (GnRH agonist) 3.6 mg/month SC x 6 months

• Short term relief but long term effectiveness not proven
Medical

• Side effects
  – Weight gain
  – Hot flashes
  – Bone loss
  – Mood changes

• Can be offset by estrogen “add back” therapy
Surgical

• Hysterectomy and oopherectomy
  – Suggested as a last resort
  – Not always curative
    • 1/3 residual
    • 1/5 recur
  – Surgical risks
Transcatheter Embolization

- Outpatient
- Conscious sedation
- Antibiotics
- Single session or staged
  - Ovarians
  - Iliacs
- Femoral or Jugular vein approach
- Various catheter types and combinations
Transcatheter Embolization

- Left renal venography
Transcatheter Embolization

- Left gonadal venography
Transcatheter Embolization

- Embolization
  - Sclerosant
    - Sodium Tetradecyl Sulfate
    - Sodium Morrhuate
    - Glue
Transcatheter Embolization

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- Embolization
  - Coils
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Transcatheter Embolization

• Embolization
  – Plugs
Transcatheter Embolization

- Embolization
  - Plugs
Transcatheter Embolization

- Post embolization venogram
Transcatheter Embolization

• Similar process
  – Right ovarian
Transcatheter Embolization

• Similar process
  – Right ovarian
Transcatheter Embolization

- Similar process
  - Right ovarian
Transcatheter Embolization

• Similar process
  – Bilateral iliacs
    • No coils
Post procedure care

• 2-4 observation
• Post embolization syndrome
  – Pain
  – Fever
  – Nausea
• IR clinic in 4-6 weeks
Complications

Coil migration
Complications
Complications
Complications

- Vessel perforation/injury
- Local phlebitis
- Venography related
  - Contrast
  - DVT
  - Radiation exposure
Complications

- Technical success-96-100%
- No reports of menstrual or fertility changes
## Outcomes

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<td></td>
<td></td>
<td></td>
<td></td>
<td>No relief: 4%</td>
</tr>
<tr>
<td>Chung and Huh, 2003</td>
<td>52</td>
<td>Bilateral ovarian</td>
<td>Coils</td>
<td>6–12</td>
<td>Significant relief: 100%</td>
</tr>
<tr>
<td>Kim et al, 2006</td>
<td>127</td>
<td>106 bilateral ovarian + 95 internal iliac, 20 unilateral ovarian + 13 internal iliac</td>
<td>Coil + sclerosant</td>
<td>45</td>
<td>Improved: 83%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unchanged: 13%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Worsened: 4%</td>
</tr>
<tr>
<td>Kwon et al, 2007</td>
<td>67</td>
<td>64 left ovarian, 1 right ovarian, 2 bilateral ovarian</td>
<td>Coils</td>
<td>44.8</td>
<td>Improved: 82%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No relief: 15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Worsened: 3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total relief: 64%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Partial relief: 29%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No relief: 7%</td>
</tr>
<tr>
<td>Monedero et al, 2012</td>
<td>100</td>
<td>NA</td>
<td>NA</td>
<td>14</td>
<td>Improved: 93%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unchanged: 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Worsened: 1%</td>
</tr>
<tr>
<td>Laborda et al, 2013</td>
<td>202</td>
<td>Bilateral ovarian + bilateral hypogastric</td>
<td>Coils</td>
<td>60</td>
<td>Improved: 93%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unchanged: 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Worsened: 1%</td>
</tr>
</tbody>
</table>

NA = not available; PCS = pelvic congestion syndrome.
## Outcomes

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>n</th>
<th>Mean follow up (months)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>Venbrux et al</td>
<td>56</td>
<td>22.1</td>
<td>Significant/partial relief 96%</td>
</tr>
<tr>
<td>2003</td>
<td>Chung and Huh</td>
<td>52</td>
<td>6-12</td>
<td>Significant relief 100%</td>
</tr>
<tr>
<td>2006</td>
<td>Kim et al</td>
<td>127</td>
<td>45</td>
<td>82% improved</td>
</tr>
<tr>
<td>2013</td>
<td>Laborda et al</td>
<td>202</td>
<td>60</td>
<td>93% improved</td>
</tr>
<tr>
<td>2014</td>
<td>Hocquelet et al</td>
<td>33</td>
<td>26</td>
<td>61% complete relief 33% partial relief</td>
</tr>
<tr>
<td>2014</td>
<td>Nasser et al</td>
<td>113</td>
<td>12</td>
<td>53% no pain 47% reduced pain</td>
</tr>
</tbody>
</table>
The care of patients with varicose veins and associated chronic venous diseases: Clinical practice guidelines of the Society for Vascular Surgery and the American Venous Forum

Peter Gloviczki, MD, Anthony J. Comerota, MD, Michael C. Dalstra, MD, Bo G. Esko, MD, David L. Gillespie, MD, Monika L. Gloviczki, PhD, Joann M. Lohr, MD, Robert E. McLaughney, MD, Mark H. Meissner, MD, Hassan Murad, MD, MPH, Frank T. Pabst, MD, Peter J. Pappas, MD, Marc A. Pasmans, MD, Joseph D. Rafetto, MD, Michael A. Vasquez, MD, RVT, and Thomas W. Wakefield, MD. Rockcutter, Lima Toledo, Ohio; Indianapolis, Ind; Helsingborg, Sweden; Rochester, NY; Cincinatti, Ohio; Springfield, Ill; Livonia, Mich; West Hollywood, Calif; Edmonton, Alberta; North Vancouver, Vic, and Ann Arbor, Mich.

