

Pelvic Congestion Syndrome Related Vaginal Bleeding and the Efficacy of Transcatheter Foam Sclerotherapy in Managing This Condition: Two Case Reports

Haikun Yang^{1,2,*}, Yan Zhang^{3,*}, Wen He^{1,4}

¹Meizhou Clinical Institute, Shantou University Medical College, Meizhou, Guangdong Province, People's Republic of China; ²Department of Gynaecology, Meizhou People's Hospital, Meizhou, Guangdong Province, People's Republic of China; ³Department of Radiology, the First People's Hospital of GuiYang, Guiyang, Guizhou Province, People's Republic of China; ⁴Meizhou Academy of Medical Sciences, Meizhou People's Hospital, Meizhou, Guangdong Province, People's Republic of China

*These authors contributed equally to this work

Correspondence: Wen He, Email doctorhoman@163.com

Abstract: Pelvic congestion syndrome (PCS) is a chronic condition primarily characterized by pelvic pain and heaviness, with vaginal bleeding being a rare but significant symptom. We present two cases of PCS-related vaginal bleeding, emphasizing the necessity of considering PCS in differential diagnoses for abnormal vaginal bleeding. A 28-year-old Chinese woman presented with abnormal vaginal bleeding exacerbated by abdominal pressure during activities like squatting or defecation. Imaging revealed a dilated right ovarian vein, and transcatheter venography confirmed Nutcracker syndrome. After undergoing transcatheter foam sclerotherapy, her symptoms resolved. The second case involves a 29-year-old Chinese woman with similar symptoms; imaging and venography identified a dilated left ovarian vein. Following sclerotherapy, her symptoms also alleviated. These cases underscore the importance of recognizing PCS as a potential cause of abnormal vaginal bleeding and demonstrate the efficacy of transcatheter foam sclerotherapy in managing this condition. Integrating clinical presentation with imaging findings is crucial for timely diagnosis and effective treatment, ultimately improving patient outcomes.

Keywords: pelvic congestion syndrome, vaginal bleeding, transcatheter foam sclerotherapy, nutcracker syndrome

Introduction

Pelvic Congestion Syndrome (PCS) is primarily caused by venous insufficiency in the pelvic region, leading to the dilation of veins and resulting in chronic pelvic pain. Characterized by symptoms such as dyspareunia and urinary urgency, PCS predominantly affects women of reproductive age, with studies suggesting a prevalence of 30% among those presenting with chronic pelvic pain.¹ Diagnosing PCS correctly can be challenging due to the variability of symptoms,² limited positive signs during gynecological examinations,³ and the relatively low sensitivity of noninvasive diagnostic imaging.^{4,5} Vaginal bleeding can be mistaken for various conditions, such as abnormal uterine bleeding, vaginitis, and organic uterine lesions. Currently, no reports exist on simple vaginal bleeding caused by PCS, and the clinical features, diagnosis, and treatment of this manifestation remain unknown. In this report, we present two cases of patients with PCS related vaginal bleeding who experienced immediate improvement following foam sclerotherapy of the dilated ovarian veins.

Case Presentation

Case I

A 28-year-old Chinese woman, gravida 4, para 2, presented to our hospital with a predominant complaint of abnormal vaginal bleeding, specifically associated with increased abdominal pressure during activities such as squatting or

defecation, for the past six months. The patient had no significant medical history. Vaginal mucosal bleeding around the urethral opening was observed during the Valsalva maneuver while in the bladder lithotomy position. The gynecological examination revealed no abnormalities. The urinalysis, routine blood test, and coagulation test results were all normal. Transvaginal color Doppler ultrasound showed normal findings of the uterus and bilateral adnexa. Subsequently, a vascular computed tomography (CT) scan was performed, revealing a diameter of 7 mm for the right ovarian vein, as well as the tortuous dilation of associated parauterine and internal urethral orifice veins on the same side. Based on the patient's clinical history and the findings from the vascular CT, she received a diagnosis of PCS. The patient underwent transcatheter foam sclerotherapy via interventional radiology on May, 2022.

To assess the potential presence of pelvic varices, contralateral selective venography was conducted. The procedure involved the utilization of a 5F catheter to puncture the right femoral vein using an 18-gauge needle. It was determined that the patient's left renal vein exhibited narrowing prior to its descent into the inferior vena cava, resulting in a diagnosis of Nutcracker syndrome (Figure 1). Transcatheter venography further validated the presence of a dilated right ovarian vein and retrograde ovarian vein reflux. Just before administration, polidocanol was mixed with air at a ratio of 1:3, resulting in a total volume of 12 mL, and subsequently administered as a foam sclerosing agent. Subsequently, the APT micro-catheter was inserted into the right ovarian vein under X-ray fluoroscopy, and the polidocanol foam was then administered. A control venography was conducted to confirm the complete occlusion of the right ovarian varices (Figure 1). The patient experienced a satisfactory recovery and was discharged one day following the operation. Importantly, there have been no recurring instances of abnormal vaginal bleeding thus far.

