

## INTRODUCTION

- This poster describes an educational case of a recurring left-sided deep vein thrombosis (DVT) due to the presence of May-Thurner Syndrome.
- The patient initially had a left lower limb ultrasound Doppler which was positive for a DVT. The patient also had a CT on the same day which was positive for a pulmonary embolism (PE).
- Despite being treated with anti-coagulation therapy to treat the DVT and PE, the patient returned months later with recurrent positive DVTs.
- A combination of CT and ultrasound diagnosed the rare condition that is May-Thurner syndrome.
- Systemic anticoagulation alone was insufficient treatment for treating DVTs in the May-Thurner patient as seen in this case, as a more aggressive approach (stenting) was needed to prevent recurrent DVT (Knutninen et al., 2017).
- Ultrasound technique had to be modified in this case for follow-up scans as the patient had a venous stent in place from the left iliac vein to the common femoral vein and compression was not possible.
- This poster will educate on the rare syndrome that is May-Thurner (or Cocketts syndrome): its clinical presentation, imaging findings and sonographic modification of technique.

## MAY-THURNER SYNDROME

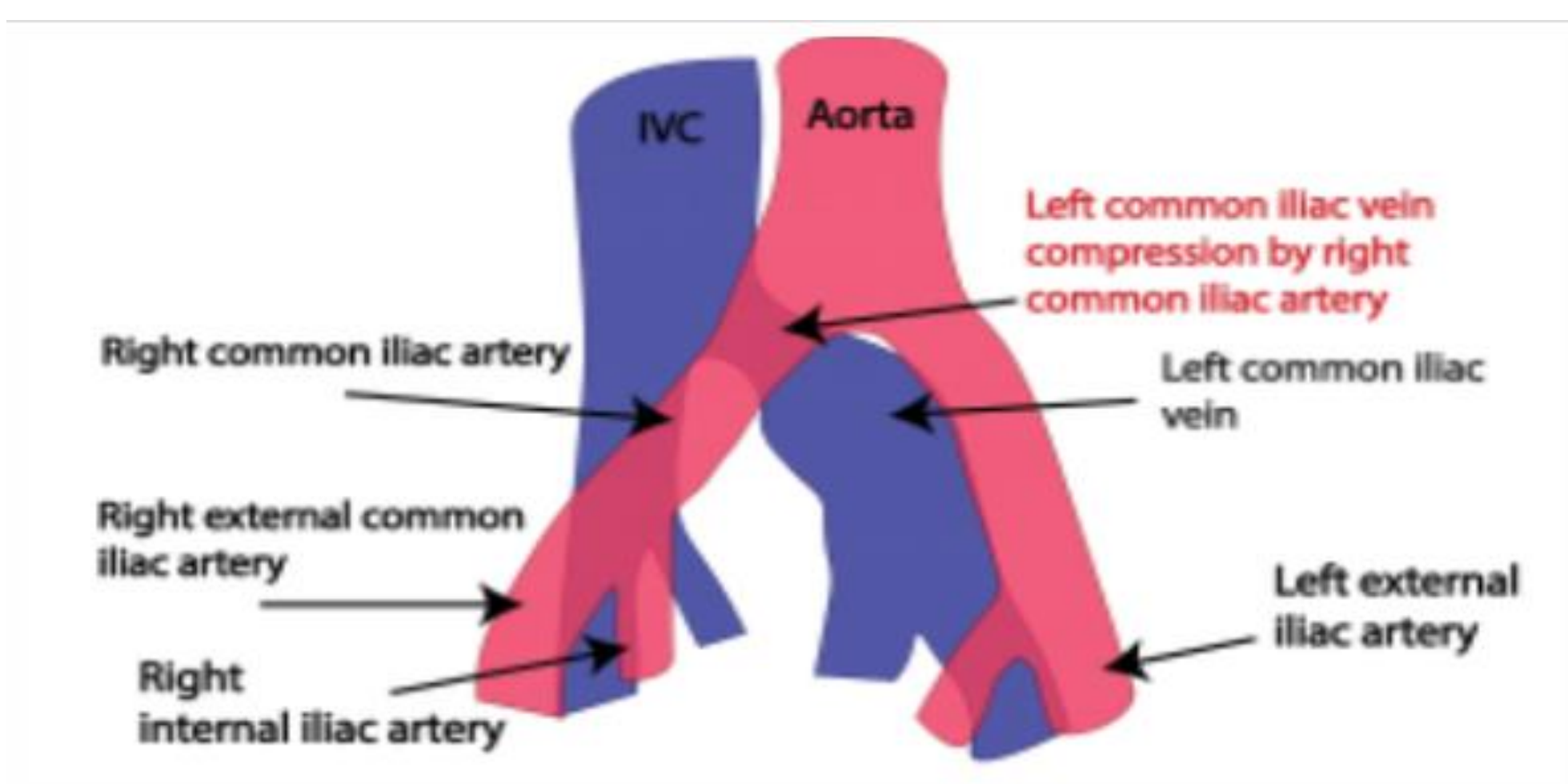


Figure 1. Anatomy explaining May-Thurner syndrome: showing the left common iliac vein being compressed by the right common iliac artery (Sun and Song, 2021).

