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## Pelvic Congestion Syndrome case series: results of endovascular treatment

### *Síndrome da Congestão Venosa Pélvica e resultados do tratamento endovascular: série de casos*

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#### Abstract

Pelvic Congestion Syndrome (PCS) is a cause of chronic pelvic pain that primarily affects multiparous women of reproductive age. Embolization of pelvic varicose veins offers excellent results for treatment of this syndrome. We describe an initial series of patients treated with embolization of pelvic varicose veins and their respective postoperative follow-up results. We provide clinical data, details of the procedures performed and results of follow-up and imaging exams for six patients. The technical success rate with these patients was 100% and there were no reports of serious intraoperative or postoperative complications. In all cases there was relief from symptoms and improvements in the results of imaging exams during short-term follow-up. The results of this small series of cases indicate that embolization is a safe and effective treatment for PCS.

**Keywords:** Pelvic Congestion Syndrome; pelvic venous incompetence; chronic pelvic pain; embolization; endovascular treatment; case series.

#### Resumo

A Síndrome da Congestão Venosa Pélvica (SCVP) é uma causa de dor pélvica crônica, que afeta principalmente mulheres múltiparas em idade reprodutiva. Para o tratamento desta síndrome, a embolização de varizes pélvicas tem demonstrado excelentes resultados. Relatamos uma série inicial de pacientes submetidas a tratamento com embolização de varizes pélvicas e os respectivos resultados de acompanhamento pós-operatório. São apresentados dados clínicos, detalhes do procedimento e resultados do acompanhamento e de exames de imagem de seis pacientes. Dentre estas pacientes, o sucesso técnico foi de 100% e não houve relato de complicações trans ou pós-operatórias graves. Em todos os casos, pôde-se observar alívio dos sintomas e melhora nos resultados de exames de imagens no acompanhamento de curto prazo. Os resultados nesta pequena série de casos indicam que a embolização é um tratamento seguro e efetivo para a SCVP.

**Palavras-chave:** Síndrome da Congestão Venosa Pélvica; incompetência venosa pélvica; dor pélvica crônica; embolização; tratamento endovascular; série de casos.

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## ■ INTRODUCTION

Pelvic Congestion Syndrome (PCS) is a condition in which pelvic varicose veins cause dilation and venous stasis of the organs in the pelvic cavity and, as a consequence, chronic pelvic pain (CPP).<sup>1</sup> The venous dysfunction has its origins in a multifactorial process, in which an increase in abdominal pressure and the action of female hormones appear to be central factors and may explain the syndrome's higher incidence among multiparous women of reproductive age and the disappearance of symptoms during menopause.<sup>1</sup>

A study by Ascitutto et al.<sup>2</sup> found that the left gonadal veins and right internal iliac veins are most often affected (57.7% for both). In the majority of cases (53.5%) two or more veins will be incompetent.

Obstructive anatomic abnormalities of the pelvic venous system can also lead to secondary PCS.<sup>3</sup> Extrinsic compression of the left renal vein, impeding flow to the inferior vena cava (nutcracker phenomenon), is one possible cause of pelvic varicose veins and incompetence of the left gonadal vein that should be considered.<sup>4</sup> Another possible cause of the dysfunction, via a similar mechanism, is left common iliac vein compression (May-Thurner) syndrome.<sup>5</sup>

The most common clinical presentation of PCS is a case of CPP with no evidence of inflammatory disease. In general, the pain worsens during the perimenstrual period and with increased intra-abdominal pressure, generally accompanied by dyspareunia and postcoital discomfort, urinary symptoms (secondary to varicose veins in the bladder wall) and feelings of heaviness in the pelvis and legs.<sup>6</sup> Physical examination may reveal varicose veins involving the vulva, perineal area and buttocks, and pain if the cervix of the uterus is moved.<sup>3</sup>

Well-directed patient history and physical examination should lead to a diagnostic suspicion, which should then be confirmed with supplementary examinations.<sup>7</sup>

These investigations should preferably begin with color Doppler ecography, which is a widely-available examination that offers the possibility of a dynamic study of venous flow, showing venous reflux and stasis.<sup>6</sup> Findings of gonadal veins with diameters larger than 5 mm on abdominal or transvaginal ultrasonography have a positive predictive value of 71.2%, increasing to 83.3% when diameters are greater than 6 mm.<sup>8</sup>

Investigation can also be accomplished using computed tomography (CT) angiography or magnetic resonance (MRI) angiography. Diagnosis is confirmed using criteria proposed by Coakley et al.,<sup>9</sup> as follows: four or more ipsilateral tortuous veins, with diameters > 4 mm, and a gonadal vein with a diameter > 8 mm.