Case 2

A 29-year-old gravida 1, para 1 Chinese woman presented at our hospital with a chief complaint similar to that of the patient discussed in case 1 over the past month. The patient had an unremarkable medical history. Physical examinations revealed no abnormalities, except for vaginal mucosal bleeding around the urethral opening during the Valsalva maneuver. Urinalysis, routine blood tests, and coagulation tests were all within normal range. Doppler vascular ultrasound showed characteristic findings of Nutcracker syndrome, while vascular CT scans indicated a left ovarian vein diameter of 6 mm. Based on the patient's clinical history and the findings from the vascular ultrasound and CT scans, a diagnosis of PCS and Nutcracker syndrome was made. The patient underwent transcatheter foam sclerotherapy for the left ovarian vein via interventional radiology on May, 2023 (Figure 2), following the same surgical procedure as that performed on patient 1. Similarly, the symptoms of patient 2 disappeared after the surgery, and she was discharged 1 day postoperatively. There has been no recurrence thus far, and the patient continues to be closely.

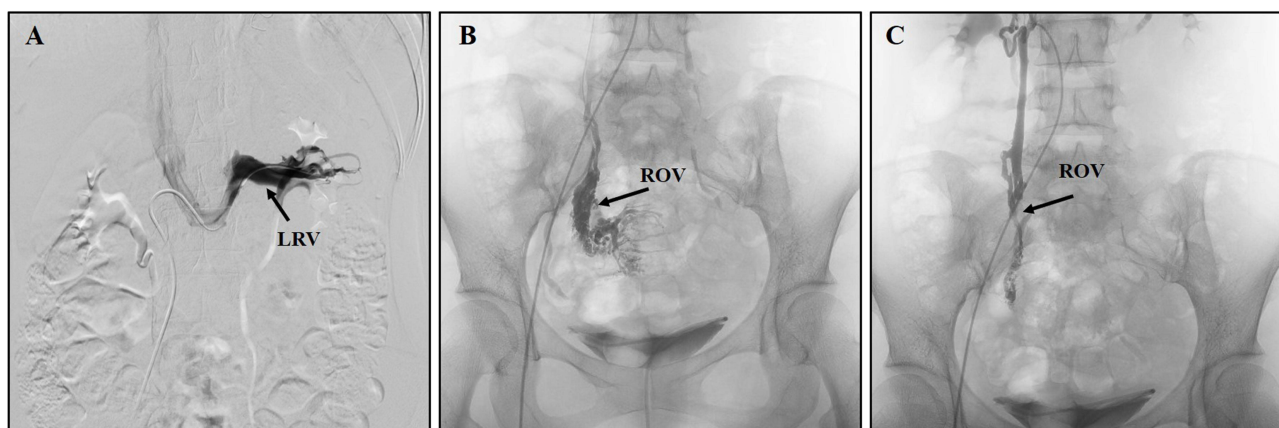


Figure 1 Imaging manifestations of case 1 before and after endovascular embolization. **A.** Nutcracker syndrome, digital subtraction angiography reveals compression of the LRV. **B.** Before endovascular embolization, digital subtraction angiography reveals dilation of ROV. **C.** Right ovarian venography after injection of polidocanol showing complete occlusion of the right pelvic varices. LRV, left renal vein; ROV, right ovarian vein.