- May-Thurner syndrome was first described in 1957 by Dr. May and Dr. Thurner. It is also known as Cockett syndrome (Sun and Song, 2021).
- It describes the chronic compression of the left iliac vein against the lumbar spine by the overriding right common iliac artery (Knutninen et al., 2017). In the cases of an unexplained DVT, iliac vein compression syndrome could be considered.
- Patients with May-Thurner syndrome can be completely asymptomatic or they may present with heaviness in the leg, leg fatigue and leg swelling and there may be visible varicose veins present. Less common symptoms can include pelvic pain, groin pain, and lower back pain, which may be more noticeable on the left side of the body (Sun and Song, 2021).

## PATIENT BACKGROUND

- This 56 year old female presented to the Medical Assessment Unit with significant left lower leg swelling and bruising, D-Dimers 39.9, ultrasound Doppler left lower limb was requested to rule out a deep vein thrombosis (DVT). She had no history of previous DVT or pulmonary embolism (pulmonary embolism).
- The patient had no known risk factors for DVT. Risk factors can include active cancer, trauma, major surgery, hospitalisation, periods of immobilisation causing reduced blood flow (which can include long distance travel), pregnancy or the use of the oral contraceptive pill (Li et al., 2022).
- The patient was given a Wells score of 2. The Well's criteria is a clinical scoring tool used in the prediction and diagnosis of pulmonary embolism and deep vein thrombosis and has been summarised in Table 1, based on Modi et al., (2016).
- In this case, as the patient had swelling of the entire leg (+1 point), pain on palpation of the deep veins (+1 point), a diameter difference on the affected calf (+1 point) and dilated superficial veins (+1 point), but could have had an alternative diagnosis at least as possible as DVT (-2 points) the Wells score was 2. This put the patient in a moderate risk for DVT based on the Well's criteria (Modi et al., 2016).

Table 1: Well's criteria (Modi et al., 2016).

Well's score for DVT Items	Points
Cancer	+1
Paralysis or recent plaster cast	+1
Bed rest for more than three days or surgery less than 4 weeks ago	+1
Pain on palpation of deep veins	+1
Swelling of entire leg	+1
Diameter difference on affected calf >3cm	+1
Pitting oedema (affected side only)	+1
Dilated superficial veins (affected side)	+1
Alternative diagnosis at least as possible as DVT	-2
<b>Clinical Probability</b>	
Low probability	0
Intermediate	1-2
High probability	>=3

This patient also had elevated D-Dimer levels of 39.9. Typical D-Dimer range is between 0-0.50 milligrams per litre (mg/L) in the blood. D-Dimer is a protein fragment the body produces when a blood clot dissolves. The D-Dimer is a highly sensitive but non-specific test (Modi et al., 2016).

- The patient had no relevant imaging history.

## ULTRASOUND EXAMINATION

- First Presentation:** An ultrasound left lower limb Doppler was performed and this showed extensive deep vein thrombosis involving the left common femoral, left femoral, left popliteal veins with extensive calf vein (anterior tibial, posterior tibial and peroneal veins).

