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Incidence and management of symptomatic pelvic venous disorders in patients with lower extremity varicose veins

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Abstract

Background: Pelvic venous disorders (PeVD) are a recognized cause of venous origin chronic pelvic pain (VO-CPP) in women. However, the prevalence and management of PeVD in patients with lower extremity varicose veins remain understudied. This study assesses the incidence of PeVD among women with superficial venous insufficiency (SVI) and evaluates the role of transvaginal ultrasound (TVUS) as a screening tool.

Methods: A retrospective analysis was conducted on 350 female patients with SVI (CEAP C2-C6) from January 2021 to December 2023. SVI was confirmed by duplex ultrasound (DUS). All patients were evaluated for CPP at the initial visit. In those with CPP, pelvic symptom management preceded any lower limb intervention. Symptomatic patients were assessed using the Pelvic Venous Congestion Symptom Scale (PVCSS), Visual Analog Scale (VAS), and TVUS for features suggestive of PeVD. In confirmed cases, diagnostic venography and ovarian vein embolization were performed, followed by saphenous vein ablation.

Results: PeVD was identified in 11% (37/350) of patients. TVUS revealed pelvic varicosities, ovarian veins dilation >6 mm, and reflux, confirmed by venography. Of the 37 patients, 41% (15/37) underwent embolization, while 59% opted for conservative management. Post-treatment, median PVCSS scores improved from 20 to 2 ($p < 0.001$), and VAS scores from 8 to 0 ($p < 0.001$), indicating significant symptom relief. Mean follow-up was 17 months, with assessments at 1, 6, and 12 months. Reintervention-free survival was 86.7%.

Conclusion: Approximately one in 10 women with SVI have symptomatic PeVD, highlighting the importance of targeted screening. TVUS serves as a useful non-invasive diagnostic tool. Further studies are needed to clarify optimal treatment strategies and long-term outcomes in this population.

Keywords

Symptomatic pelvic venous disorders, superficial venous insufficiency, chronic pelvic pain, ovarian vein embolization, varicose veins

Introduction

Chronic pelvic pain (CPP) is defined by the American College of Obstetricians and Gynecologists (ACOG) as non-cyclic pain perceived in the pelvic region lasting for 6 months or more and associated with functional impairment, regardless of its exact etiology.[1] It affects up to 25% of women of reproductive age and 15% of all women globally, accounting for approximately 20% of outpatient gynecological visits.[2] CPP has been linked to conditions such as adenomyosis, endometriosis, musculoskeletal disorders, chronic pelvic inflammatory disease, irritable bowel syndrome (IBS), interstitial cystitis, and pelvic floor dysfunction. However, in over half of cases, no specific cause is identified. Due to its multifactorial nature, CPP management requires a multidisciplinary approach involving

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gynecologists, vascular specialists, urologists, and physiotherapists to ensure individualized care.

Pelvic venous disorders (PeVD), formerly known as pelvic congestion syndrome (PCS), are complex and often underdiagnosed conditions primarily linked to venous origin chronic pelvic pain (VO-CPP). PeVD is characterized by pelvic and peri-uterine varicosities, leading to symptoms such as chronic pelvic pain, dyspareunia, and pelvic heaviness.[3] PeVD diagnosis is supported by imaging modalities such as transvaginal ultrasound (TVUS), computed tomography (CT) venography, and magnetic resonance venography (MRV), which detect features suggestive of venous pathology. However, imaging findings must always be interpreted in conjunction with clinical symptoms to establish a diagnosis.[3] Pelvic varicosities develop through mechanisms similar to those in the lower extremities, including defective venous valves, retrograde blood flow, and venous engorgement; additionally, venous outflow obstruction—such as compression of the left renal or iliac veins—can contribute to the pathophysiology of pelvic venous disorders. Ovarian and internal iliac vein reflux are central to PeVD pathophysiology, leading to venous hypertension and varicosity formation. Dysfunction or absence of venous valves exacerbates reflux, disrupting normal circulation. PeVD symptoms include pelvic pain, perineal heaviness, urinary incontinence, dyspareunia, and post-coital aching.[4] Varicose veins may also appear in the vulva, perineum, or lower extremities, presenting with diverse symptoms.[5] Patients often describe the pain as a dull, aching, or pressure-like sensation, which is typically exacerbated by prolonged standing and alleviated when lying down. While hematuria and flank pain may be observed in some patients, these symptoms are not characteristic of venous origin chronic pelvic pain (VO-CPP). Instead, they are more commonly associated with left renal vein (LRV) compression (Nutcracker syndrome). In such cases, venous hypertension may result from outflow obstructions, such as left renal vein (LRV) or left common iliac vein (LCIV) compression, leading to compensatory reflux in the pelvic venous system - including the left ovarian vein -which contributes to the development of PeVD.[6] This study focuses on PeVD, and therefore, Nutcracker syndrome is beyond its scope. The nonspecific presentation of PeVD often prolongs diagnosis, delaying appropriate treatment. Emerging evidence links pelvic venous insufficiency to recurrent varicose veins.[7] Studies highlight pelvic vein incompetence as a contributor to recurrence, underscoring the need for thorough preoperative evaluation.[7,8] The impact of pelvic venous insufficiency on the recurrence of varicose veins remains hypothetical. Notably, previous studies have primarily focused on the incidence of venous insufficiency in patients with confirmed PeVD.[7,8] Recently, Jaworucka-Kaczorowska et al. provided important insight into the management of extra-pelvic varicosities of pelvic origin, supporting the need for a more comprehensive diagnostic and therapeutic strategy in such patients.[9]