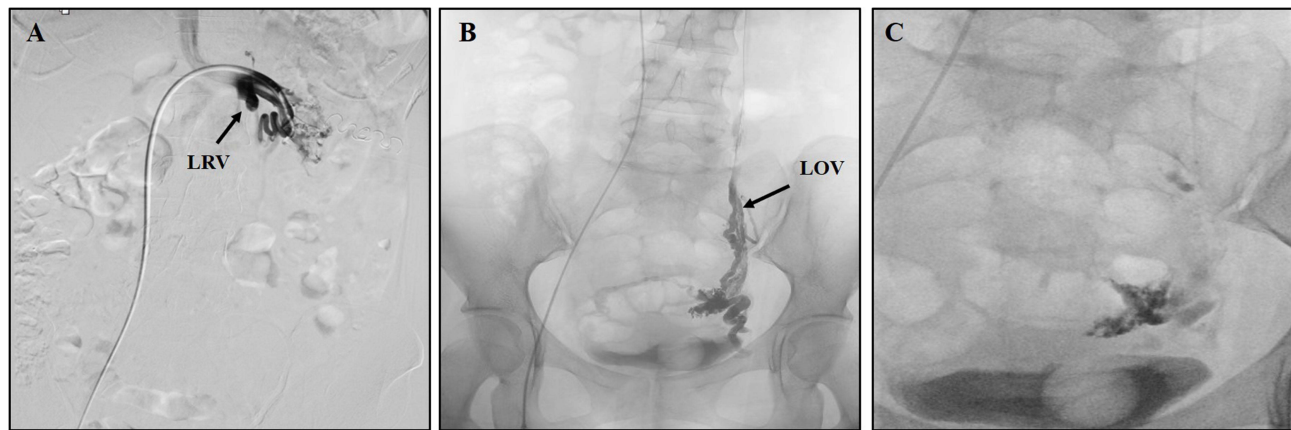


Figure 2 Imaging manifestations of case 2 before and after endovascular embolization. **A.** Nutcracker syndrome, digital subtraction angiography reveals compression of the LRV. **B.** Before endovascular embolization, digital subtraction angiography reveals dilation of LOV. **C.** Left ovarian venography after injection of polidocanol showing complete occlusion of the left pelvic varices. LRV, left renal vein; LOV, left ovarian vein.

Discussion

PCS is one of the underdiagnosed diseases associated with chronic pelvic pain in female patients.^{1,6} The presence of abnormal vaginal bleeding alone is rare, and making a diagnosis of PCS based solely on this symptom is challenging. This study represents the first reported cases linking abnormal vaginal bleeding to PCS, providing valuable insights for gynecologists to improve the diagnosis and management of PCS-related vaginal bleeding.

Mechanical and hormonal factors are believed to contribute to the development of PCS. The mechanical cause of PCS is typically associated with intrinsic vein disorders, which result in venous dilatation and dysfunction. Existing literature highlights that most vein disorders are identified in the ovarian vein, with approximately 60% of these cases ultimately leading to PCS.⁷ In case 2, the major cause of the left dilated ovarian vein is likely Nutcracker Syndrome, which is recognized as one of the primary contributing factors.⁸ Additionally, variations in pelvic vasculature exist among individuals.⁹ In case 1, during contralateral selective venography, it was observed that the left ovarian vein was absent, while the right ovarian vein demonstrated dilation and venous stasis, despite the presence of Nutcracker Syndrome. Moreover, the increased estrogen levels during the previous pregnancies of both cases may have further intensified ovarian vein dilation.¹⁰ These mechanical and hormonal factors were consistently observed in both cases.

The peculiar aspect of our cases revolved around the uncharacteristic symptom exhibited by the patients. To determine the cause, we conducted reproductive tract ultrasound, blood tests, and leukorrhea examination to exclude common diseases associated with vaginal bleeding. Ultimately, based on the findings from vascular CT, we preliminarily diagnosed PCS before the surgery. Furthermore, employing vascular ultrasound aided in identifying any pelvic and abdominal vascular abnormalities, enabling real-time evaluation of blood flow and assisting in subsequent diagnostic and treatment procedures.⁶

Several treatment modalities, including medical, surgical, and endovascular approaches, are available for treating PCS.¹¹ Hormonal medications are often the initial choice as they can reduce blood flow to the dilated vein, in line with the theory implicating estrogen in PCS development. However, hormonal medications such as gonadotropin-releasing hormone agonists or medroxyprogesterone acetate can result in climacteric syndrome. Based on our cases, hormonal medications may not be the most appropriate treatment for young PCS patients. In contrast, there is emerging evidence indicating that endovascular therapy may be the optimal treatment for PCS.¹² Endovascular treatment is a minimally invasive method for embolizing the dilated veins, avoiding potential surgical damage to the ovarian reserve and pelvic vascular bed. Notably, transcatheter venography performed prior to endovascular treatment is considered the gold standard for diagnosing PCS and allows visualization of the most dilated vein and other vascular malformations. According to studies on endovascular treatment for PCS, embolization is recommended as an effective treatment.¹³ Additionally, research findings suggest that there is no statistically significant difference between unilateral and bilateral ovarian vein embolization.¹⁴ The present two cases were treated with unilateral ovarian vein embolization using polidocanol. Both patients experienced a cessation of vaginal bleeding, indicating the effectiveness of the embolization treatment.

Conclusion

In conclusion, we present two rare cases of PCS accompanied by abnormal vaginal bleeding. Both patients achieved successful treatment through transcatheter embolotherapy of the unilateral ovarian vein. Given the rarity of such cases, it is crucial for gynecologists to be aware that PCS can potentially be the underlying cause for abnormal vaginal bleeding and that endovascular embolization can serve as a safe and effective therapy for this condition.

Data Sharing Statement

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

Ethical Approval

The patient gave informed consent for treatment and publication of this case report. Approval by the Medical Ethics Committee of Meizhou People's Hospital was received for publication of this case report (2024-C-128). The patient gave written informed consent for this case report and any related images to be published.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

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