Lower Extremity Deep Venous Thrombosis Caused by Internal Iliac Artery Pseudoaneurysm: A Case Report

Shaobo Cao, Rentao Wang, Dile Wang, Min Hu, Tao He*

Department of Vascular Surgery, The Central Hospital of Wuhan, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China

***Correspondence:** Tao He, Department of Vascular Surgery, The Central Hospital of Wuhan, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430014, China.
E-Mail: 13507186847@163.com

Abstract

Introduction: To report a rare case of right iliac vein compression syndrome (IVCS) and secondary right lower extremity deep venous thrombosis (DVT) caused by internal iliac artery pseudoaneurysm (IIPA), and summarize the diagnosis and minimally invasive endovascular treatment experience.

Case Presentation: We retrospectively analyzed a 70-year-old female patient with right lower limb edema, fever and pain. Laboratory and imaging examinations confirmed right deep venous thrombosis and a compressive right IIPA. After endovascular therapy, anticoagulants and antibiotics were given, and routine imaging follow-up was conducted.

Results: Favorable clinical and angiographic results were achieved. The IIPA resolved completely, right hydronephrosis subsided, and both DVT and iliac venous stenosis improved significantly. No major complications occurred during follow-up.

Discussion: This rare case supplements limited literature on IIPA-induced right-sided IVCS-DVT. It recommends pelvic imaging for patients presenting with unexplained right°sided DVT and endorses endovascular intervention. In contrast to technically challenging open surgery, endovascular therapy offers the advantages of minimal trauma and faster recovery. Additional evidence is still needed to formulate standardized treatment protocols for this rare clinical entity.

Conclusion: Right IVCS and DVT induced by IIPA are extremely rare clinical conditions. Endovascular therapy is safe and effective for this disease, which can relieve vascular compression and thrombotic symptoms and achieve a satisfactory long-term outcome. However, this conclusion remains to be verified by more clinical studies.

Keywords: Internal iliac artery pseudoaneurysm; Iliac vein compression syndrome; Deep venous thrombosis; Endovascular treatment

Introduction

Lower extremity deep-vein thrombosis (DVT) is a prevalent condition in clinical practice, with an annual incidence ranging from approximately 1‰ to 2‰. Inadequate duration of anticoagulant therapy and

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irreversible thrombotic triggers are significant factors contributing to the recurrence of DVT[1]. Iliac vein compression syndrome (IVCS), a rare etiology of DVT, involves the compression of the left iliofemoral vein by the right common iliac artery against the vertebral body. This condition induces left lower limb DVT and chronic venous insufficiency, predominantly on the left side, and is also referred to as May-Thurner syndrome. However, right-sided IVCS is exceedingly uncommon[2]. Internal iliac pseudoaneurysm (IIPA) is an infrequent occurrence in clinical practice, with trauma, iatrogenic factors, infections, immune responses, and congenital conditions being potential etiological factors[2]. This paper presents a case of IIPA resulting in right IVCS and right DVT of the lower limb. The objective is to consolidate the center's experience in diagnosing and treating this condition, enhance awareness, and minimize the risk of misdiagnosis and missed diagnosis. The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of The Central Hospital of Wuhan (approval number: WHZXKYL2026-061).

Case presentation

A 70-year-old female patient was admitted to the Department of Vascular Surgery at Wuhan Central Hospital on February 20, 2022, following a one-month history of edema in the lower right limb. Approximately one week prior to admission, the patient developed a fever, increased edema in the lower limbs, and swelling and pain in the right lower extremity and buttocks. The patient was a non-smoker and had no prior history of hepatitis, tuberculosis, surgery, trauma, or valvular disease. Her medical history included comorbidities such as hypertension, type 2 diabetes mellitus, and lumbar disc herniation. Notably, the patient had undergone acupuncture treatment in the lower abdomen and groin area one month prior, as part of a traditional Chinese medical therapy.

