

# “What IVC?”: Deep Vein Thrombosis in the Context of IVC Dysgenesis

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## Introduction

22-year-old male with a medical history of scoliosis, presented to the emergency department with a nine-day history of left inguinal pain and left lower extremity pain, most prominent in the upper thigh. He reported a visible swelling which started around the same time as left-sided pain. The patient describes the pain as a left-sided “heaviness” that radiates to the level of the left popliteal fossa. The patient first noticed the pain while lifting weights at the gym and that the pain became worse with movement.

The patient reported an onset of foamy urine within prior weeks.

On physical examination, patient demonstrated reproducible pain to palpation of the left thigh and inguinal region, increased pain with motion of the left hip, and swelling of the left lower extremity down to the popliteal fossa. The remainder of the physical examination was within normal limits.

## Objectives

The clinical team works to understand the epidemiology of this deep vein thrombosis (DVT), the impact on the patient’s life, and the best treatment for this rare case.

## Results

- A venous duplex ultrasound found an extensive occlusive thrombus within the left common femoral vein as well as the proximal and mid portions of the femoral vein.
- May-Thurner’s syndrome was suspected, and a CT venogram was ordered – the patient was found not to have MTS.
- Patient was found to lack a normal suprarenal IVC.
- The DVT stretched into the external iliac vein (see Figures 1 & 2).
- The imaging also demonstrated multiple small venous collaterals throughout the retroperitoneum and pelvis.

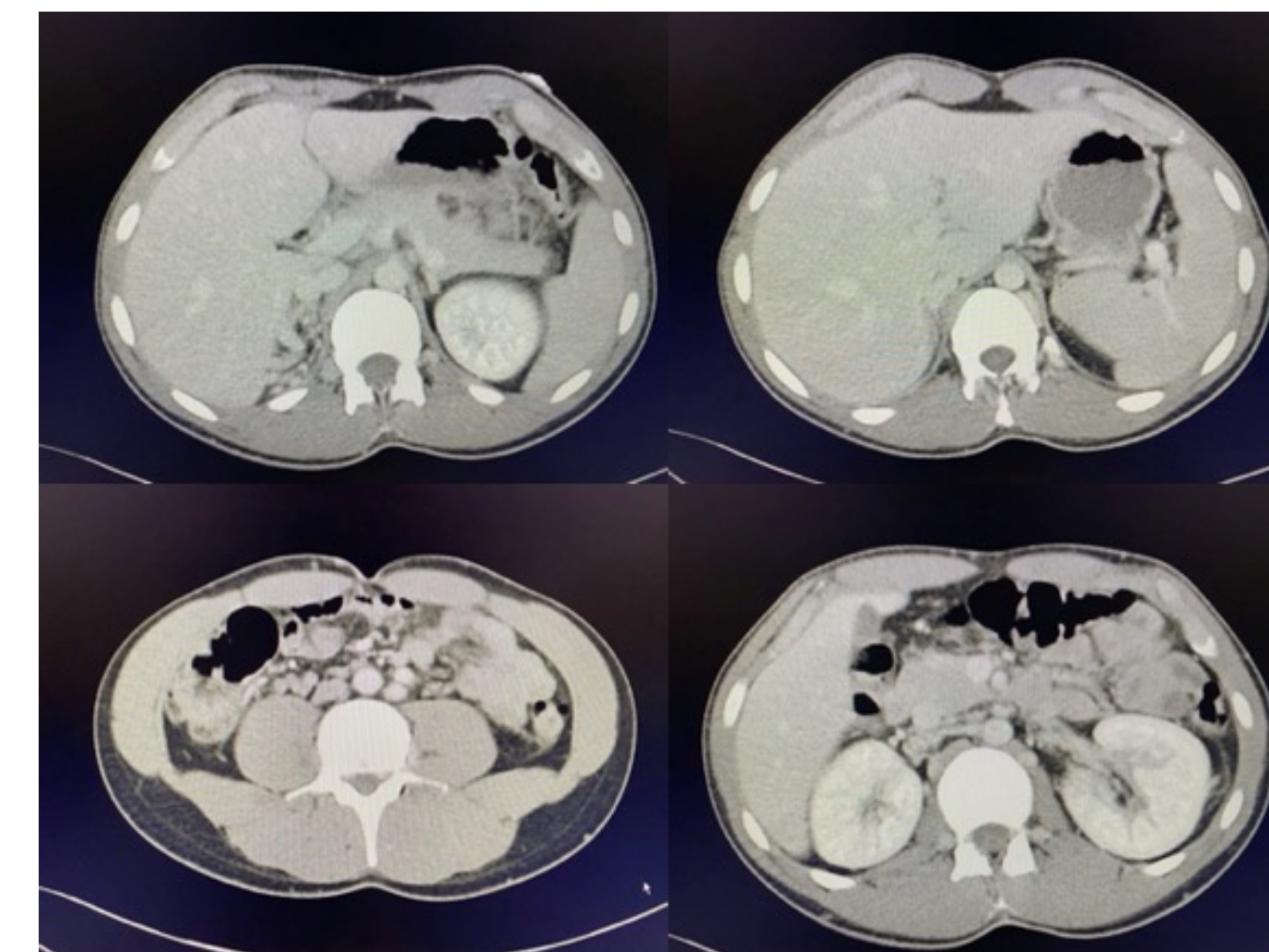


Figure 1. Axial view of the abdomen from the CT venogram. In this image, it is clear there is no visible suprarenal inferior vena cava, however, the abdominal aorta and the infrarenal inferior vena cava are visible.