This study examines the incidence, symptoms, and treatment outcomes of PeVD in women with lower extremity venous insufficiency, providing novel insights into their co-occurrence. While treatment outcomes are reported for completeness, the primary focus remains on the epidemiological characteristics of PeVD and its association with chronic venous insufficiency.

Methods

This retrospective cohort study analyzed prospectively collected data in compliance with local ethics committee guidelines and the Declaration of Helsinki. All participants provided written informed consent before any intervention.

Patient population

From January 2021 to December 2023, all female patients diagnosed with SVI at our institution were evaluated. Inclusion criteria required the presence of both CPP and SVI. CPP was defined per ACOG guidelines[10] as non-cyclic pelvic pain persisting ≥6 months, significantly impacting daily activities and necessitating medical evaluation. A detailed medical history was collected, emphasizing PeVD-related symptoms. Patients with CPP were assessed for venous origin features, such as symptom exacerbation with prolonged standing, relief in the supine position, coexisting lower extremity varicosities, and perineal heaviness. Collected data included patient age at pelvic pain onset, parity, in vitro fertilization (IVF) history, prior uterine/ovarian surgeries, comorbidities such as Hashimoto's disease, thrombophilic disorders, prior deep vein thrombosis, smoking status, and CEAP (Clinical-Etiology-Anatomy-Pathophysiology) classification. All SVI patients underwent initial evaluation using the PVCSS (Table 1) and Visual Analog Scale (VAS). SVI diagnosis was based on clinical symptoms (CEAP C2-C6 classification) and confirmed with duplex ultrasound (DUS). DUS criteria included reflux duration >0.5 s in the great saphenous vein (GSV), small saphenous vein (SSV), or perforator veins (diameter >3.5 mm, reflux >0.35 s), and vein dilation >5 mm (GSV) or >4 mm (SSV). TVUS was performed only in patients with a PVCSS score >1, in alignment with international recommendations.[10] Positive findings prompted a diagnostic venography and ovarian vein embolization. According to the European Society for Vascular Surgery (ESVS) 2022 guidelines,[10] embolization was indicated for ovarian/internal iliac vein dilation >6 mm, reflux >1 s on spectral Doppler, and/or peri-uterine varicosities. Additionally, reversed flow in the gonadal veins during the Valsalva maneuver was considered diagnostic for venous reflux. Sclerotherapy was considered for parametrial

Table 1. Pelvic venous congestion symptom scale (PVCSS) scoring system— This table presents the scoring system for assessing the severity of pelvic congestion symptoms. The scale evaluates 10 key clinical manifestations, with scores ranging from 0 (no symptoms) to 3 (severe symptoms with significant impact on quality of life). The total score classifies severity as mild (1–10), moderate (11–20), or severe (21–30).