Upon physical examination, the patient presented with a body temperature of 37.6°C, a heart rate of 87 beats per minute, a respiratory rate of 18 breaths per minute, and a blood pressure reading of 180/70 mmHg. Notably, there was severe edema in the right lower limb, whereas the left lower limb exhibited no edema. The circumference of the right thigh measured 54 cm, compared to 44 cm on the left. Similarly, the right calf circumference was 44 cm, while the left calf measured 36 cm (Figure 1a). The skin tension was markedly elevated in the right lower limb. Laboratory investigations revealed the following results: C-reactive protein at 7.8 mg/L, procalcitonin at 0.15 ng/dL, white blood cell count at 8.51 × 10^9/L, neutrophil percentage at 77.2%, hemoglobin at 79 g/L, D-dimer at 4.0 µg/mL, and creatinine at 110.4 µmol/L. Blood cultures were negative for bacterial growth. A Doppler ultrasound of the lower limbs identified thrombosis in the right femoropopliteal vein. Incidentally, a computed tomography (CT) scan of the pelvic cavity was conducted, revealing a mass in the right pelvic region (Figure 2). Subsequent gynecological ultrasound indicated significant blood flow within the mass, suggesting a pseudoaneurysm of the internal iliac artery (IIPA). Further evaluation with computed tomography angiography (CTA) demonstrated an isolated internal iliac pseudoaneurysm (measuring 7.8 cm × 7.1 cm × 9.0 cm) and effusion in the upper segment of the ureter. Compression of the local iliac vein and ureter was observed, resulting in obscured visualization (Figure 3).

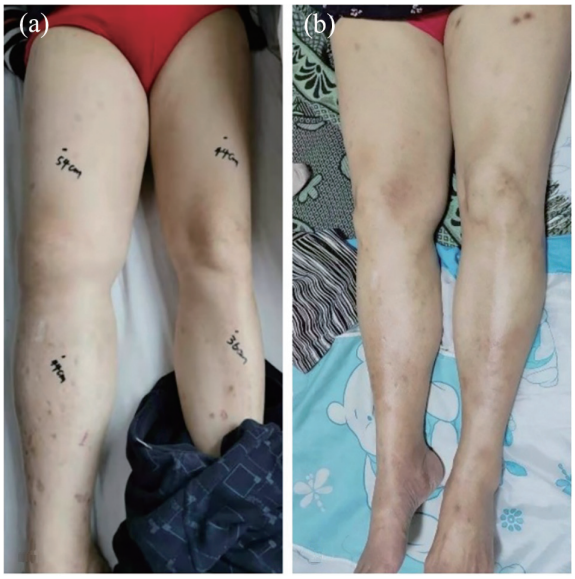

Figure 1: Lower limb images.

(a) Right lower limb edema on admission. (b) The edema in the right lower limb had resolved by the one-year follow-up.

During her hospitalization, the patient was administered enoxaparin calcium at a dosage of 6000 AxaIU twice

Figure 2: Computed tomography (CT) scan revealing a mass in the right pelvic region.

Figure 3: Computed tomography angiography (CTA) demonstrated an isolated internal iliac pseudoaneurysm and effusion in the upper segment of the ureter.

daily and ceftriaxone sodium hydrate at 2,000 mg per day. After seven days, her temperature and infection indices normalized, allowing for surgical intervention. A Denali (Bard, Tempe, Arizona) retrievable inferior vena cava (IVC) filter was deployed via the left femoral vein to mitigate the risk of pulmonary embolism. A coil (Bocelli, China) was implanted in the right IIPA, and a VIABAHN 11 mm × 10 cm covered stent (GORE Corporation, USA) was placed in the right common iliac artery. Post-procedure angiography confirmed the resolution of the internal iliac aneurysm. Venography of the right lower extremity revealed significant compression of the right common iliac vein, with 90%–100% luminal stenosis, likely due to compression from a pseudoaneurysm of the right IIPA (Figure 4). Postoperatively, the patient received oral rivaroxaban at a dose of 20 mg once daily for three months, followed by rivaroxaban 10 mg per day for 1 year. In addition, the patient was administered broadspectrum oral antibiotics for six weeks. Two months after the initial surgery, inferior vena cava filter retrieval was performed.

Results

At the two-month follow-up, computed tomographic angiography (CTA) indicated a reduction in the size of the right IIPA pseudotumor (measuring 7.3 cm × 3.9 cm) (Figure 5a), along with a significant decrease in density compared to preoperative assessments. The patient reported no pain or edema in the right lower limb (Figure 1b). One year postoperatively, CTA confirmed the complete resolution of the right IIPA pseudotumor (Figure 5b). Furthermore, ultrasound findings indicated the resolution of right hydronephrosis and an improvement in the stenosis of the deep and iliac veins in the right lower limb. At the final follow-up visit in the fourth year after the initial surgery, the patient showed no evidence of lower-limb deep vein thrombosis or pseudoaneurysm recurrence throughout the follow-up period.

