Utilization of liquid embolics and coils in pelvic venous disorder

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Disclosure

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I have the following potential conflicts of interest to report:

☑ Consulting: Medtronic, Balt, Guerbet, GEM
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

☐ I do not have any potential conflict of interest
Treatment depends on results of retrograde selective venography

- Looking for pelvic varices
  - Ovarian veins study
- Looking for pelvic leakage sites
  - Internal iliac veins and afferents study
    - Inferior gluteal vein
    - Uterine vein
    - Internal pudendal vein
    - Obturator vein
- Looking for Nutcracker syndrome
  - Left renal vein study
- Looking for May-Thurner syndrome
  - Left ilio-caval return study

Gold standard Valsalva Cartography
Venographic findings suggesting PCS

- Dilation of the ovarian vein (diameter > 6 mm)
- Ovarian vein reflux
- Uterine vein engorgement
- Congestion of the ovarian venous plexus
- Filling of pelvic veins across midline
- Filling of vulvovaginal or thigh varicosities

Endovascular options

Choose the optimal embolic agent ++

- Coils: 0.035’ or 0.018’ (detachable)
- Liquids +++
  - Treat collaterals
  - Complete venous filling
    - Glue
    - Sclerosing agents: not alone for large OV
      - 2 ml Polidocanol 2% + 4 ml air + 2 ml contrast = foam
      - Tetradecyl sulfate
      - Sodium morrhuate
    - Onyx /Squid
      - Safer
- Plugs
  - Oversizing can lead to pain
- Combination: coils + liquids +++
Few comparative studies

A Randomized Trial of Endovascular Embolization Treatment in Pelvic Congestion Syndrome: Fibered Platinum Coils Versus Vascular Plugs With 1-Year Clinical Outcomes

Jose A Guirola 1, Maria Sánchez-Ballestín 1, Sergio Sierre 2, Celia Lahuerta 1, Victoria Mayoral 1, Miguel A De Gregorio 3

**Results:** Clinical success and subjective improvement were not significantly different at 1-year follow-up (89.7% for FPCs vs 90.6% for VPs; P = .760). Mean number of devices per case was 18.2 ± 1.33 for FPCs and 4.1 ± 0.31 for VPs (P < .001). Three FPCs and 1 VP migrated to pulmonary vasculature approximately 3–6 months after the embolization procedure; all were retrieved without complications. The FPC group had a significantly longer fluoroscopy time (33.4 min ± 4.68 vs 19.5 min ± 6.14) and larger radiation dose (air kerma 948.0 mGy ± 248.45 vs 320.7 mGy ± 134.33) (all P < .001).

**Conclusions:** Embolization for PCS resulted in pain relief in 90% of patients; clinical success was not affected by embolic device. VPs were associated with decreased fluoroscopy time and radiation dose.

Coils alone

- Limitations
  - Needs a lot of coils
  - Repermeabilisation
  - Migration
    - Detachable +++
    - Oversize
Sclerotherapy alone

- Limitations despite low cost
  - Dilution choice: 0.5%, 1%, 2% ?
  - Risk of migration/stroke, arrythmia, thrombosis
  - Allergy
  - Unpredictable diffusion space
  - Inefficient in case of large varices
  - Total amount limited ++
Glue alone: fast & efficient

- Deep learning curve ++
- Local anesthesia
- Advantages
  - Cheap & visibility
  - Fast release
  - Adhesive & sclerosant
- One shot embolization
- Risks...?
  - Adherence
  - Entrapment
  - Migration

- Previous microcatheter flushing with D5%
- Mixing with lipiodol
  - 1:1 ratio Glubran2 or MagicGlue/Lipiodol
- Slow & regular injection of the mixture while removing micro
- Under Valsalva
- Pull out curtly the microcatheter

Comparison of three different embolic materials for varicocele embolization: retrospective study of tolerance, radiation and recurrence rate

