



# Pelvic Venous Congestion in the Differential Diagnosis of Chronic Pelvic Pain

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## ABSTRACT

**Objective:** To investigate the frequency of pelvic venous congestion (PVC) in patients with chronic pelvic pain.

**Methods:** In this retrospective study, 171 consecutive patients who underwent sacroiliac magnetic resonance imaging (MRI) or hip MRI for chronic pelvic pain were evaluated in terms of PVC. The presence of parauterine and/or periprostatic varicose veins with diameters of  $\geq 6$  mm was accepted as PVC. The two-tailed significance level was adjusted to  $p < 0.05$ .

**Results:** Of 171 patients, PVC was found in 45 (26.3%). The frequency of PVC was estimated to be 31.8% in women and 16.4% in men. PVC is more common in women than in men ( $p = 0.044$ ; chi-square test). The median age was 35 (19-63) years in patients with PVC.

**Conclusion:** PVC is a frequent pathology that is detected in women and men. PVC should always be considered in the differential diagnosis of chronic pelvic pain.

**Keywords:** Pelvic venous congestion, chronic pelvic pain, dyspareunia

## INTRODUCTION

Pelvic venous congestion (PVC) is defined as enlarged pelvic varicose veins in multiparous premenopausal women. PVC is associated with chronic pelvic pain (1). Pelvic venous drainage has a rich anastomotic network among the internal iliac, ovarian/testicular, and superior rectal veins. The left ovarian and right internal iliac veins are the most commonly affected in PVC. A combined reflux is more common than a single pelvic venous reflux (2, 3). Occasionally, the ovarian and parauterine varicose veins may also be associated with saphenous venous varices due to the rich anastomotic network in the legs (4).

Unilateral obtuse pelvic pain, which can increase due to postural changes or walking, manifests as dyspareunia and postcoital pain. The presence of atypical varicose on the upper part of the perineum or thigh may be another finding. PVC is not often considered a preliminary diagnosis, and it is difficult to detect PVC unless it is kept in mind as the definitive diagnosis (5). Ultrasonography (USG), color Doppler USG, magnetic resonance imaging (MRI), and selective venography are accepted as gold standards for its diagnosis.

The aim of this study was to determine the incidence of PVC in patients with chronic pelvic pain, which is involved in a wide spectrum of diseases, such as rheumatologic diseases, mechanical back pain, hip joint pathologies, and urogenital diseases. In recent years, women with chronic pelvic pain who have no specific diagnosis have been considered for the definitive diagnosis of PVC. Because male patients with chronic pelvic pain have a similar venous anatomic system, they were also included in the present study, considering that PVC could be detected. Our study was performed in patients who underwent pelvic and sacroiliac joint MRI for chronic pelvic pain that lasted longer than 6 months.

## METHODS

After the approval of the ethics committee of our hospital dated January 14, 2015, and numbered 94, 191 consecutive patients who underwent pelvic and sacroiliac joint MRI in the radiology department for chronic pelvic pain between February 2015 and August 2015 were retrospectively examined. Informed consent was not obtained because the study is retrospective. Twenty patients were excluded because the parauterine–periprostatic area could not be adequately imaged in the sacroiliac joint examination. Thus, a total of 171 patients were included in the study.

### MRI Technique

All examinations were performed using the whole body surface bandage on the device 1.5 T MR (Signa HDxt; GE, USA).

**The sacroiliac joint MRI technique:** Axial T1A fast spin echo [FSE; repetition time (TR): 520 ms, echo time (TE): 15 ms, matrix: 320×256, field of view (FOV): 220×220 mm, number of excitations (NEX): 2, fractional anisotropy (FA): 90°, section thickness: 4 mm]; coronal T1A FSE (TR: 420 ms, TE: 15 ms, matrix: 350×192, FOV: 220×220 mm, NEX: 2, FA: 90°, section thickness: 4 mm); axial T2A FSE-fat saturated (fat-sat; TR: 4500 ms, TE: 82 ms, matrix: 320×224, FOV: 220×220 mm, NEX: 2, section thickness: 4 mm); and coronal short tau inversion recovery (TR: 4020 ms, TE: 54 ms, matrix: 288×224, FOV: 220×220 mm, NEX: 2, section thickness: 4 mm).

**Pelvic MRI technique:** Axial T1A FSE (TR: 780 ms, TE: 8 ms, matrix: 320×224, FOV: 400×400 mm, NEX: 2, FA: 90°, section thickness: 4 mm); coronal T1A FSE (TR: 680 ms, TE: 8 ms, matrix: 320×192, FOV: 360×360 mm, NEX: 2, FA: 90°, section thickness: 4 mm); axial proton density (PD) fat-sat (TR: 2880 ms, TE: 39 ms, matrix: 320×224, FOV: 380×380 mm, NEX: 2, section thickness: 4 mm); and coronal PD fat-sat (TR: 2060 ms,



TE: 39 ms, matrix: 320×256, FOV: 360×360 mm, NEX: 2, section thickness: 4 mm).