Venography is the gold standard method for diagnosis. The following findings should be present: gonadal vein with a diameter > 6 mm; retrograde venous flow; several collateral veins with tortuous paths, and slow drainage of the contrast after injection.<sup>3</sup>

Treatment of PCS by embolization of gonadal veins with minimally invasive endovascular procedures is becoming increasingly popular. It is conducted via the same catheterization used for diagnostic venography and, performed in this manner, the treatment has proved to be safe and effective for control of the condition, with low rates of relapse and complications.<sup>10</sup>

This article was approved by the local institutional Ethics Committee. The objective is to report an initial series of six cases of patients diagnosed with PCS who were treated using the endovascular technique at the Clínica Coris Medicina Avançada, in the city of Florianópolis, SC, Brazil, from 2011 to 2013, analyzing the results of clinical and imaging examinations conducted before treatment, intraoperatively and during the short-term postoperative period.

## ■ CASE REPORTS

Medical records were reviewed for six patients, all female, aged from 39 to 51 years. All were multiparous and their number of prior vaginal deliveries varied from 2 to 5. Three of these patients had varicose veins of the lower limbs, one had varicose veins involving the left buttock. Five of them had a history of non-cyclical CPP and one only reported long term feelings of pelvic 'heaviness'. The majority of cases (five) had pelvic varicose veins identified on color Doppler echography. In three cases investigations were supplemented with another imaging exam: CT (one case) or MRI (two cases). One patient also exhibited ultrasonographic signs suggestive of May-Thurner Syndrome, which were confirmed by MRI. In one case pelvic varicose veins were an incidental finding during CT. When questioned, this patient reported CPP of as yet unknown etiology. Table 1 summarizes this information. In all cases, venography confirmed the findings of the initial work-up examinations.

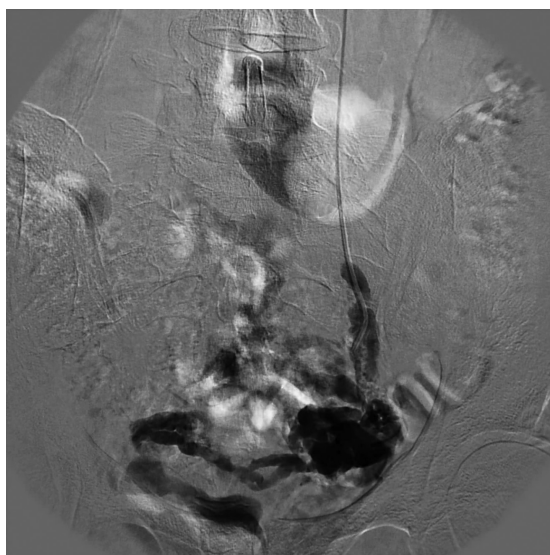
In all six cases an endovascular approach was used. Access was achieved by echo-guided puncture of the basilic or cephalic vein at the cubital fossa, with a proximal tourniquet. In all cases, a 5F sheath was used with a 'roadrunner' hydrophilic guidewire. Initially, an anatomic and hemodynamic investigation of the pelvic venous plexus was conducted, with observation of the structure and the flow of the inferior vena cava and of the renal veins, gonadal

**Table 1.** Summary of results of review of medical records for the patients studied.

Age	Vaginal Deliveries	Clinical presentation	Diagnostic Method	Treatment	Follow-up (Control examinations)
39	3	CPP Varicose veins in LL	Color Doppler echography	L Gonadal V (9coils) 15 mL foam	2 consultations (Color Doppler echography)
44	2	CPP Incidental finding on CT	CT	L Gonadal V (5coils) R Gonadal V (3coils) 20 mL foam	3 consultations (CT)
43	2	Pelvic heaviness + Recurrent varicose veins in LL	Color Doppler echography + CT	L Gonadal V (5coils) R Gonadal V (5coils) 30 mL foam	4 consultations (Color Doppler echography)
51	4	CPP + Varicose veins in left buttock	Color Doppler echography + MRI	L Gonadal V (3coils) 10 mL foam	2 consultations (Color Doppler echography)
50	2	CPP + Varicose veins in LL	Color Doppler echography	L Gonadal V (6coils) 20 mL foam	2 consultations (Color Doppler echography)
49	5	CPP + LLL Edema + May-Thurner Syndrome	Color Doppler echography + MRI	L Gonadal V (4coils) 18 mL foam Stent L common iliac V	2 consultations (Color Doppler echography)

CPP= chronic pelvic pain; LL= lower limbs; LLL= left lower limb; CT= computed tomography angiography; MRI= magnetic resonance angiography; V= vein; L= left; R= right.

veins and internal iliac veins. In all patients, pelvic varicose veins were identifiable, the diameter of at least one of the gonadal veins was larger than normal (a dilated left gonadal vein was present in 100%) and there were signs of reflux in the pelvic venous plexus (Figure 1). After confirmation of venous dilation and reflux, selective catheterization of the vessel was performed with a multipurpose, vertebral or mammary 5F catheter (the choice was made on the basis of each patients' anatomy) followed by embolization of the pelvic varicose veins with dense polydocal foam (10 to 20 mL at 1 to 3%). The polydocal foam was diluted using room air at a proportion of 1 mL of polydocal to 4 mL of air. Making use of the same selective catheterization, the vessel was embolized using an average of five coils with fibers per treated vein (Figure 2). Coils with diameters from 6 to 10 mm were used with uncontrolled release distally and controlled release in more proximal sites, with minimum oversizing of 20% and the sandwich technique in the distal portion. In just two patients the right gonadal vein was found to be dilated and was embolized. In all of the other patients, the diameter of the right gonadal vein was not large and catheterization was not performed. The patient who had been diagnosed with May-Thurner Syndrome was treated during the same intervention using a 22 × 60 mm Wallstent (R) self-expanding stent, placed in the left common iliac vein. None of the other patients had abnormalities of the iliac veins that required intervention. Vena cava filters were not used during the procedures. There were no intraoperative or immediate postoperative



