

Invited Review

Apples and oranges in pelvic venous disorders: Heterogeneity and best practice

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Abstract

Pelvic venous disorder represents an as common as challenging clinical scenario because of the blurred borders between pelvic region and lower limb treatment target, because of the subtle and aspecific signs and symptoms, because of the lack of large randomized comparative trials providing clarity on the best practice and strong recommendations. Herein we present pathophysiology and clinical considerations on the lower limb varicosities of pelvic origin, suggesting possible management strategies based on clinical manifestation, ultrasound detection and targeted sclerotherapy. Large studies are needed to identify the best diagnostic parameters guiding the best strategy and highlighting the most reliable reported outcomes from such heterogeneous patients.

Keywords: Pelvic venous disorder, chronic pelvic pain, lower limb varicose veins, heterogeneity

INTRODUCTION

Chronic pelvic pain is defined as noncyclical and lasting for more than 6 months [1].

Almost one woman out of three is affected and it represent a common indication for diagnostic laparoscopy, that eventually is unable to identify the cause in 40% of cases [2].

Pelvic venous disorder as pain cause is becoming more and more recognized in the global medical community. Nevertheless, the different possible involvement of the lower limb venous circulation by means of pelvic escape points depicts a heterogenous scenario that can still generate uncertainty on the best possible management [3].

A complex venous network is involved in pelvic venous disorders with different hemodynamics pattern potentially interested by the reflux. Renal, ovarian, visceral and parietal pelvic veins can be depicted as the reservoir interacting heterogeneously with

the lower limb deep and superficial networks through the pelvic floor.

Symptomatology does not always overlap vein dilation: a condition that is present in almost 50% of the asymptomatic patients [4].

The origin of pelvic pain can be found in more than just the dilation and the related nociceptor activation [5].

The same turbulent reflux can lead to endothelial pro-inflammatory phenotype expression with consequent symptomatology, exactly like for the lower limb hemodynamic impairment [6].

A very interesting paper by Gavrilov et al. recently demonstrated how reflux time in the parametrial, uterine and gonadal veins correlates with pain [7].

Nevertheless, the pathophysiology of the same pelvic pain is far more complex considering also the estradiol and progesterone levels can play a role in venodilation.

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This is in line with Ascuitto et al. observation of higher levels of oestradiol at the great saphenous vein level in subjects affected also by pelvic venous insufficiency [8].

Another factor involved in the heterogeneity of the clinical manifestation is the so called “central sensitization”: a neurobiological effect characterized by an increased responsiveness of nociceptors in the central nervous system to either normal or sub-threshold afferent input leading to hypersensitivity to stimuli [9].

Properly describing the hemodynamics patterns is fundamental to discriminate between simple vessel dilation and real inflammatory biosignaling.

Such inflammation can be asymptomatic in almost half of the cases, therefore a diagnostic suspect must be present anyhow [10].

Once again Gavrilov group demonstrated the predominance of the hemodynamics (reflux time) over the vessel dilation in the determination of the pelvic pain. Indeed, the linear correlation analysis showed a strong positive relationship (Pearson's $r=0.78$; $p=0.007$) of chronic pelvic pain with the pelvic venous reflux duration but not with vein diameter [11].

Clinical Management

The clinical aspects of the pelvic venous disorders requires a careful history taking as the symptomatology is extremely variable and the signs not always visible.

The pelvic pain and varices involving the vulva, perineum, or upper thigh might be influenced in their appearance by the eventual presence of a lower limb network receiving the pelvic venous volume overload, with or without compensation capacity. Indeed, empirically, it's possible to find women with leg varicosities without pelvic and/or leg symptoms possibly thanks to the capacitance property of the same lower limb venous system. To the contrary, more pelvic symptomatic patients can present with none if not minimal leg varicosities from pelvic source.

These practical observations remain anecdotal and dedicated investigations are encouraged for proper evidence on such clinical and pathophysiology aspects.

The sensitivity of the classically reported pelvic venous disorders symptoms such as prolonged postcoital ache, ovarian points tenderness and pain associated with long- standing reported a specificity of just 70% [12].

Cycle alterations and dyspareunia are also common but extremely aspecific for pelvic venous disorders, suggesting once again the need of an extremely careful history and clinical assessment of this type of patients.

In addition, consensus on the pelvic venous disorder diagnostic criteria is missing.

Catheter venography is considered a gold standard thanks to the possibility of exploring hemodynamics and pressure values, moreover during provocative maneuvers. Yet, it is an invasive test, still missing objective measure of reflux and clear cut-off values to indicate treatment.