The Society for Vascular Surgery (SVS) and the American Venous Forum (AVF) have developed clinical practice guidelines for the care of patients with various forms of lower extremity and pelvic veins. The document also includes recommendations on the management of superficial and prevailing venous incompetence in patients with associated, more advanced chronic venous diseases (CVDs), including edema, skin changes, or venous ulcers. Recommendations of the Venous Guideline Committee are based on the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system as strong (GRADE 1) if the benefits clearly outweigh the risks, burden, and costs. The suggestions are weak (GRADE 2) if the benefits are closely balanced with risks and burden. The level of available evidence is supported by the evaluation of treatment can be of high (A), medium (B), or low or very low (C) quality. The key recommendations of these guidelines are: we recommend that in patients with varicose veins or more severe CVD, a complete history and detailed physical examination are complemented by duplex ultrasound scanning of the deep and superficial veins (GRADE 1A). We recommend that the CEAP classification is used for patients with CVD (GRADE 1A) and that the revised Venous Clinical Severity Score is used to assess treatment outcome (GRADE 1B). We suggest compression therapy for patients with symptomatic varicose veins (GRADE 3C) but recommend against compression therapy as the primary treatment if the patient is a candidate for surgical vein ablation (GRADE 1B). We recommend compression therapy as the primary treatment to aid healing of venous ulceration (GRADE 1B). To decrease the recurrence of venous ulcers, we recommend ablation of the incompetent superficial veins in addition to compression therapy (GRADE 1A). For treatment of the incompetent great saphenous vein (GSV), we recommend endovenous thermal ablation (radiofrequency or laser) rather than high-ligation and inversion stripping of the saphenous vein to the level of the knee (GRADE 1B). We recommend phlebectomy or sclerotherapy to treat varicose tributaries (GRADE 1B) and suggest foam sclerotherapy as an option for the treatment of incompetent saphenous vein (GRADE 2C). We recommend against selective treatment of perforating vein incompetence in patients with simple varicose veins (CEAP class C2; GRADE 1B), but we suggest treatment of pathologic perforating veins (outward flow duration ≥500 ms, with diameter ≥3.5 mm) located underneath healed or active ulcers (CEAP class C2,3 or GRADE 2B). We suggest treatment of pelvic congestion syndrome and pelvic varices with coil embolization, plugs, or transcatheter sclerotherapy, used alone or together (GRADE 2B). (J Vasc Surg 2011;53:25–48.)
### Guideline 14. Treatment of pelvic varicose veins

<table>
<thead>
<tr>
<th>Guideline No.</th>
<th>Grade of recommendation</th>
<th>Level of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1</td>
<td>1. Strong</td>
<td>A. High quality</td>
</tr>
<tr>
<td></td>
<td>2. Weak</td>
<td>B. Moderate quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C. Low or very low quality</td>
</tr>
</tbody>
</table>

**14.1** We recommend noninvasive imaging with transabdominal and/or transvaginal ultrasonography, computed tomography or magnetic resonance venography in selected patients with symptoms of pelvic congestion syndrome or symptomatic varices in the distribution of the pubis, labia, perineum, or buttocks.

<table>
<thead>
<tr>
<th>14.2</th>
<th>Grade</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>C</td>
</tr>
</tbody>
</table>

**14.2** We recommend retrograde ovarian and internal iliac venography in patients with pelvic venous disease, confirmed or suspected by noninvasive imaging studies, in whom intervention is planned.

<table>
<thead>
<tr>
<th>14.3</th>
<th>Grade</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>B</td>
</tr>
</tbody>
</table>

**14.3** We suggest treatment of pelvic congestion syndrome and pelvic varices with coil embolization, plugs, or transcatheter sclerotherapy, used alone or together.

<table>
<thead>
<tr>
<th>14.4</th>
<th>Grade</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>B</td>
</tr>
</tbody>
</table>

**14.4** If less invasive treatment is not available or has failed, we suggest surgical ligation and excision of ovarian veins to treat reflux.
Conclusion

- Pelvic congestion syndrome (or PVI)
- Common
- Complex, Multifactorial
- Our experience has matched many of the results in the literature.
- Evidence mounting but need more.
Future directions in research

• Patient selection
• Pathophysiology
• Long term outcomes
References (1/3)


References (2/3)


Thank you