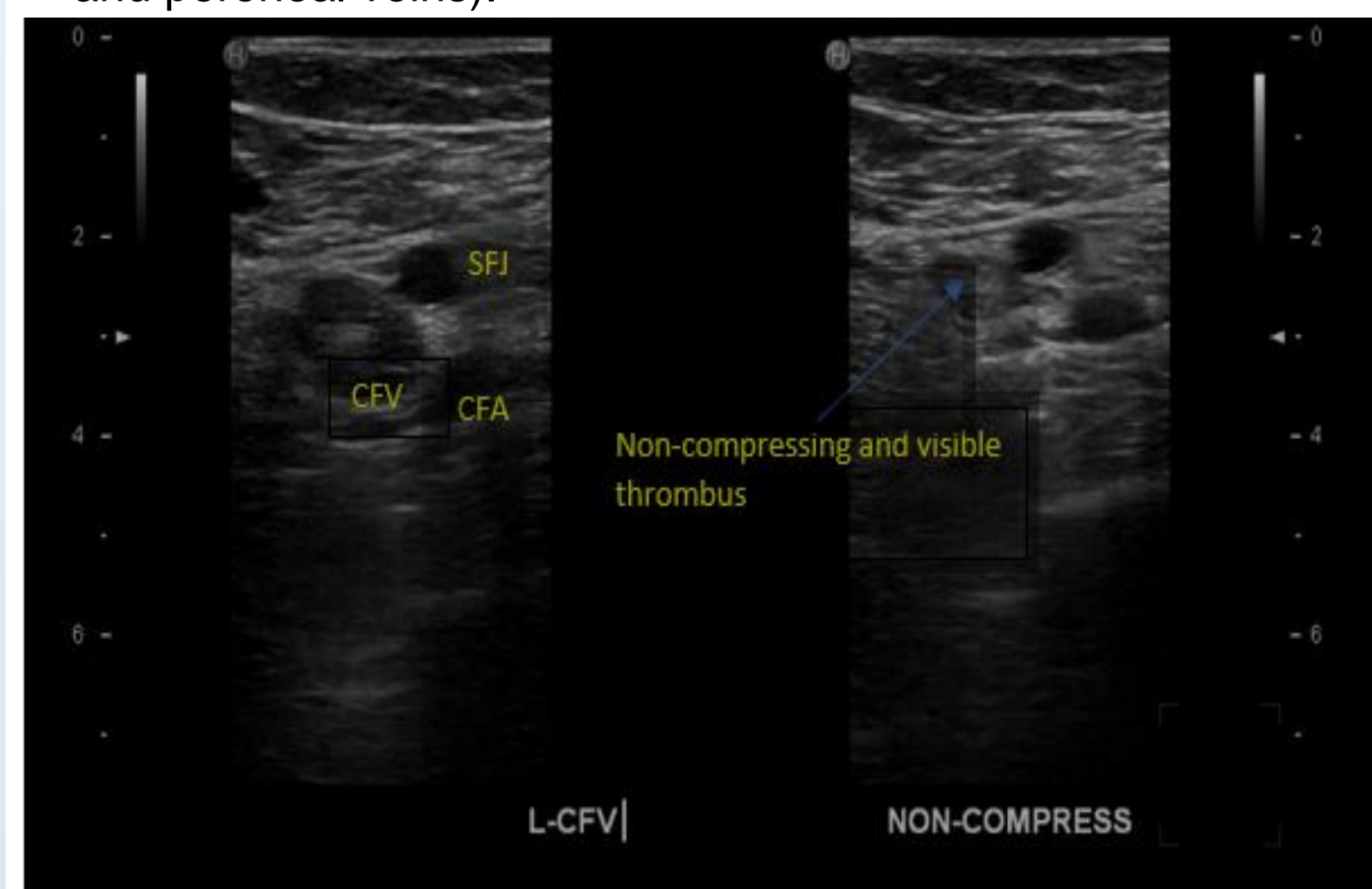


Figure 2: Compression of Left common femoral vein shows evidence of a DVT with no compression of the vein (Hospital X).

- A CT thorax/abdomen/pelvis was performed the same day to query an occult malignancy due to the confirmed unprovoked DVT. Patient had no known risk factors for a DVT.
- This CT was positive for a small left-sided pulmonary embolism and a deep vein thrombosis involving the left external iliac, left common femoral vein, profunda femoral veins with trace thrombus at the bifurcation of the inferior vena cava.