Symptom	Score 0	Score 1	Score 2	Score 3
Pelvic pain (non-menstrual)	None	Occasional, no impact	Frequent, moderate impact	Persistent, severe impact
Pelvic heaviness	None	Rare	Frequent, worsens later in day	Persistent all day
Pelvic discomfort	None	Rare	Frequent, worsens later in day	Persistent all day
Sacral/Coccygeal pain	None	Rare	With prolonged sitting	Immediate onset in sitting position
Urinary symptoms (dysuria, frequency, incontinence)	None	Rare	Post-exertion or end of the day	Constant, daily symptoms
Atypical varicose veins	None	Rare	Perineum/lower abdomen	Extensive (groin, thighs, buttocks)
Dyspareunia (painful intercourse)	None	Rare	During intercourse	During and post-intercourse
Menstrual irregularities	None	Rare	Irregular/excessive bleeding	Severe, prolonged, disabling symptoms
Genital/Perineal tenderness	None	Rare	Occasional	Persistent, daily pain
Genital/Perineal edema	None	Rare	Post-exertion	Constant swelling

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varicosities when additional treatment was warranted. Pain severity was assessed using the Visual Analog Scale (VAS),[11] where scores ranged from 0 ('no pain') to 10 ('worst possible pain'). While VAS reflects changes in symptom burden, it does not directly evaluate broader Quality of life (QoL) aspects.

Embolization technique and SVI treatment

Diagnostic venography was performed via transfemoral approach under local anesthesia in the supine position. A 5-Fr introducer sheath was placed in the femoral vein. A 4-Fr Cobra catheter assessed the left ovarian vein, and a Simmons 1 catheter evaluated the right ovarian vein. All patients received 5000 units of heparin. Ovarian veins were catheterized using a Progreat® microcatheter (Alameda, CA, US), and reflux was assessed via selective iodinated contrast injection. Embolization was performed using the Ruby® Coil System (Penumbra Inc., Alameda, CA, USA), delivered through the microcatheter positioned within the ovarian veins. In symptomatic patients with periuterine varices of small to moderate caliber, 2% polidocanol foam was selectively administered through the same access before embolization of the gonadal vein was initiated, to ensure effective sclerotherapy of distal varicosities, in accordance with standard practice. Sclerotherapy was not performed for large-caliber periuterine varicosities, due to limited supporting evidence and potential safety concerns. The embolization was conducted up to the level of the first lumbar branches. Post-procedure, patients were monitored for 6 to 12 h.

One-week post-procedure, patients underwent endovenous laser ablation of the saphenous vein, combined with foam sclerotherapy for spider veins and mini-phlebectomies for larger varicose or insufficient perforator veins.

Follow-up

Follow-up included clinical reassessment with PVCSS and VAS scoring at 1-, 6-, and 12-month post-procedure, along with transvaginal ultrasound imaging at 6 months or earlier if clinically indicated. Symptom recurrence prompted a diagnostic venogram to evaluate residual or recurrent venous reflux and obstruction. Recurrence was defined as the reappearance of symptoms after an initial period of improvement. Imaging follow-up was not routinely performed unless clinically indicated.

Study endpoints

The primary endpoint was the incidence of PeVD, determined via transvaginal ultrasound (TVUS). TVUS was conducted exclusively in symptomatic patients with a PVCSS score >1, aligning with ACOG-defined chronic pelvic pain (CPP) criteria to ensure a clinically relevant assessment. PVCSS was employed to quantify symptom

severity in a consecutively evaluated female cohort with SVI. However, it remains an unvalidated tool for differentiating venous-origin CPP from other etiologies. PeVD diagnosis was based on the combination of suggestive TVUS findings and corresponding clinical symptoms, according to established imaging and symptom-based criteria. Diagnosis did not require a minimum PVCSS score but relied on standardized ultrasound-based parameters. PeVD diagnosis was confirmed if the study identified: (1) ovarian/internal iliac vein dilation >6 mm, (2) reflux >1 s on spectral Doppler (Valsalva maneuver), and (3) peri-uterine varicosities. Additional findings, such as venous tortuosity and asymmetric engorgement, further supported the diagnosis per ESVS 2022 guidelines.[10] Secondary endpoints included: (1) treatment acceptance rate, (2) technical success (complete occlusion of refluxing ovarian veins on venography), and (3) clinical success (PVCSS and VAS score improvement). PVCSS severity was classified as mild (1–10), moderate (11–20), and severe (21–30). Complete clinical success was defined as PVCSS reduction to 0–1, while partial success required improvement by at least one category (e.g., severe to moderate). Recurrence was defined as symptom return to pre-treatment levels within 6 months.

