Arch Argent Pediatr. 2026;e202510971

Recurrent deep vein thrombosis in an adolescent

Ayelén Samarro[1], *María A. Segura*[1], *Cecilia Robledo*[1]

ABSTRACT

Deep vein thrombosis (DVT) in children, although rare, has shown an increase in incidence associated with a rise in risk factors.

We report the case of a 17-year-old female patient with recurrent thrombosis complicated by pulmonary thromboembolism and post-thrombotic syndrome. Several risk factors were identified, including age, a sedentary lifestyle, use of combined oral contraceptives, a heterozygous mutation in factor V Leiden, and May-Thurner syndrome.

This case highlights the need for a multidisciplinary approach to the treatment of pediatric DVT and the importance of implementing measures for the prevention and early diagnosis of post-thrombotic syndrome.

Keywords: *deep vein thrombosis; post-thrombotic syndrome; thrombophilia; pulmonary embolism; May-Thurner syndrome.*

doi: http://dx.doi.org/10.5546/aap.2025-10971.eng

To cite: Samarro A, Segura MA, Robledo C. Recurrent deep vein thrombosis in an adolescent. *Arch Argent Pediatr.* 2026;e202510971. Online ahead of print 13-AUG-2026.

[1] *Pediatric Clinic, Hospital General de Niños Ricardo Gutiérrez, Autonomous City of Buenos Aires, Argentina.*

Correspondence to *Ayelén Samarro: ayesamarro@gmail.com*

Funding*: None.*

Conflict of interest*: None.*

Received*: 11-26-2025*
Accepted*: 6-10-2026*

INTRODUCTION

Deep vein thrombosis (DVT) in children is a rare condition. Still, cases have increased in recent decades due to the growing prevalence of risk factors such as a sedentary lifestyle, hypertension, and the use of oral contraceptives (OCs). Although there are no precise local data on its incidence, some studies suggest a 3- to 10-fold increase in its frequency.[1,2]

We present the case of an adolescent with recurrent DVT, in whom multiple risk factors for thrombosis were identified, and who developed pulmonary thromboembolism (PTE) and post-thrombotic syndrome (PTS) as complications. Through this case report, we aim to highlight the diagnostic evaluation and treatment of patients with thrombosis, which is complex and requires an interdisciplinary approach.

CLINICAL CASE

A 17-year-old adolescent presented to the emergency department with precordial pain and shortness of breath. She also reported that five days before her visit, she had begun experiencing pain in her left lower limb that made it difficult for her to walk.

As background, she had been on anticoagulant therapy with acenocoumarol for a DVT episode that occurred 6 months ago. At that time, she was taking combined oral contraceptives (OCs), which were discontinued after that episode. Her INR levels were within the therapeutic range during follow-up. She had no other relevant personal or family history.

On physical examination, she was in good general condition, with a normal heart rate, normal breathing, and was hemodynamically stable. She reported dyspnea, crushing chest pain, and pain in the calf region of her left lower limb, with positive Homans', Olow's, and Payr's signs. Cardiac auscultation revealed no murmurs or arrhythmias.

Given the suspicion of a new episode of DVT, a Doppler ultrasound was performed on both limbs, which revealed the presence of a thrombus in a collateral vein of the left external gastrocnemius vein with the gastricnemius vein having recanalized. With a diagnosis of recurrent DVT, despite the patient already receiving appropriate anticoagulant therapy, it was decided to admit the patient to the hospital. The following tests were ordered: complete blood count, coagulation panel (INR 2.9), D-dimer, electrocardiogram, echocardiogram, and chest X-ray, all within normal limits. Due to suspicion of pulmonary thromboembolism (PTE), a chest computed tomography (CT) scan was performed, which showed no findings consistent with PTE. The patient resumed follow-up with the Hematology Department, and her anticoagulant therapy was switched to low-molecular-weight heparin (LMWH).

The patient showed a favorable clinical course, with ultrasound evidence of recanalization of the vessel at 10 days. Subsequently, an MRI angiogram and CT angiogram of the left lower extremity were performed, revealing no signs of thrombosis or obvious anatomical abnormalities.