Nicolas Favard 1, Morgan Moulin 1, Patricia Fauque 2, Aurélie Bertaut 1, Sylvain Faveller 1,
Louis Estalalet 1, Frédéric Michel 1, Luc Cernier 1, Paul Saget 1, Romaric Loffroy 1
Typical LOV embolization
Typical bilateral PCS embolization with coils & glue/lipiodol mixture
Copolymers: Onyx/Squidperi

- May be safer
- More controlled release
- “AVM nidus-like” filling
- Less inflammation post-procedure
- Sponge-like cast
- Slow release
- Low risk of migration
- Does not stick to catheter

Limitations: cost +++/more painful
Pelvic varices ++

Left ovarian vein incontinence
Protecting proximal gonadal vein
Closing hypogastric anastomosis
Filling distal venous space
Left ovarian vein phlebography showing pelvic varices

Distal microcatheterization crossing mid-line
Opacification of the right side through the microcatheter

EVOH embolization and filling of the periuterine plexus
Complete occlusion of the varices

Final injection under road-mapping subtraction
Looking for pelvic leakage sites

- Inferior gluteal vein
- Uterine vein
- Internal pudendal vein
- Obturator vein
Obturator varices
liquid + coils

Coiling of the IGV

No choice
Looking for Nutcracker syndrome

- Young women: Early stage
- Middle aged women: Late stage
Looking for May-Thurner syndrome

• LCIV compression
• Left ilio-caval return study

“Extrinsic compression of the LCIV by the arterial system against bony structures. This causes a localized focal stenosis or “spur” with subsequent venous outflow obstruction/stenosis and venous hypertension in the ipsilateral limb”
Looking for PCS +++
Left ilio-caval return study: chronic DVT sequelae
Obstructive synechiae

Predilation

Post-stenting
Right ovarian vein incompetence

Coils + liquids
Obturator varices

Cross midline
Effectiveness of Embolization or Sclerotherapy of Pelvic Veins for Reducing Chronic Pelvic Pain: A Systematic Review

Jane P. Daniels, PhD, Rita Champaneria, MPhil, Laila Shah, MSc, Janesh K. Gupta, FRCOG, Judy Birch, BSc, and Jonathan G. Moss, FRCS, FRCR

ABSTRACT

Purpose: Chronic pelvic pain (CPP) in the presence of dilated and refluxing pelvic veins is often described as pelvic congestion syndrome (PCS), although the causal relationship between pelvic vein incompetence and CPP has not been established. Percutaneous embolization is the principal treatment for PCS, with high success rates cited. This study was undertaken to systematically and critically review the effectiveness of embolization of incompetent pelvic veins.

Materials and Methods: A comprehensive search strategy encompassing various terms for pelvic congestion, pelvic pain, and embolization was deployed in 17 bibliographic databases, with no restriction on study design. Methodologic quality was assessed. The quality and heterogeneity generally precluded meta-analysis. Results were tabulated and described narratively.

Results: Twenty-one prospective case series and one poor-quality randomized trial of embolization (involving a total of 1,308 women) were identified. Early substantial relief from pain was observed in approximately 75% of women undergoing embolization, and generally increased over time and was sustained. Significant pain reductions following treatment were observed in all studies that measured pain on a visual analog scale. Repeat intervention rates were generally low. There were few data on the impact on menstruation, ovarian reserve, or fertility, but no concerns were noted. Transient pain was common following foam embolization, and there was a < 2% risk of coil migration.

Conclusions: Embolization appears to provide symptomatic relief of CPP in the majority of women and is safe, although the quality of the evidence is low.
Meta-analysis of rates of complete and excellent or moderate (combined) improvement 4–8 weeks following embolization
Take home points

- Embolization could be considered the most effective treatment for PCS
- Reported pain relief of more than 80-90%
- The technique depends on
  - Type of patients
  - Type of vessels
  - Type of embolic materials
- Approach to anomalies (Nutcracker, May-Thurner)
- Lack of strong scientific evidence yet
- Liquids (‘reservoir’) combined with coils (protection) +++