**Figure 1.** Digital subtraction venography image of selective catheterization of the left gonadal vein, showing venous dilation and stasis of contrast medium.

complications in any of the procedures. All patients were discharged from hospital less than 24 hours after the procedures.

During postoperative follow-up, all patients reported significant improvements in symptoms at the first follow-up consultation, an average of 7 days after the procedures. All patients attended at least two postoperative follow-up consultations. Just one of them exhibited mild hematoma at the puncture site. At the time of writing, none had required reintervention or

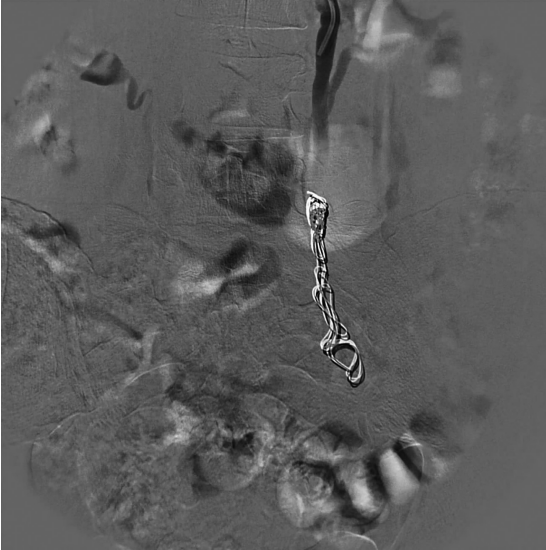


Figure 2. Digital subtraction venography image after embolization of the left gonadal vein using coils with fibers and dense microfoam.

suffered relapse of their symptoms. Postoperative control examinations were conducted using color Doppler echography in five patients and CT in one patient. None of the control examinations found pelvic varicose veins, confirming successful embolization. All patients considered the final result satisfactory.

## DISCUSSION

The data compiled for this article revealed that all of the patients treated exhibited clinical improvement and their imaging exams confirmed the efficacy of embolization. Despite the study's limitations – the short follow-up period and the lack of standardization of postoperative assessments – the results reported are comparable with those of studies undertaken with larger samples.

For example, Kies and Kim<sup>10</sup> conducted a review of studies published between 1993 and 2008. They analyzed 12 studies and the results showed significant relief from symptoms, varying from 50 to 100.

Laborda et al.<sup>11</sup> followed 202 patients for five years with repeated assessments and observed a reduction in visual pain scale scores from  $7.34 \pm 0.7$  (preoperative) to  $0.78 \pm 1.2$  (5 years later). An earlier study conducted by Kim et al.<sup>12</sup> with 127 patients and a similar design reported comparable preoperative visual pain scale scores ( $7.6 \pm 1.8$ ), but the results observed during follow-up were less significant, with a mean score of  $2.9 \pm 2.8$ .

The only randomized study of PCS comparing different types of intervention was published by

Chung and Huh<sup>13</sup> and showed that embolization was superior in several areas, such as reduction of symptoms and length of hospital stay. However, the scarcity of comparative studies means that the choice of the most appropriate technique for the procedure remains controversial. The choice of the most effective method is also dependent on the physician's preference and experience, the methods available and the treatment setting.

Once embolization has been chosen, the most accepted approach recommends bilateral intervention in both gonadal veins, since this is associated with better results. Notwithstanding, the right gonadal vein very often has a small diameter and is difficult to see, which was the case in four out of the six patients studied here. In these circumstances treatment of the left gonadal vein only is acceptable, since with these anatomic findings it is unlikely that the right gonadal vein is responsible for the symptoms.<sup>6</sup>

None of the patients described here suffered serious complications. Mild intercurrent conditions observed were hematoma of the puncture site and postoperative abdominal pains, which did not affect the final results. The most worrying complication of this procedure is migration of the coils into pulmonary circulation and this did not take place in any of the patients in this series.

Embolization is suggested as treatment of choice for PCS and has a 2B recommendation, according to the Society for Vascular Surgery and the American Venous Forum.<sup>14</sup> However, more widespread use of this method is primarily prevented by underdiagnosis of PCS and the lack of more precise indications and of definitions of symptoms considered sufficiently important to justify intervention.<sup>15</sup>

In this study, embolization proved to be a safe and effective method. Even so, we believe that technological advances and improvements to the materials employed could improve the final results still further. Additionally, use of protocols standardizing diagnostic investigations, the treatment approach and analysis of results could define groups of patients who would benefit even more from this method.<sup>16</sup>

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