### Second Presentation

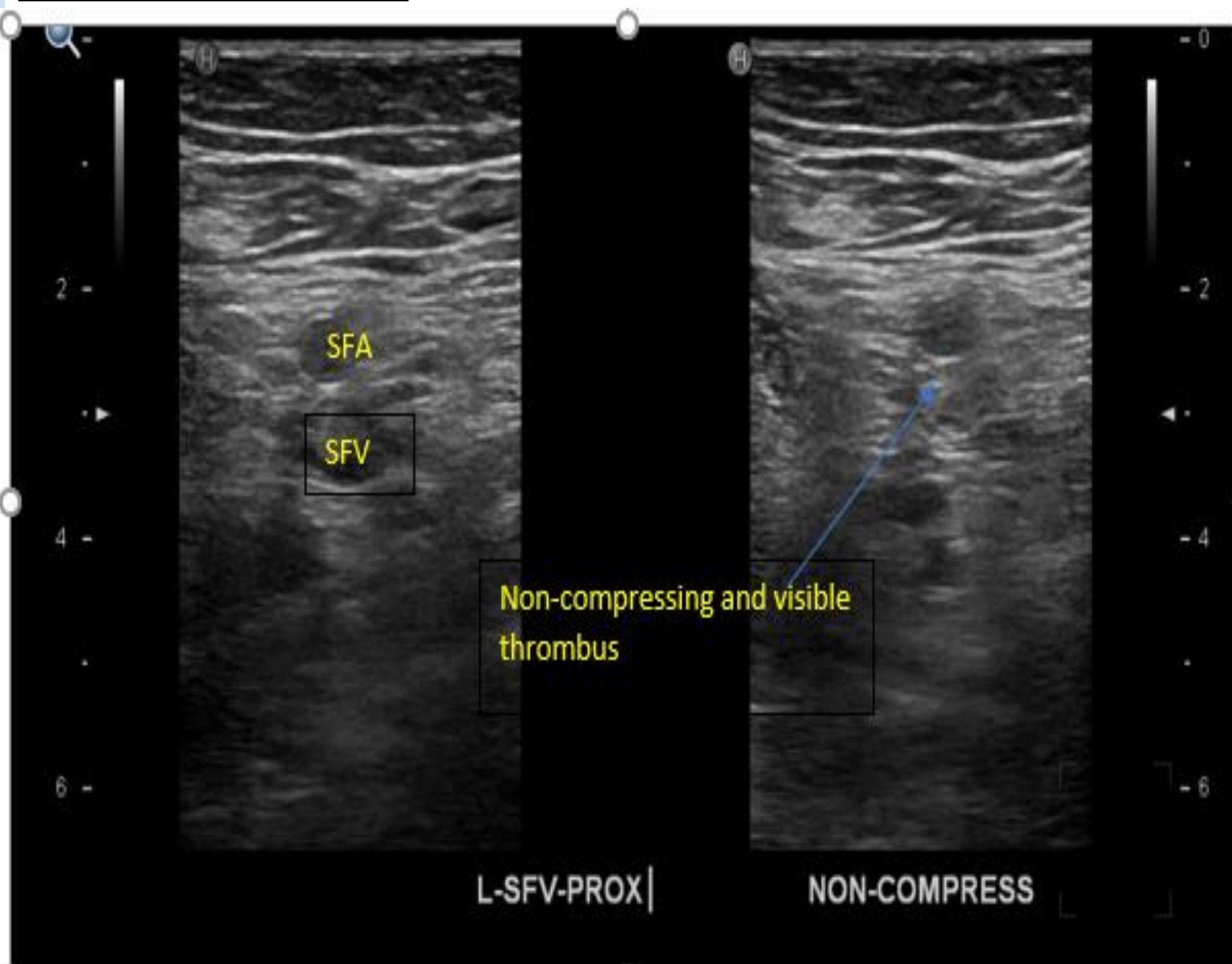


Figure 3: Again showing non compressible thrombus evident within the proximal superficial femoral vein.

- The patient presented again to the Medical Assessment Unit 6 months later with left leg swelling and pain and was referred for ultrasound Doppler.
- The mid and distal superficial femoral veins and the left popliteal veins were non compressible and there was a visible clot seen.
- The veins were not particularly distended so the report said that the DVT may be acute or chronic.
- The patient went on to have CT lower limb angiogram which confirmed the presence of a DVT and this angiogram confirmed the presence of May-Thurner syndrome.
- The patient was referred to a vascular centre in the west of Ireland.