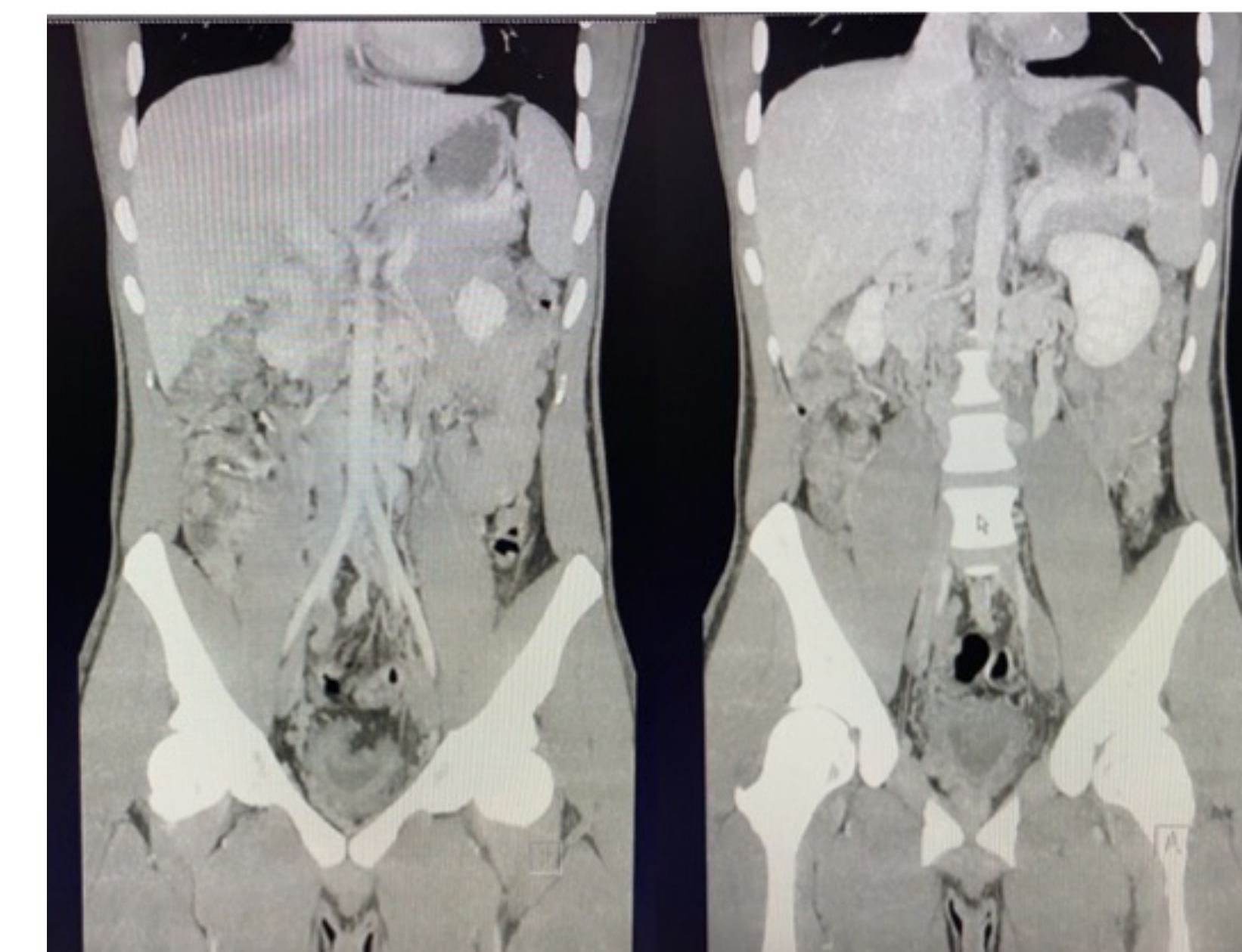


Figure 2. This coronal view of the CT venogram also demonstrates the abdominal aorta and the infrarenal inferior vena cava. As can be seen, there is no discernible suprarenal inferior vena cava.

## Treatment

- Based on the history, physical examination, laboratory testing, and imaging studies, the patient was determined to have a DVT.
- The hematology/oncology & interventional radiology teams recommended a thrombectomy of the DVT.
- The patient started lifelong oral anticoagulation to prevent future DVTs.
- Imaging during the IR procedure (see Figure 3) determined that the patient has a well-developed retroperitoneal collateral system.