### Patient Evaluation

Patients included in the study were evaluated for sacroiliitis, hip joint pathology, and PVC. The diagnostic criteria of the Assessment of Spondyloarthritis International Society were used for the diagnosis of sacroiliitis (6). The presence of widespread varicose dilated vein with an out-to-out diameter of  $\geq 6$  mm around the ovary and uterus in female patients (7) and in the periprostatic area in male patients was accepted as a criterion for the diagnosis of PVC.

### Statistical Analysis

Normality control was performed using the Shapiro–Wilk and single sample Kolmogorov–Smirnov tests; a histogram was prepared using the Q-Q plot and box plot graphs. Data were given as mean  $\pm$  standard deviation (SD), median (minimum–maximum), frequency, and percentage. The variables between the two groups were analyzed using the Mann–Whitney U test. Nominal variables were assessed using Fisher's exact probability and Yates corrected chi-square tests. The significance limit was accepted as  $p < 0.05$  and bidirectional. Analyses were performed using the NCSS 10 software.

### RESULTS

Pelvic and sacroiliac joint MRI examinations were retrospectively performed in a total of 171 patients, of whom 100 (64.3%) were females and 61 (35.7%) were males. The median age of all patients was 33 (12–63) years.

Pelvic venous congestion was detected in 45 (26.3%) patients, whereas it was not detected in 126 (73.7%) patients. The incidence of PVC was calculated as 35 (31.8%) in women and 10 (16.4%) in men (Table 1). PVC was more common in women than in men ( $p = 0.044$ ; chi-square test). While the median age was 32.5 (12–63) years in patients without PVC, it was 35 (19–63) years in patients with PVC. The ages of patients with and without PVC were found to be similar ( $p = 0.393$ ; Mann–Whitney U test). However, among patients with PVC, the median age was 35 (22–63) years for women and 24 (19–42) years for men. The age of PVC incidence was statistically significant between both sexes ( $p = 0.03$ ).

When the obstetric history of female patients (35 cases) diagnosed with PVC was evaluated, three patients were found to be nulliparous, and the remaining patients were para 1–6. In a 24-year-old nulliparous patient with PVC, coxalgia and accordingly inflammation around the coccyx and varicose enlargement, especially in the left internal iliac vein, were detected, and this was confirmed by computed tomography venography.

While there were low suspicious findings of sacroiliitis in 12 patients, there were sacroiliitis findings in 13 patients. Sacroiliitis was not detected in the remaining 146 patients. Sex distribution was similar in terms of sacroiliitis ( $p = 0.63$ ; Fisher's exact probability test; Table 2).

A total of 20 patients were evaluated for hip joint pathology in pelvic MRI; mild unilateral coxarthrosis was found in three pa-

**Table 1. Sex distribution of pelvic venous congestion**

Sex	With PVC	Without PVC	Total
Female	75 (68.2%)	35 (31.8%)	110
Male	51 (83.6%)	10 (16.4%)	61
Total	126 (73.7%)	45 (26.3%)	171

PVC: pelvic venous congestion

**Table 2. Sacroiliitis sex distribution**

Sex	With SI	Suspicious findings	SI diagnosis
Female	94 (85.5%)	9 (8.2%)	7 (6.4%)
Male	52 (85.2%)	3 (4.9%)	6 (9.8%)
Total	146 (85.4%)	12 (7%)	13 (7.6%)

SI: sacroiliitis

tients, and widespread bilateral coxarthrosis was found in one patient. Hip joints were evaluated as normal in the other 14 patients.

When all patients were evaluated, PVC was detected in 37 (21.6%) patients without sacroiliitis and hip joint pathology. Although PVC was observed in three patients with suspicious sacroiliitis findings and mild coxarthrosis, three patients were diagnosed with both sacroiliitis and PVC. Only coxarthrosis was detected in one patient. In addition, none of the female patients had an ovary mass or cyst of  $> 20$  mm; myomas of  $< 3$  cm was found in six patients. In eight patients, pelvic free fluid was observed at the physiological limits.