Discussion

IVCS is an infrequent etiology of DVT, with occurrences in the right lower limb being exceptionally rare[3]. A CT scan upon admission identified a pseudoaneurysm of the right IIPA as the causative factor for the right-sided IVCS, which subsequently led to the development of DVT in the right lower limb. Such cases are seldom documented in both domestic and international literature.

Traditionally, IIPA pseudoaneurysms have been managed through open surgical procedures, with aneurysmectomy, local debridement, and graft replacement[4]. However, open surgical intervention for vascular

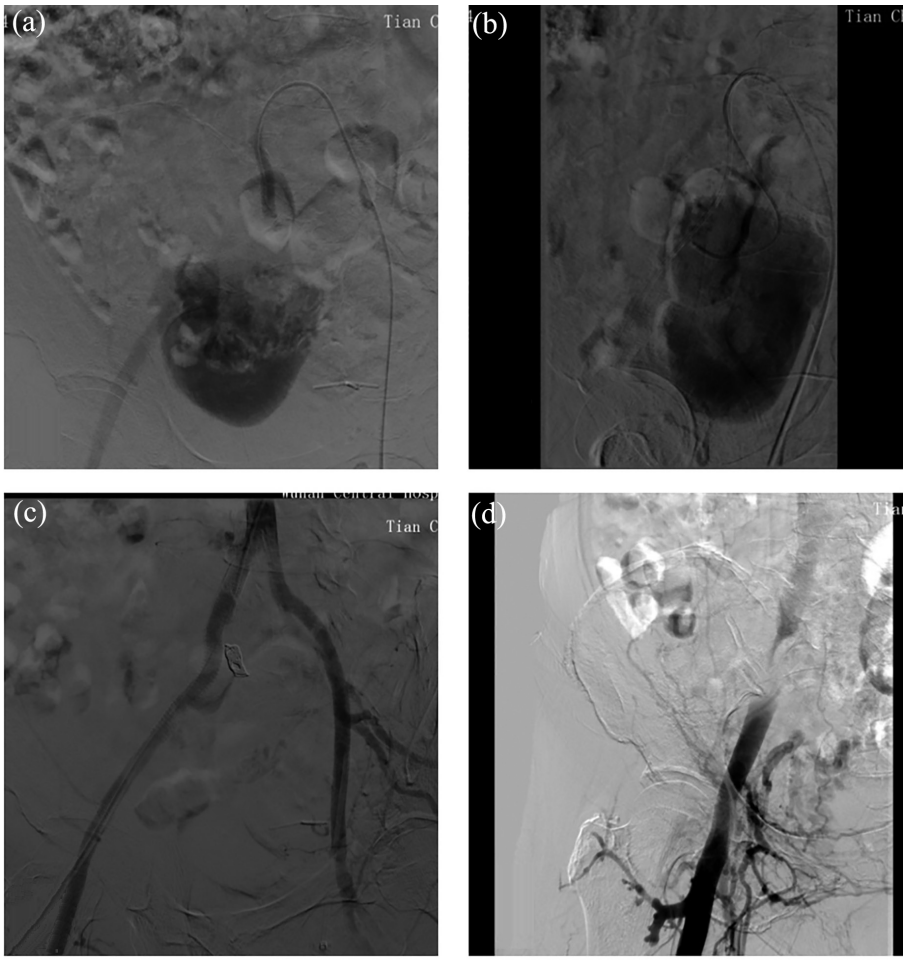

Figure 4: Endovascular therapy.

(a) A pseudoaneurysm in the right internal iliac artery. (b) Oblique view of the pseudoaneurysm. (c) The pseudoaneurysm showed no contrast enhancement after stent placement and coil embolization. (d) The internal iliac pseudoaneurysm (IIPA) resulting in right iliac vein compression syndrome and occlusion of the common iliac vein.