## Discussion & Conclusions

- **First clinical pearl:** Anomalous IVC conditions are estimated to be between 5.3% and 9.5% [1-3]. Agenesis is one of the rarest possible IVC anomalies, with one estimate being between 0.0005% to 1% of the general population [4-5].
- **Second clinical pearl:** Inpatient testing might have been tempting, but it would likely not alter the patient’s treatment.
  - This is known as *value-based care* - performing tests only based on what will change clinical practice.
  - Taking into consideration the cost for the patient, often increased in the in-patient setting [6].
- **Third clinical pearl:** The absence of his suprarenal IVC and the subsequent development of the collateral venous drainage system demonstrates the body’s ability to adapt to environmental challenges, both intrinsic and extrinsic. This anatomical deviation and compensation are not uncommon and similar findings have been found in several other vascular structures to a lesser extent [7-9].

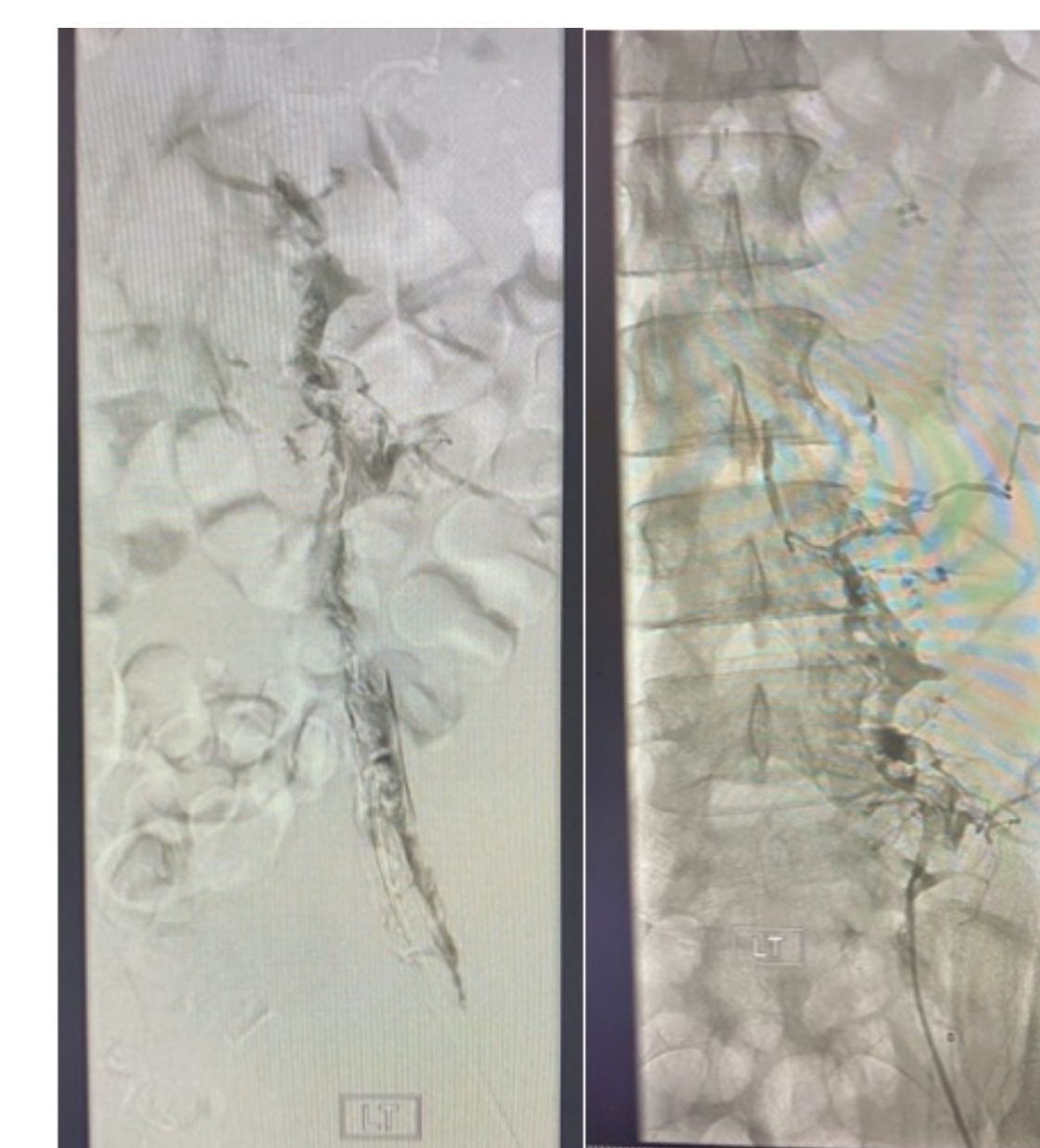


Figure 3. This venogram demonstrates the filling defect from the right sided external iliac vein and some of the collateral flow of blood back to systemic circulation.

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