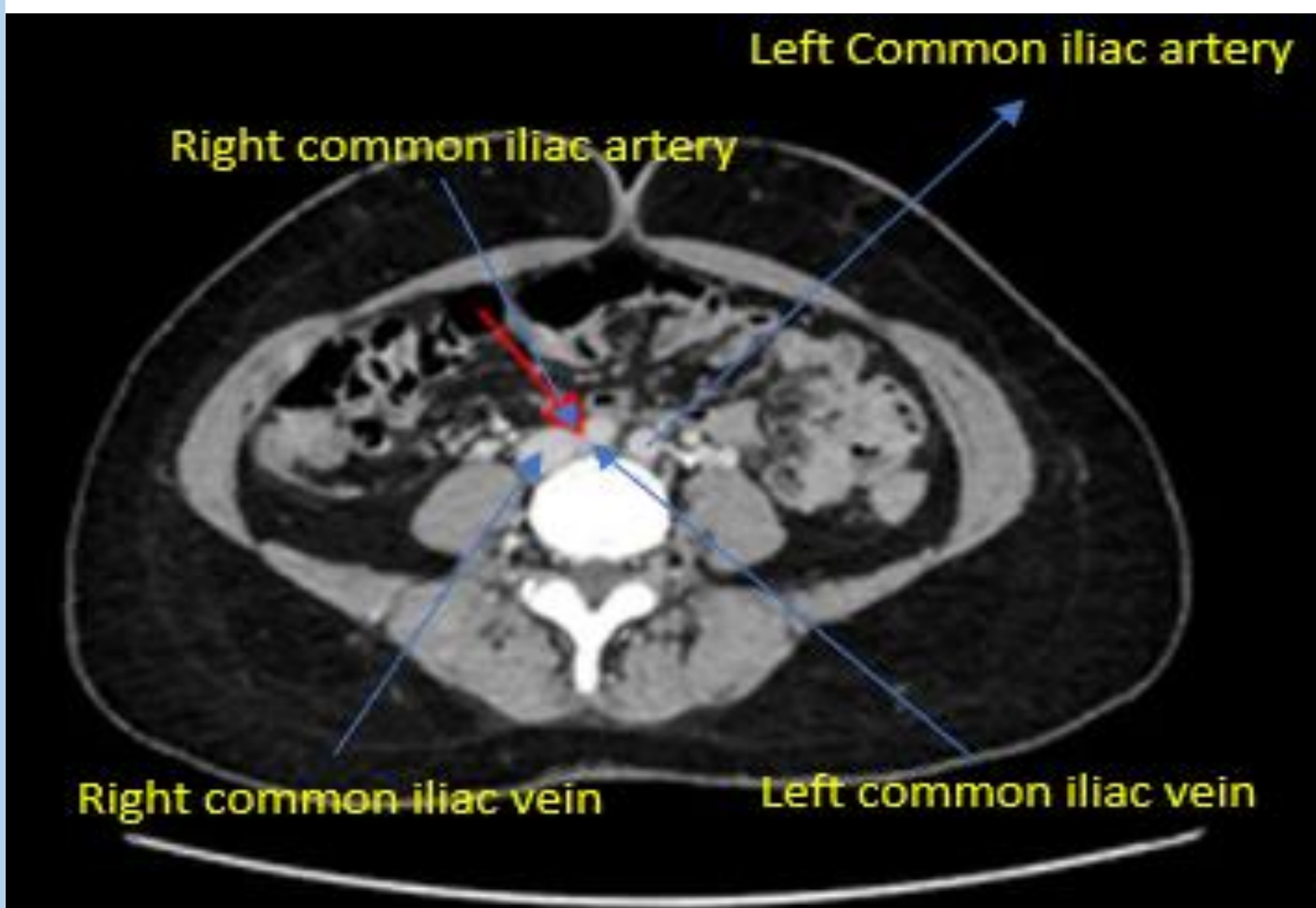


Figure 4: CT scan showing a significant stenosis in the left common iliac vein, leading to the diagnosis of May-Thurner syndrome (Sun and Song, 2021).

## MAY-THURNER SYNDROME- TREATMENT

- Due to the syndrome and the recurrent nature of the DVTs despite systemic anticoagulation treatment, a more aggressive treatment option was needed and the patient underwent a stenting procedure.
- Treatments are aimed at dissolving blood clots and relieving the compression that caused them to form.
- A venous stent was inserted from the left iliac vein to the common femoral vein to prevent further DVTs.

## DISCUSSION- ULTRASOUND MODIFICATION OF TECHNIQUE

### Third Presentation:

- The most recent lower limb Doppler ultrasound was negative for DVT.
- There was a venous stent in situ from the iliac vein to the CFV. Technique had to be modified as due to the presence of the stent, compression could not be achieved, however augmentation and colour Doppler confirmed there was no DVT and there was flow within the stent.
- Compression of the veins in the 'gold standard' technique in excluding a DVT (Kainz et al., 2021) so technique had to be modified in this case.