The differential diagnoses considered as causes of thrombophilia included rheumatological disease, paraneoplastic syndrome, and hereditary thrombophilias.

Laboratory tests were ordered for antiphospholipid antibodies, anti-DNA antibodies, and anti-ENA antibodies, all of which were negative. The results of the immunological profile, including immunoglobulin and complement levels, were normal for the patient's age.

To rule out a paraneoplastic syndrome, abdominal and pelvic CT scans, a gynecological ultrasound, and a thyroid ultrasound were performed; all results were normal. Blood tests for tumor markers (alpha-fetoprotein and β-hCG) were ordered and came back negative.

Finally, genetic testing to screen for hereditary thrombophilias revealed a heterozygous mutation for factor V Leiden (FVL).

After three weeks of effective treatment with LMWH, the patient again presented with pain in the same limb, accompanied by functional impairment without edema and functional class III dyspnea, with a positive walk test and hypoxemia. A new chest CT angiogram was performed, which showed findings suggestive of a pulmonary embolism (PE) in the right segmental lobar artery. A pulmonary perfusion scintigram was also ordered, which showed heterogeneous tracer uptake, confirming the diagnosis. An echocardiogram ruled out signs of pulmonary hypertension.

It was decided to place an inferior vena cava filter via catheterization. During the procedure, cavography revealed extrinsic compression of the left common iliac vein by the right common iliac artery, with the development of perivertebral collaterals—findings consistent with May-Thurner syndrome (*Figures 1 and 2*). After one month of treatment, the patient showed a favorable

clinical course, with follow-up imaging confirming recanalization of the vessels; consequently, it was decided to remove the vena cava filter and switch the anticoagulation therapy to acenocoumarol.

Although she did not develop any new thrombotic events, the patient continued to experience recurrent pain in her left lower limb, leading to a diagnosis of post-thrombotic syndrome. Physical therapy, compression bandaging, and analgesics were prescribed, but the therapeutic response was minimal. Finally, catheter-based balloon angioplasty was performed, with stents placed in the inferior vena cava and the left iliac vein (*Figure 3*). Due to the placement of these intravascular devices, antiplatelet therapy with acetylsalicylic acid and clopidogrel was prescribed.

The patient responded well to the procedure and continued follow-up on an outpatient basis. To date, she remains asymptomatic and has not experienced any new complications.

DISCUSSION

We describe the case of an adolescent female patient with recurrent thrombosis, whose known risk factors at the time of admission were age, a sedentary lifestyle, and the use of combined oral contraceptives, which were discontinued following the first event. The recurrence and development of PTE prompted a thorough search for other associated factors. Among these, a heterozygous mutation for FVL was identified. The prevalence of this mutation ranges from 1% to 8.5% for the homozygous phenotype and from 3% to 5% for the heterozygous mutation. The presence of the heterozygous mutation increases the prevalence of DVT by up to 18% in individuals who have had previous thrombotic episodes. Furthermore, a multiplicative effect has been observed when it is combined with other risk factors, such as the use of OACs and pregnancy.[3-5]

Combined oral contraceptives (COCs) affect hemostasis by increasing levels of procoagulant factors (fibrinogen and factors II, VII, VIII, and X) and reducing levels of coagulation inhibitors (antithrombin III and the tissue factor pathway inhibitor). The coexistence of thrombophilia and the use of combined OACs increases the risk of DVT, which is approximately three times higher compared to women who do not use them. Some studies have reported that this risk decreases three months after discontinuing their use.[6] In