Statistical analysis

Statistical analysis was conducted using MedCalc 2.0 (Ostend, Belgium). Descriptive statistics summarized patient characteristics and outcomes. Categorical variables were reported as absolute counts and percentages. Continuous variables were summarized as mean ± standard deviation (SD) for normally distributed data, and as median with interquartile range (IQR) for non-normally distributed data. Distribution normality was assessed using the Pearson-D'Agostino test. Comparisons between baseline and follow-up scores for continuous variables were performed using paired samples t-tests for normally distributed data. For non-normally distributed variables, the Wilcoxon signed-rank test was used. Categorical variables were compared using the chi-square test or Fisher's exact test, as appropriate. Kaplan-Meier survival analysis was used to assess reintervention-free survival, and differences between groups were evaluated using the log-rank test. Statistical significance was set at $p < 0.05$.

Results

A total of 350 female patients with SVI were enrolled during the study period. Of these, 62% (217 patients) had a PVCSS score >1, while 22% (78 patients) met the ACOG criteria for CPP. Among them, PeVD was confirmed via transvaginal ultrasound (TVUS) in 37 cases (11%). The baseline characteristics of the study cohort with concurrent lower limb venous insufficiency and PeVD are summarized in Table 2.

Table 2. Baseline characteristics of female patients with pelvic congestion syndrome and lower extremity venous insufficiency.

Patients' characteristics	Total $N = 37$
Mean age, in yrs (±SD)	44 ± 11
Median number of childrens, (IQR)	2 (1–3)
Previous IVF, in %	1 (3%)
Previous operation in uterus or ovarians, in %	3 (8%)
Hashimoto disease, in %	12 (32%)
Thrombophilic disorder, in %	4 (11%)
Previous deep vein thrombosis, in %	2 (5%)
Active smoking, in %	6 (16%)
Median CEAP classification score, (IQR)	3 (2–4)

IVF: in vitro fertilization, IQR: interquartile ratio, SD: standard deviation.

The PVCSS indicated mild PeVD in four patients (11%), moderate in 27 patients (73%), and severe in six patients (16%). Diagnostic venography confirmed the transvaginal ultrasound findings in all cases. In all patients with PeVD diagnosed via TVUS, venography confirmed ovarian vein reflux and peri-uterine varicosities, reinforcing the diagnostic reliability of TVUS as a non-invasive screening tool. The primary findings included ovarian vein reflux and peri-uterine varicosities. Left common iliac vein compression was not identified in our cohort; however, routine pelvic venography to evaluate for iliac vein compression (e.g., May-Thurner syndrome) was not systematically performed. This may have led to underdiagnosis of concomitant venous outflow obstruction. Renal vein compression (Nutcracker syndrome) was not systematically assessed, as it falls outside the primary scope of PeVD evaluation.

Among the 37 PeVD patients, 15 (41%) opted for ovarian vein embolization, while 22 (59%) declined intervention due to concerns regarding procedural risks and personal preference. A subset of these patients proceeded with isolated treatment of their SVI. Their outcomes demonstrated comparable improvement in lower extremity symptoms; however, pelvic symptoms persisted in this group. Diagnostic venography was performed only in symptomatic patients who had undergone transvaginal ultrasound (TVUS) and were considered for embolization based on their clinical presentation. Venography was not routinely performed in asymptomatic patients or those who declined intervention. This approach was intended to minimize unnecessary invasive testing and was consistent with current diagnostic guidelines favoring a symptom-driven imaging algorithm for PeVD. Although the mean PVCSS score was higher in the embolization group (18.4 ± 6.42) compared to non-intervened patients (16.05 ± 5.01), this difference was not statistically significant ($p = 0.31$). The logistic regression analysis showed a minor increase in

embolization likelihood with higher PVCSS scores (odds ratio: 1.08), yet the association was weak (Spearman's rho = 0.17, $p = 0.40$). These findings suggest that factors beyond symptom severity, such as patient preference and physician recommendations, played a role in the decision-making process. In 13 out of the 15 patients (87%), embolization was successfully performed on both ovarian veins, achieving a 100% technical success rate. In the remaining two cases, unilateral embolization was performed due to anatomical variations and the absence of significant reflux on the contralateral side, as confirmed by venographic assessment. Sclerotherapy with polidocanol was selectively administered prior to coil deployment in nine patients (60%) for persistent periuterine varicosities. However, its routine use was avoided due to theoretical concerns regarding intraoperative venous thrombosis, increased post-procedural pain, and the potential risk of paradoxical embolization in patients with an undiagnosed patent foramen ovale (PFO), as described in previous reports[12]. No adverse events were reported during the procedures. PVCSS scores improved significantly, from a median preoperative value of 20 (IQR: 12.5–21) to 2 (IQR: 1–2.75) within the first postoperative week ($p < 0.001$).