### DISCUSSION

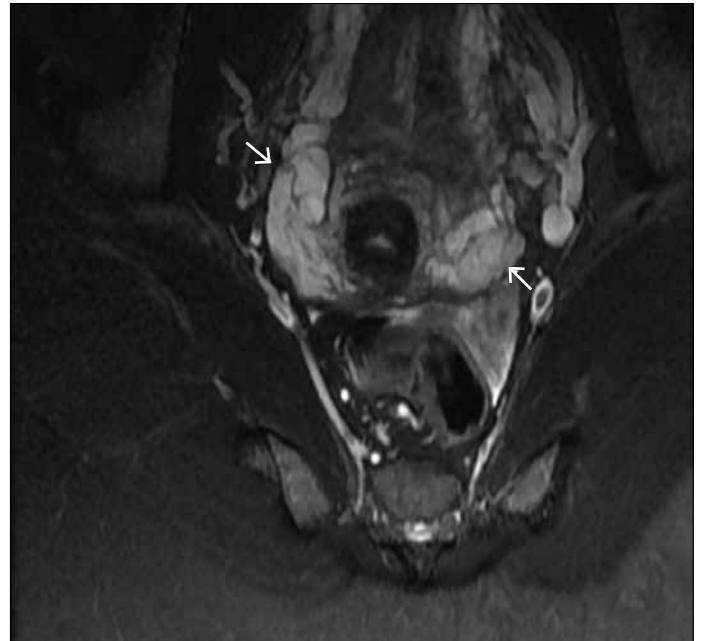
Pelvic venous congestion manifests with chronic obtuse pelvic pain, which is often confused with back pain, hip joint pain, sacroiliitis, and other genitourinary-induced pains. In patients who were examined due to chronic pelvic pain, the PVC frequency should be considered in the definitive diagnosis (8). In contrast, when PVC is not considered for the diagnostic algorithm, it can be easily overlooked in examinations, such as USG and MRI. The reason for choosing patients who underwent pelvic and sacroiliac joint MRI examinations in this study was to evaluate the parauterine area in detail using an FOV in these patients with similar complaints. In the literature, the incidence of pelvic varices has been reported as 10% in all women, and PVC has been reported to develop in 50% of these patients (7, 9). Alternatively, venous varicosity does not always lead to chronic pelvic pain (7). While Park et al. (7) found that the left ovarian vein diameter was  $> 5$  mm in 28 (90.3%) of 31 patients in case-control studies, they found it to be  $> 5$  mm in 16 (45%) patients in the control group of 35 patients. However, they detected varicosity only in four of these 16 healthy patients. When they considered the limit for the ovarian vein diameter as 6 mm, they defined the positive predictive value as 83.3%. Considering the aforementioned study, we specified

the lower limit of the parauterine vein diameter as 6 mm in our study (Figure 1, 2). PVC has frequently been investigated in women in the literature and has been associated with chronic pelvic pain in women. We also included male patients in our study because of similar venous anatomical structures. Hence, PVC was found in 31.8% of women and 16.4% of men who complained of chronic pelvic pain; PVC was more frequently observed in women ( $p=0.044$ ). This difference supports the pregnancy-related hypothesis in the two sexes with similar anatomical structure. The most frequent hypothesis that PVC is frequently found in premenopausal multiparous women is that the vascular capacity in the ovarian–uterine veins has increased 60-fold of normal values during pregnancy (7). Venous insufficiency and varicosity are believed to develop due to excessive increased venous load. Another trigger in pregnancy is the increased uterine pressure on the internal iliac vein. In our study, although PVC was observed more frequently in women, it was found at a rate of 16.4% in men (Figure 3, 4). To the best of our knowledge, this rate is indicated for the first time in the literature. In male patients with chronic pelvic pain, we recommend that the presence of PVC should also be investigated in the definitive diagnosis. We believe that periprostatic and perivesical enlarged varicose veins may lead to lower urinary tract system symptoms secondary to increased inflammation in this region. Studies have investigated the relationship between lower urinary tract symptoms and inflammation (10). In men, it will be beneficial to investigate PVC in chronic pelvic pain in a large series.