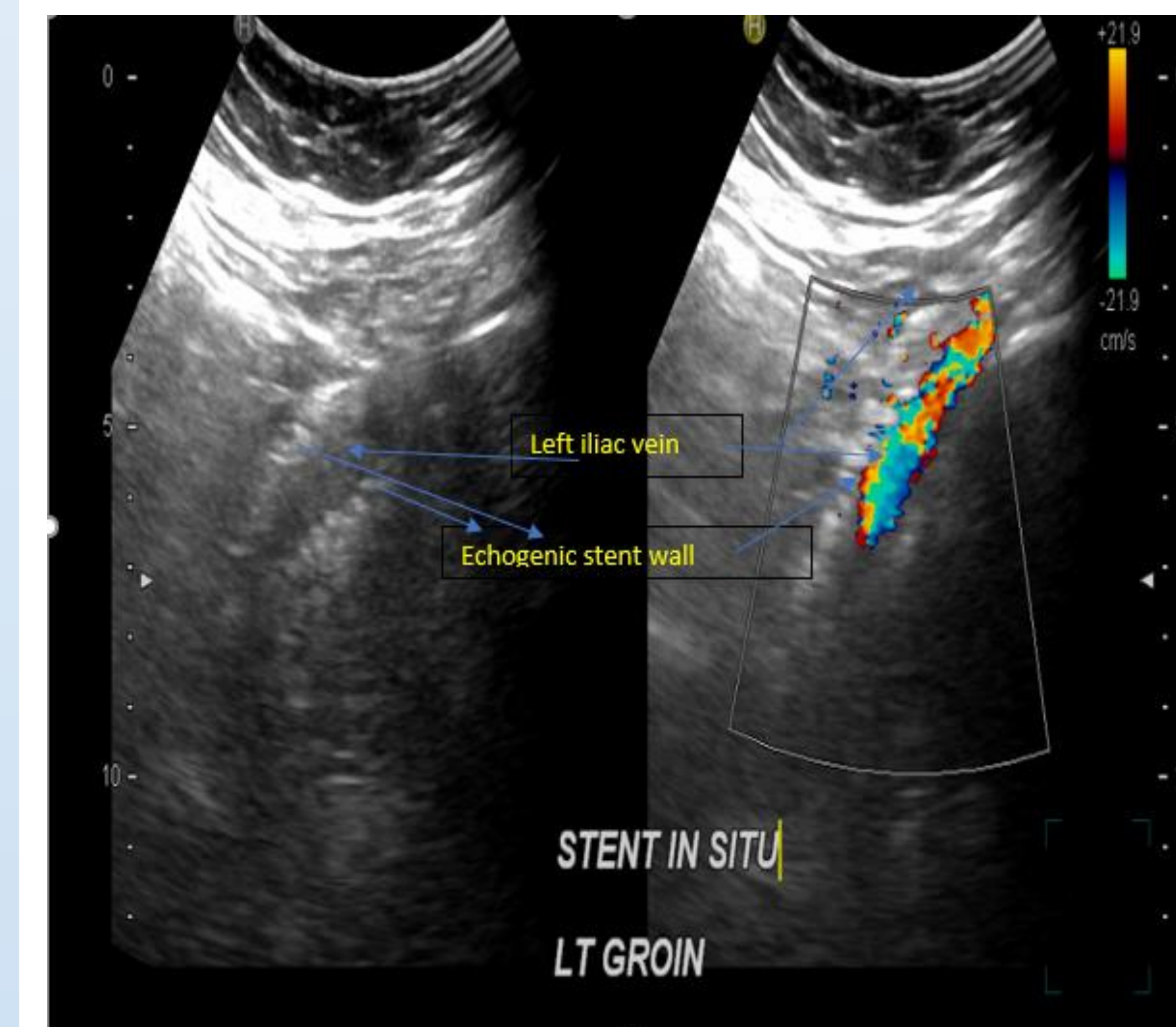


Figure 5: Stent seen in situ in the left iliac vein. Colour Doppler shows flow within the stent.