To distinguish the contribution of pain reduction between pelvic and lower extremity venous pathology, we analyzed VAS scores separately for each anatomical region. Significant symptom improvement was observed across all categories at 6- and 12-month follow-ups. Pelvic pain VAS scores decreased from a median of 8 (IQR: 6.75–10) preoperatively to 0 (IQR: 0–1) postoperatively ($p < 0.001$). Dyspareunia improved from 5 (IQR: 2.20–8.25) to 0 (IQR: 0–1) ($p < 0.001$), while dysmenorrhea scores were reduced from 8 (IQR: 7–9.25) to 1 (IQR: 0–1) ($p < 0.001$). Leg pain scores also improved, from 9 (IQR: 9–10) to 1 (IQR: 1–2.5) ($p < 0.001$).

The mean follow-up duration was 17 months (IQR: 11–31 months). Symptom severity, as assessed by PVCSS and VAS, was evaluated at 1-, 6-, and 12-month post-intervention to monitor both short- and mid-term outcomes. Among the 15 patients who underwent ovarian vein embolization, 2 (13.3%) required reintervention due to symptom recurrence at 4 and 6 months, resulting in a reintervention-free survival rate of 86.7%. Notably, both patients had initially undergone unilateral ovarian vein embolization. Although some patients reported an improvement in pelvic pain following treatment of their lower extremity superficial venous reflux, no formal pre- and post-treatment assessment of pelvic pain was conducted. In one case, insufficient occlusion of the right ovarian vein necessitated further intervention. In the second case, embolization of branches from the right hypogastric vein was successfully performed using coil embolization only, without the administration of liquid or foam sclerosants. Although some patients who underwent treatment for SVI reported partial improvement in symptoms, no systematic assessment was performed to determine the independent effect of SVI treatment on pelvic symptoms. This remains a limitation of the study. Among the 15 patients who underwent both embolization and SVI treatment, nine received EVLT combined with ultrasound-guided foam sclerotherapy, and six underwent EVLT followed by phlebectomy. The choice of adjunctive therapy was guided by the extent and size of the remaining varicosities observed after EVLT.

In patients undergoing ovarian vein embolization and SVI treatment, the recurrence rate of SVI was 7% during follow-up. In contrast, patients who declined embolization but received SVI treatment alone had a significantly higher recurrence rate of 23% ($p = .034$), suggesting that PeVD treatment may enhance the durability of SVI interventions.

Discussion

Our study underscores the notable prevalence of symptomatic PeVD in women with SVI, emphasizing the necessity of systematic screening and early diagnosis to optimize patient outcomes. The findings support the use of transvaginal ultrasound as a non-invasive screening modality, with venography serving as the confirmatory diagnostic tool. To our knowledge, few studies have examined the incidence of symptomatic PeVD in patients with SVI.[13,14] Given the well-documented coexistence of PeVD and SVI,[15] our findings reveal a significant incidence of symptomatic PeVD (11%) in women with SVI. This highlights the need for further epidemiological investigations to clarify the pathophysiological link and potential causality between these conditions. To standardize the assessment of PeVD -associated symptoms, we implemented a dedicated questionnaire incorporating the PVCSS and VAS scores for all female patients presenting with SVI.

While MRV is recognized as a valuable imaging modality for PeVD diagnosis, its use in our study was reserved for patients with a high clinical suspicion of concomitant venous compression syndromes (e.g., May-Thurner or Nutcracker syndrome).[16] This approach aligns with current recommendations prioritizing non-invasive first-line imaging such as TVUS.[16] However, routine screening for renal vein or left common iliac vein compression was not performed. Hormonal factors have been implicated in venous pathophysiology, particularly in conditions such as PeVD. While hormonal contraceptives have been associated with vascular changes in prior studies,[17] their direct role in PeVD development remains unclear and warrants further investigation. Internal iliac venography was not systematically conducted, as our primary focus was on ovarian and internal iliac vein reflux. Catheter-directed venogram is the gold standard for diagnosing pelvic venous dilation and confirming the presence of reflux.[18]