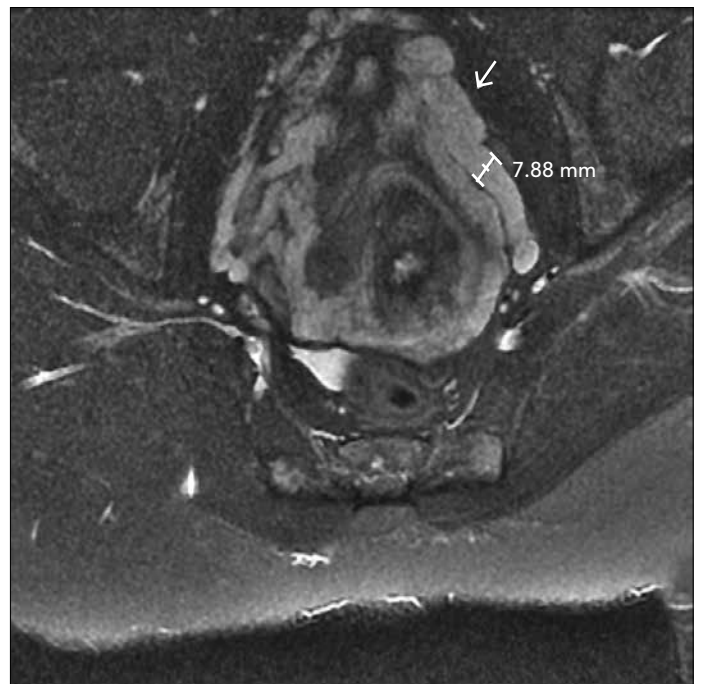
In our study, the mean age of PVC incidence in women was 35 years and it was found to be similar to that in the literature (7). In women, the youngest patient detected with PVC was aged 22 years and para 2. The oldest female patient was aged 63 years, para 4, and in her perimenopausal period. Three female patients were nulliparous. In males, PVC was seen at a younger age. However, we believe that this finding may not be reliable because the age and sex compatibility was not sought in male and female patients in the studied population.

How much does PVC find place in daily clinical practice? How often is it considered and investigated in the definitive diagnosis of patients with chronic pelvic pain? Pelvic varicose enlargement in 21.6% of patients in whom sacroiliitis or hip joint pathology was considered is a crucial finding in the study. In 17% of our patients, there were sacroiliitis findings or suspicion; advanced coxarthrosis was found only in one patient. We believe that PVC should be included in the definitive diagnosis of chronic pelvic pain, and cases should be investigated in this direction.

The fact that PVC is not always associated with pelvic pain is our limitation. In this retrospective study, it is not possible to conclude that the only cause of pelvic pain in our patients is PVC. However, to exclude asymptomatic enlargements in our study, we determined the varicose diameter as 6 mm instead of 5 mm as reported in most studies. Another limitation is the fact that although selective venography is accepted as the gold standard in the diagnosis of PVC, this method was not used in our patients. However, many studies have recently suggested the use of MRI in venous imaging, which is considered to have



**Figure 1.** Axial T2-A FSE-fat-suppressed section in a 34-year-old woman (para 4). Bilateral widespread varicose pakes are observed in the parauterine area.



**Figure 2.** Axial T2-A FSE-fat-suppressed section in a 32-year-old woman (para 2). Bilateral large varicose pakes are observed in the parauterine area and are more widespread on the left side.

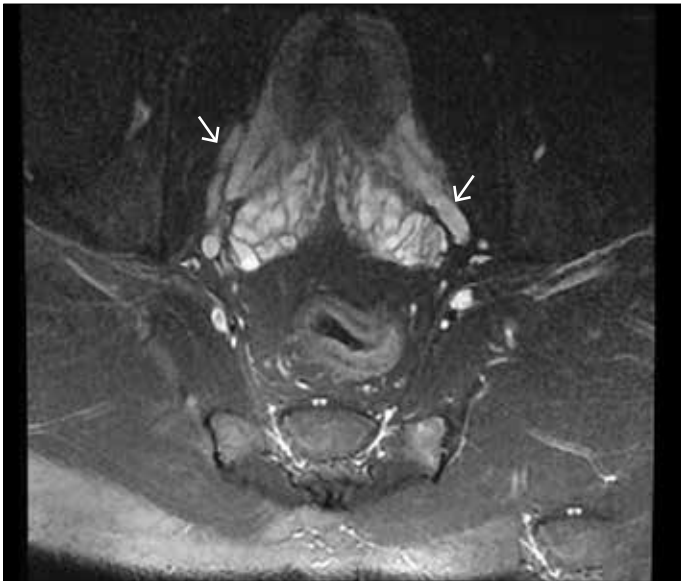
high diagnostic accuracy because it is noninvasive and does not contain radiation.

## CONCLUSION

Pelvic venous congestion is a common pathology not only in women but also in men and should be included in the definitive diagnosis of patients with chronic pelvic pain.



**Figure 3.** Axial T2-A FSE-fat-suppressed section in a 25-year-old male patient. Bilateral widespread varicose veins are observed around the prostate and seminal vesicles (long arrows). In addition, dilation in the seminal vesicle tracts (arrow head) is noted.



**Figure 4.** Axial T2-A FSE-fat-suppressed section in a 21-year-old male patient. Bilateral dilated varicose veins are noted around the prostate and seminal vesicles.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of University of Health Sciences Gaziosmanpaşa Taksim Training and Research Hospital.

**Informed Consent:** Informed consent was not obtained because the study is retrospective.

**Peer-review:** Externally peer-reviewed.

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**Conflict of Interest:** No conflict of interest was declared by the authors.

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