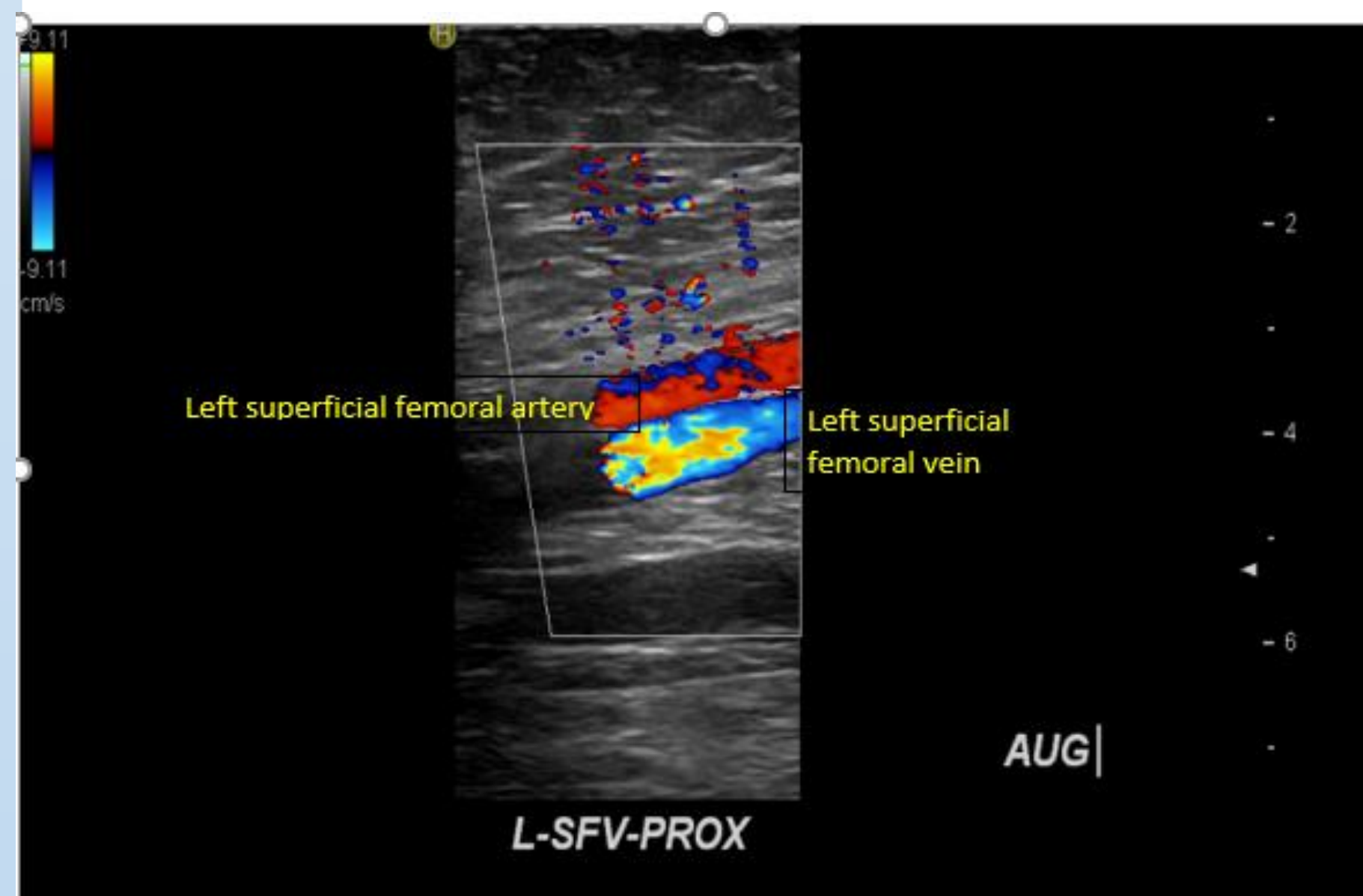


Figure 6: Augmentation shows wall-to-wall filling in the vessels

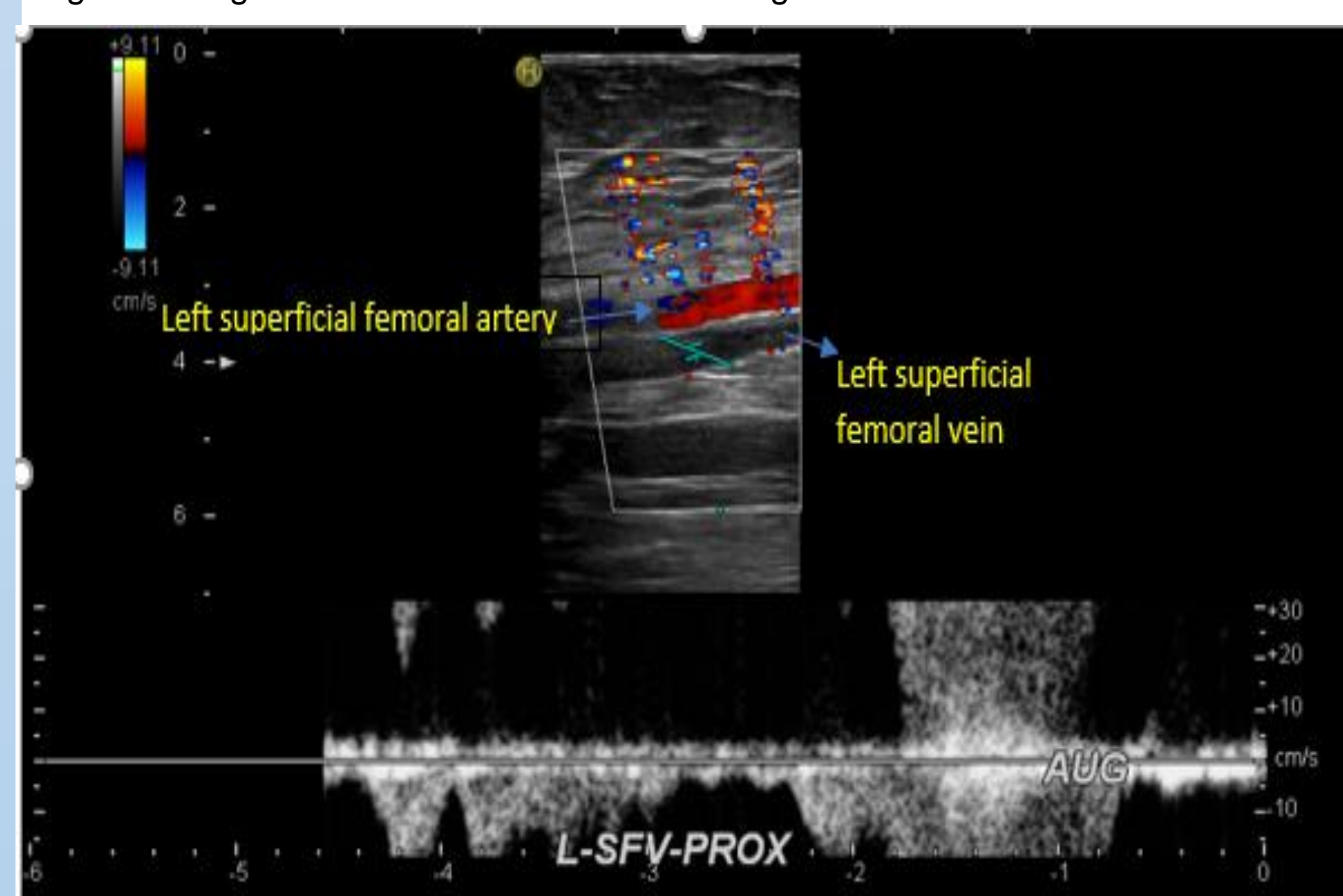


Figure 7: Augmentation shows rise in venous pressure in the left superficial femoral vein.

- Ultrasound technique had to be modified as compression was not possible due to the presence of the venous stent. Augmentation with colour Doppler and spectral trace Doppler proved there was no DVT present.

## CONCLUSION

This poster discussed an educational case of a recurrent DVT in the context of May-Thurner syndrome. Sonographers need to be aware of patients with recurring DVTs may have a compression syndrome such as May-Thurner syndrome. Sonographic technique may also need to be adapted when venous stents are in situ.

## REFERENCES

Knutninen, M.-G., Naidu, S., Oklu, R., Kriegshauser, S., Eversman, W., Rotellini, L., & Thorpe, P. E. (2017). 'May-Thurner: Diagnosis and endovascular management'. *Cardiovascular Diagnosis and Therapy*, 7(3S). Available at: doi:10.21037/cdt.2017.10.14 (Accessed 20 July 2023).

Li, L., Zhen, J., Huang, L., Zhou, J., Yao, L., Xu, L., Zhang, W., Zhang, G., Chen, Q., Cheng, B., Gong, S., Cai, G., Jiang, R., & Yan, J. (2022). 'The risk factors for deep venous thrombosis in critically ill older adult patients: A subgroup analysis of a prospective, multicenter, observational study'. *BMC Geriatrics*, 22(1). Available at: https://doi.org/10.1186/s12877-022-03599-y (Accessed 30 July 2023).

Modi, S., Deisler, R., Gozel, K., Reicks, P., Irwin, E., Brunsvold, M., Banton, K., & Beilman, G. J. (2016). 'Wells criteria for DVT is a reliable clinical tool to assess the risk of deep venous thrombosis in trauma patients'. *World Journal of Emergency Surgery*, 11(1). Available at: https://doi.org/10.1186/s13017-016-0078-1 (Accessed 30 July 2023).

Sun, Y., & Song, S. (2021). 'Nonnegligible causes of symptoms of acute lower extremities—3 cases of May-Thurner syndrome with deep vein thrombosis'. *Thrombosis Journal*, 19(1). Available at: https://doi.org/10.1186/s12959-021-00278-7 (Accessed 20 July 2023).