Our findings demonstrate that a subset of patients with PeVD and SVI presented with severe symptomatology, as reflected by high baseline VAS scores for pelvic pain. These findings align with previous studies reporting significant symptom burden among patients with PeVD.[19–25] The VAS scores and PVCSS values observed in our cohort were comparable to those reported in previous studies on PeVD-associated CPP, reinforcing the relevance of our findings and the applicability of our screening approach. The observed variation in symptom severity highlights the need for systematic screening and standardized diagnostic criteria in this population. Further research is warranted to explore the natural history of PeVD and its potential impact on venous hemodynamics. Previous studies have demonstrated that symptom severity in PeVD can be objectively assessed using validated pain scales, such as the VAS. The use of VAS in our cohort provided a quantifiable measure of symptom burden, aligning with existing literature that highlights its role in evaluating chronic pelvic pain and venous-related symptoms.[19,20,24,25] Further research is needed to establish standardized pain assessment protocols in PeVD and determine their correlation with objective venous imaging findings. Symptom recurrence in our study was low (5% of patients) with a median follow-up period of 17 (11–31) months, similar to other reports.[19,20,24] Despite the lack of consensus on the necessity of sclerotherapy adjuncts, we refrained from their routine use, particularly given the controversial necessity of cardiac ultrasound screening for open foramen ovale. Although our sample size is limited, it is worth noting that both patients who required reintervention had initially undergone unilateral embolization. While further research is needed, this observation raises the question of whether bilateral embolization might reduce recurrence in some cases.

While our study primarily focused on saphenous vein reflux, future research should investigate whether specific SVI patterns, including non-saphenous varicosities and pelvic escape points, are more frequently associated with PeVD. Identifying such correlations could help refine screening protocols and improve patient selection for further evaluation. Our study did not specifically assess the direct impact of pelvic embolization on leg or vulvar varices, indicating a need to clarify the interplay between these conditions. Limited scientific evidence exists on the relationship between ovarian vein embolization and lower extremity varicose vein outcomes. However, previous reports[19,26] indicate that pelvic vein reflux is more common in patients with recurrent varicose veins (up to 30%) than in those with first-time varicose veins (3%–6%).[27,28] Our findings suggest a potential association between PeVD treatment and symptom relief in some patients. However, definitive evidence supporting a direct impact of PeVD treatment on the long-term durability of SVI interventions remains limited. Further prospective studies are warranted to investigate whether PeVD treatment influences SVI recurrence rates. Further research is required to establish whether PeVD treatment confers additional benefits for the durability of SVI interventions. Franceschi et al. demonstrated that surgical closure of pelvic leakage points effectively treats peripheral varicose veins in patients without determining the potential link between reflux origin and occurrence of varicose vein[29]. Depending on the location of the proximal insufficiency point, it must therefore be assumed that the pressure is diverted via an alternative leakage point in the pelvis after primary closure of a leakage point, which can lead to recurrent varicose veins in the medium to long term.

Our findings indicate that PeVD is frequently observed in patients with recurrent SVI. In our cohort, the recurrence rate of SVI was 23% among patients with untreated PeVD, while it was 7% in those where PeVD was identified and managed. While this may suggest an association, further prospective studies are required to elucidate the exact relationship between PeVD and SVI recurrence. Previous studies have reported a potential association between pelvic venous reflux and recurrent varicose veins of the lower extremities, though definitive evidence remains limited. Evidence indicates that the presence of untreated pelvic venous pathology may contribute to persistent or recurrent lower limb venous symptoms.[7,8,15] However, the precise role of pelvic venous reflux in the recurrence of lower extremity venous insufficiency remains a subject of debate. Further prospective, controlled studies are required to determine whether PeVD treatment directly influences SVI recurrence or if other patient-specific factors contribute to this effect. The mean age of our patients was 44 (±11) years. Although our study cohort was derived from a population with SVI, the prevalence of PeVD (11%) and symptom severity were similar to those reported in studies of patients with CPP,[13,19] suggesting that our screening approach identifies a clinically relevant subgroup. This decision has important clinical implications, as these patients often adapt to venous origin chronic pelvic pain (VO-CPP), undergoing repeated examinations and follow-ups without achieving substantial relief. This hesitancy highlights a broader issue: a general lack of awareness and clinical suspicion of PeVD among gynecologists and primary care physicians. As the first point of contact, these providers play a critical role in identifying potential cases and referring them to specialists for appropriate management. Depending on institutional protocols and regional practice patterns, both vascular surgeons and interventional radiologists are involved in the diagnosis and treatment of PeVD. Previous studies have highlighted a general lack of awareness and clinical suspicion of PeVD among healthcare providers, which may contribute to delayed diagnosis and suboptimal management.[30,31] Increasing provider education and

interdisciplinary collaboration may help improve early recognition and treatment outcomes.