Perineal, trans-vaginal and trans-abdominal ultrasound scanning represent the first line of investigation and can anticipate the presence of obstructive conditions to be better explored by contrasted magnetic resonance imaging (MRI) or computed tomography (CT). Anatomical only imaging can be confounding, therefore MRI and CT results should be combined with the clinical data and always interpreted remembering the pros and cons of each and every diagnostic approach.

For example, ultrasound can be immediately available, without ionizing radiation and at low cost, providing hemodynamic data. Yet, it's operator dependent, limited by body habitus.

CT can overcome the anatomical difficult visibility, even if with lower sensitivity than magnetic resonance venography, yet it delivers ionizing radiation and it's limited to the supine position. A major plus of CT is the possibility of detecting other causes of venous obstruction/reflux: a fundamental aspect in the detailed differential diagnosis that must always be performed in these patients.

MRI is extremely sensitive for pelvic varices and it offers dynamic imaging and other causes of obstruction/reflux detection, yet it's expensive and limited to supine positioning.

It's mandatory to highlight how the vein dilation per se is not an indication to treatment. Common findings of >6 mm dilated ovarian veins alone can not lead to the procedure. In the same way, smaller vessels findings can not exclude a pelvic venous reflux diagnosis.

It should also be noted that different pelvic pathology can lead to vein dilation with no pelvic vein reflux, among which fibroids.

Also for this reason, a careful OBGyn evaluation must be always taken into account [13].

Equally important is to remember that portal hypertension and/or neoplasm/vascular lesions can lead to increased blood flow and related vessel dilation: a phenomenon that resemble the venous volume overload of the lower limb sport-related vein dilation [14].

Clearly, treating directly the dilation and/or the reflux without proper management of the general condition would represent a major mistake in the proper patient management.

The investigation of these patients must carefully look not only at the abdominal and pelvic region, rather also at the lower limbs, where symptoms and signs of venous insufficiency can arise from pelvic sources.

Jin et al. reported 73.3% of patients with varicose veins of pelvic origin not presenting pelvic pain [15].

A hypothesis is that lower limb varicosities can represent a pelvic venous hypertension download leading to leg veins dilation.

In this context, the correct management of the same lower limb varicosities becomes a debatable discussion topic.

In case lower limb varicosities of pelvic origin are asymptomatic both at the pelvic and leg level, extreme cautious should be paid in the treatment strategy in order to avoid the removal of what could be considered a capacitance/bypassing venous network.

In case of lower limb only symptomatology, a possible approach is the treatment of the pelvic escape points by ultrasound guided foam sclerotherapy.

In our previously published experience, at a mean follow-up of 4.1 ± 1.4 years, 595/756 (78.7%) female patients, suffering of pelvic escape point reflux with a pelvic pain lower than 5/10 at the Visual Analogue Scale (VAS), were successfully treated by this technique. Reflux was suppressed after 1 injection in 304 patients, 2 injections in 281 patients, and 3 injections in 10 patients. Interestingly VAS significantly diminished both in the group with and without reflux suppression (from 3.4 ± 0.7 to 0.8 ± 0.3 and from 3.6 ± 0.7 to 2.1 ± 1 ($p < .05$), respectively). This finding points out once again how the indication to pelvic venous disorder treatment must focus on the clinical data together with the instrumental diagnostic assessment, rather than just on the report of a dilation and/or of a reflux [3].

The most appropriate approach toward embolization of pelvic veins has been debated for quite a long time now, with opposite perspectives reported in the literature [16,17].

A recent systematic reviewed showed the effectiveness of coil embolization for pelvic venous reflux, including VAS-measured symptomatology, urinary urgency and dyspareunia improvement. A significant heterogeneity was reported on the recurrence rate and on the assessed outcomes. For example, pain recurred from 5.9 to 25% at 1-2 years. Two randomized trials reported competitiveness of coil embolization compared to vascular plugs and hysterectomy [18].

Clearly, homogenous data collections and proper distinction in hemodynamics possible presentations of the different pelvic venous disorders scenario must be taken into consideration to avoid biases in the same data interpretation and in the related recommendations to treatment formulation.

The most recent overviews on the topic pointed out the need of proper validated treatment protocols to allow the design of appropriate randomized comparative trials, involving homogeneous techniques and treatment strategies. Objective outcome measures are mandatory to explore the different symptoms and related etiologies of pelvic venous disorders.

Identifying the different hemodynamic patterns and features, together with their correlation to the clinical manifestations, remains of fundamental importance to deliver proper recommendations for the management of different conditions grouped by the pelvic venous disorders terminology, but that remain characterized by different pathophysiology and clinical scenarios [19,20].

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