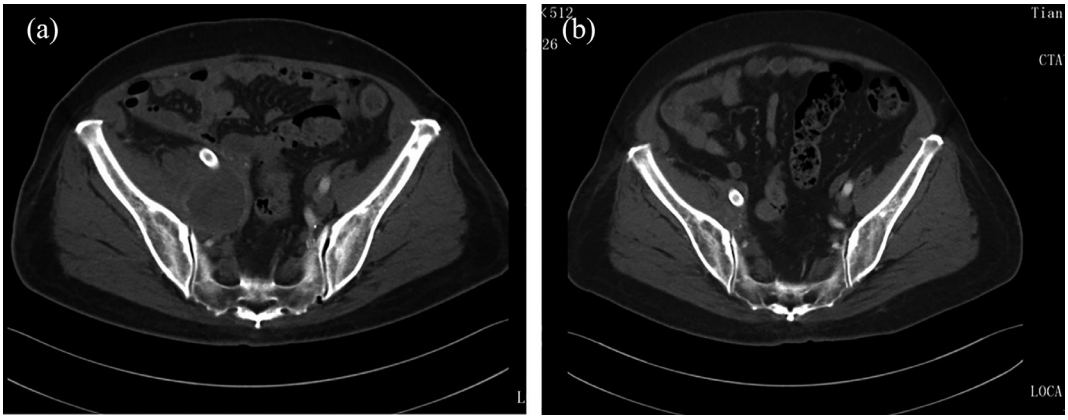

Figure 5: Follow-up computed tomography angiography (CTA) images.

(a) The IIPA has demonstrated a reduction in both size and density at two-month follow-up CTA. (b) The IIPA has resolved, and the iliac artery stent remains patent by the one-year follow-up CTA.

exposure in cases of IIPA pseudoaneurysms presents significant challenges, including technical difficulty, substantial blood loss, and heightened risk of severe complications, which can result in catastrophic outcomes. In the present case, a treatment strategy involving "endovascular repair with a covered stent combined with coil embolization" was employed, yielding a favorable therapeutic outcome.

The potential for postoperative stent infection should be thoroughly considered in the endosurgical management of pseudoaneurysms[5]. A multicenter study on isolated infected iliac artery aneurysms (IIIAAs) indicated that endovascular treatment is a feasible, safe, and effective approach for the management of IIIAAs[6]. Previous studies also demonstrated that endovascular therapy is a viable, less invasive option for pseudoaneurysms, with fewer surgical complications and acceptable efficacy[7–9]. The patient received broad-spectrum antibiotics for six weeks before and after the procedure, and no infection was detected over a 48-month period. Currently, there is no consensus on the optimal duration of antibiotic treatment for infections associated with infected pseudoaneurysms[10].

For the management of DVT in the right lower limb and ipsilateral IVCS, the primary interventions employed were anticoagulation therapy and lower limb pressure therapy. After embolization for pseudoaneurysm, iliac vein compression lessens, enhancing venous return in the legs. If compression symptoms persist, secondary IVCS intervention may be considered during follow-up. Over the course of follow-up, there was a notable improvement in symptoms of lower limb edema, and a review conducted two months post-surgery revealed a reduction in tumor size. CTA performed one-year post-surgery demonstrated complete tumor absorption, with resolution of DVT and hydronephrosis. Consequently, the need for iliac vein stent implantation of the right lower limb was obviated, thereby reducing the patient's economic burden.

Conclusion

Currently, the therapeutic approaches for IVCS and DVT induced by IIPA are primarily informed by a limited number of case reports, and no standardized treatment protocol has been established. The authors posit that a combination of lumen repair and coil embolization represents a viable minimally invasive treatment strategy.

Author contributions

Tao He conceived the study, supervised the project, and is the corresponding author. Shaobo Cao designed the study, collected and curated the data, and drafted the manuscript. Rentao Wang, Min Hu and Dile Wang contributed to data interpretation and critically revised the manuscript. All authors read and approved the final manuscript.

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Conflict of interest

The authors declare no conflict of interest.

Ethics statement

This study was approved by the Ethics Committee of The Central Hospital of Wuhan, China (approval No. WHZXKYL2026-061, approval date 2026-03-31). The ethics committee approved a waiver of written patient informed consent. This study was conducted in accordance with the Declaration of Helsinki.

Data availability statement

No datasets were generated or analyzed for this work.

AI statement

No AI use: The authors declare that no generative artificial intelligence (AI) or AI-assisted technologies were used in the preparation, analysis, or writing of this manuscript.

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