Limitations

This study has several limitations. A key limitation is the use of PVCSS, which, although valuable for assessing symptom burden, is not a validated diagnostic tool for PeVD and lacks specificity in distinguishing venous-origin CPP from other pelvic pain etiologies. Future studies should aim to integrate more robust, validated screening criteria to improve diagnostic accuracy. Additionally, reliance on PVCSS >1 as an inclusion criterion may not optimally capture patients with PeVD. A more robust approach would involve stratifying patients based on ACOG-defined CPP criteria, as the PVCSS is a symptom severity tool rather than a validated screening instrument for PeVD. While it was useful for identifying patients with significant symptom burden, its lack of specificity underscores the need for objective imaging-based confirmation. In our cohort, 37 out of 350 patients (11%) met the ACOG criteria for venous origin chronic pelvic pain (VO-CPP), fulfilling the definition of non-cyclical pelvic pain lasting ≥6 months with significant functional impairment. This subgroup may provide a more clinically relevant representation of PeVD-associated pelvic pain, as opposed to relying solely on symptom severity scoring tools such as PVCSS, which lacks validation as a screening instrument. The retrospective, non-randomized design without a control group limits the generalizability of our findings. Another limitation of this study is that while superficial venous reflux was treated in patients with concurrent SVI and PeVD, its impact on pelvic pain was not independently assessed. Future studies should investigate whether treating SVI alone leads to significant symptom improvement in patients with concurrent PeVD. Additionally, the lack of predefined ultrasound evaluation criteria may have introduced variability in diagnostic assessments. Our study focused solely on symptomatic PeVD, excluding asymptomatic cases, which may exist in the population. Additionally, systematic evaluation for other venous compression syndromes, such as left common iliac vein compression and renal vein compression (Nutcracker syndrome), was not performed. This may have led to underrecognition of concomitant causes of PeVD and limits the generalizability of our findings. While the VAS scale is a useful tool for assessing pain severity, it does not fully capture broader QoL changes. Future studies should consider incorporating validated QoL instruments, such as the Chronic Venous Insufficiency Quality of Life Questionnaire (CIVIQ-20),[32] to provide a more comprehensive evaluation of treatment impact. Lastly, the relatively short follow-up period limited the ability to evaluate long-term recurrence rates for both SVI and PeVD. In addition, the lack of standardized definitions for recurrence in PeVD further constrains the interpretability of these outcomes.

Conclusions

Our study revealed that approximately one in 10 women with SVI also present with symptomatic PeVD, underscoring a clinically relevant association between these conditions. These findings highlight the urgent need for more structured screening strategies and increased clinical awareness of PeVD, particularly in women presenting with chronic venous insufficiency. Given the significant overlap in symptomatology between PeVD and other pelvic pain syndromes, refining diagnostic criteria is essential for improving patient identification and optimizing management strategies. Additionally, our findings emphasize the importance of systematic evaluation of venous pathology beyond the lower extremities. Further research is warranted to investigate the long-term implications of PeVD on SVI recurrence rates and its broader impact on venous hemodynamics and treatment durability. Increasing physician awareness and fostering interdisciplinary collaboration—particularly among vascular specialists, gynecologists, and primary care providers—could lead to earlier diagnosis and more effective patient management, ultimately improving clinical outcomes.

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Guarantor

TB serves as the guarantor for this study, ensuring the integrity and accuracy of the data and analysis presented.

Contributorship

All authors contributed to the conception, design, and execution of the study. TB and CD were responsible for data collection and clinical examinations. TB conducted the statistical analysis. IP was responsible for performing the transvaginal ultrasounds as well as collecting the data. CD and TB contributed to the interpretation of the data and drafting of the manuscript. All authors reviewed and approved the final version of the manuscript.

Ethical statement

Ethical approval

Ethical approval for this study was obtained from the Institutional Review Board of Athens Medical Center, in accordance with the Declaration of Helsinki. All participants provided informed consent prior to their inclusion in the study.

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