Figures 1 and 2. Cavography

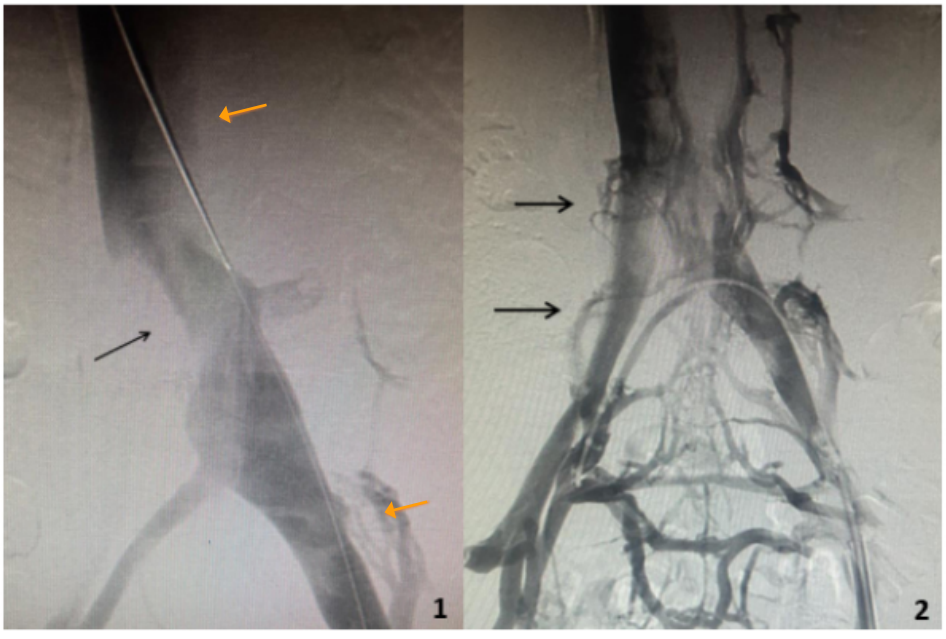
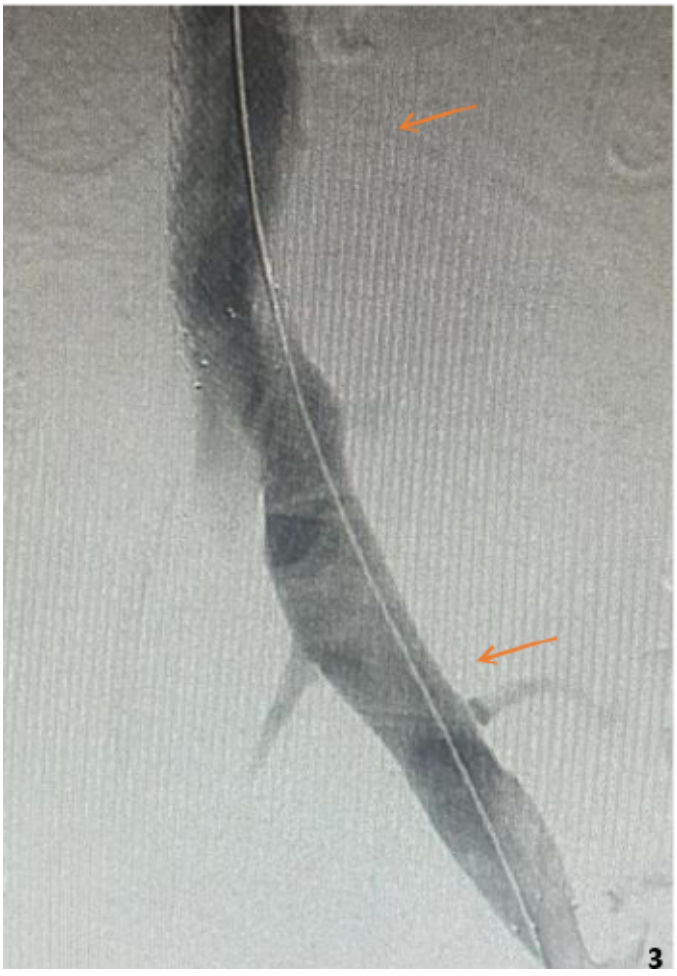


Figure 1: The compression of the common iliac vein by the right common iliac artery (black arrow) is visible; this finding is characteristic of May-Thurner syndrome. The orange arrows point to the inferior vena cava and the iliac vein.
Figure 2: Presence of collateral circulation.

Figure 3. Cavography following stent placement



Restoration of blood flow is observed following the angioplasty and stent placement procedure in the iliac vein. The orange arrows point to the inferior vena cava and the iliac vein.

this case, the OACs had been discontinued three months earlier, and this history was considered an additional risk factor. Regarding the combination of both factors, the literature reports an incidence of approximately 28 thrombotic events per 1000 women per year.[4,6]

The patient also presented with an anatomical abnormality known as May-Thurner syndrome, defined by compression of the external iliac vein by the right common iliac artery. This condition is more common in women, especially adolescents, and is associated with PTE in up to 17% of cases.[7] As a complication, the patient developed post-thrombotic syndrome (PTS), a manifestation of venous insufficiency secondary to chronic venous hypertension. The Manco-Johnson scale is a validated tool for diagnosis, with a reported incidence of 33% during follow-up of patients with DVT.[8] Characteristic symptoms include pain, edema, dilation of superficial collateral veins, and even the presence of venous ulcers. In the case described, the main symptom was pain that was difficult to control, requiring long-term treatment with morphine and improving with the placement of stents via catheterization. Among the prognostic factors for the development of PTS are obesity and the presence of elevated biomarker levels (IL-6 and D-dimer) three months after diagnosis. At the same time, the use of compression stockings and thrombolysis appears to be protective factors.[8]

The case described illustrates the complexity of evaluating and treating patients with recurrent thrombosis, who require a multidisciplinary

approach and a thorough investigation of any associated predisposing risk factors. Further research on this topic is needed to understand the interactions among the various factors, which could lead to the development of treatment and prevention strategies tailored to each patient. Furthermore, it is important to emphasize the significance of post-thrombotic syndrome, which is associated with high morbidity due to chronic pain but can be prevented through simple measures and early diagnosis. ■

Acknowledgments

The authors would like to thank Dr. Eduardo Galli for his generous cooperation in providing the images of the patient's hemodynamic procedure, which contributed significantly to the preparation and documentation of this case report.

REFERENCES

1. Raffini L, Huang YS, Witmer C, Feudtner C. Dramatic increase in venous thromboembolism in children's hospitals in the United States from 2001 to 2007. *Pediatrics*. 2009;124(4):1001-8. doi:10.1542/peds.2009-0768.
2. Schwalb G. Tromboembolismo venoso en Pediatría: avances en los últimos años. *Hematología*. 2018;22(Extraordinario, XIII Congreso del Grupo CAHT):225-30.
3. Young G, Albisetti M, Bonduel M, Brandao L, Chan A, Friedrichs F, et al. Impact of inherited thrombophilia on venous thromboembolism in children: a systematic review and meta-analysis of observational studies. *Circulation*. 2008;118(13):1373-82. doi:10.1161/CIRCULATIONAHA.108.789008.
4. Campello E, Spiezia L, Simioni P. Diagnosis and management of factor V Leiden. *Expert Rev Hematol.* 2016;9(12):1139-49. doi:10.1080/17474086.2016.1249364.
5. Trenor CC, III, Bauer KA. Inherited disorders of thrombosis and fibrinolysis. In Orkin SH, Fisher DE, Look AT, Lux SE, Ginsburg D, Nathan DG (Eds.). Nathan & Oski's hematology of infancy and childhood. 7th ed. Philadelphia: Saunders Elsevier. 2008:1062-75.
6. Gumpel CG. Anticoncepción en la mujer con TEV o con trombofilia sin TEV previo. *Hematología*. 2018;22(Extraordinario, XIII Congreso del Grupo CAHT):110-6.
7. Avila L, Cullinan N, White M, Gaballah M, Cahill AM, Warad D, et. al. Pediatric May-Thurner Syndrome-Systematic review and individual patient data meta-analysis. *J Thromb Haemost.* 2021;19(5):1283-93. doi:10.1111/jth.15284.
8. Goldenberg NA, Donadini MP, Kahn SR, Crowther M, Kenet G, Nowak-Göttl U, et. al. Post-thrombotic syndrome in children: a systematic review of frequency of occurrence, validity of outcome measures, and prognostic factors. *Haematologica*. 2010;95(11):1952-9. doi:10.3324/haematol.2010.026989.