

INTRODUCTION

Varicocele thrombosis is an exceptionally rare cause of acute scrotal pain. A varicocele is described as an irregularly dilated and painful pampiniform venous plexus within the spermatic cord. The case presented is focused on the role of ultrasound in the detection of varicocele thrombosis. Ultrasound is considered the first line modality in the evaluation of varicoceles and thrombosis. Colour doppler imaging plays a vital role in identifying venous abnormalities like varicoceles and thrombosed elements. Ultrasound is frequently performed alongside physical examinations in the investigation of suspected varicoceles (Lundy and Sabanegh, 2018). Equally, ultrasound is the preferred imaging technique for the assessment of varicocele thrombosis (Nandy *et al.*, 2021) and is deemed the superior modality as it is readily available, highly sensitive, non-ionizing and cost-effective.

PATIENT BACKGROUND

Two young male patients, a 39-year-old and a 24-year-old were referred to the ultrasound department by their GP. Both patients were complaining of intermittent pain and swelling in the left testicle for two weeks. On clinical examination of both patients, they experienced mild tenderness, a heavy dull feeling of the testicle and appeared diffusely enlarged. There was no history of trauma or previous medical history. A testicular ultrasound was requested to examine the cause of the swelling and assess for a varicocele or orchitis. The most common reports of spontaneous varicocele thrombosis were due to trauma or postoperatively (Nandy *et al.*, 2021) which in these clinical scenarios was not the case. This rare pathology can be often misdiagnosed on clinical examination due to the non-specific presentation and comparable similarities to other inguinal conditions.

RELEVANT ANATOMY

Varicoceles are mostly present on the left side. This occurs as the left spermatic vein drains into the left renal vein at a right angle as opposed to the right which flows directly into the inferior vena cava (Wadhwa *et al.*, 2021). This results in increased hydrostatic pressure in the left spermatic vein subsequently causing decreased blood flow, leading to a higher prevalence of left-sided varicoceles (Nandy *et al.*, 2021; Wadhwa *et al.*, 2021).

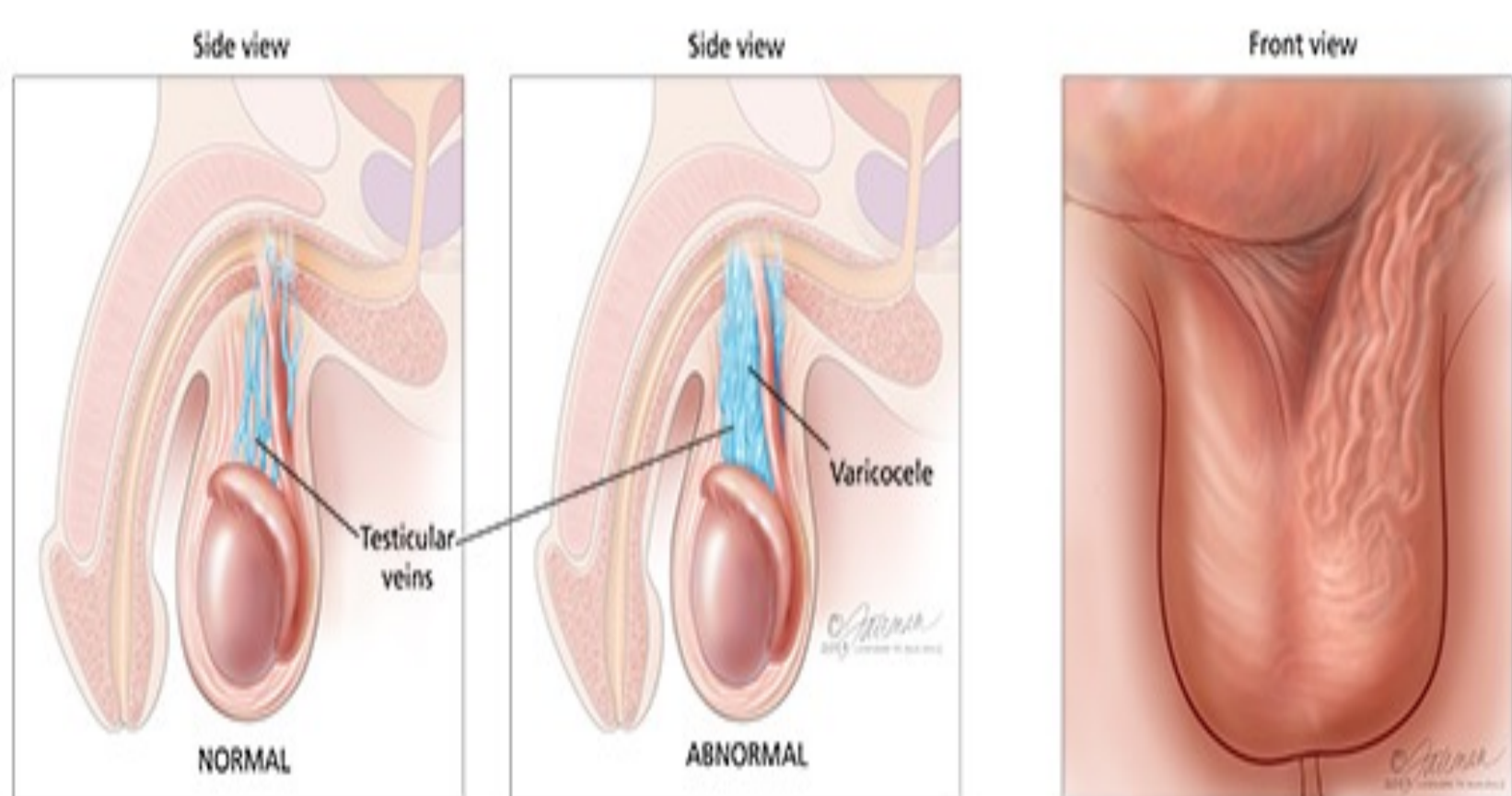


Figure 1. Normal Testicular Anatomy and a Testicular Varicocele (American Urology Association, 2022).

ULTRASOUND EXAMINATION

A testicular ultrasound scan was performed using a high-frequency (12MHz) linear transducer along with a Canon Aplio-i700 ultrasound machine. A chaperone was used during the examination, as per department protocol. The patients were positioned supine on the table with their legs placed together, with the penis positioned supra-pubically and a support was placed beneath the scrotum to achieve an optimal scanning position. Both testes were assessed in longitudinal and transverse planes with B-mode, colour doppler and calliper measurements. The patient was asked to identify the region of pain and swelling and this region was interrogated by sonopalpation. In both cases, the sonographic appearances demonstrated a moderately sized varicocele detected on the left side combined with a short segment of thrombosed vein, suggestive of a thrombosed varicocele. Colour doppler confirmed the absence of flow in a small portion of the varicocele.

ULTRASOUND EXAMINATION

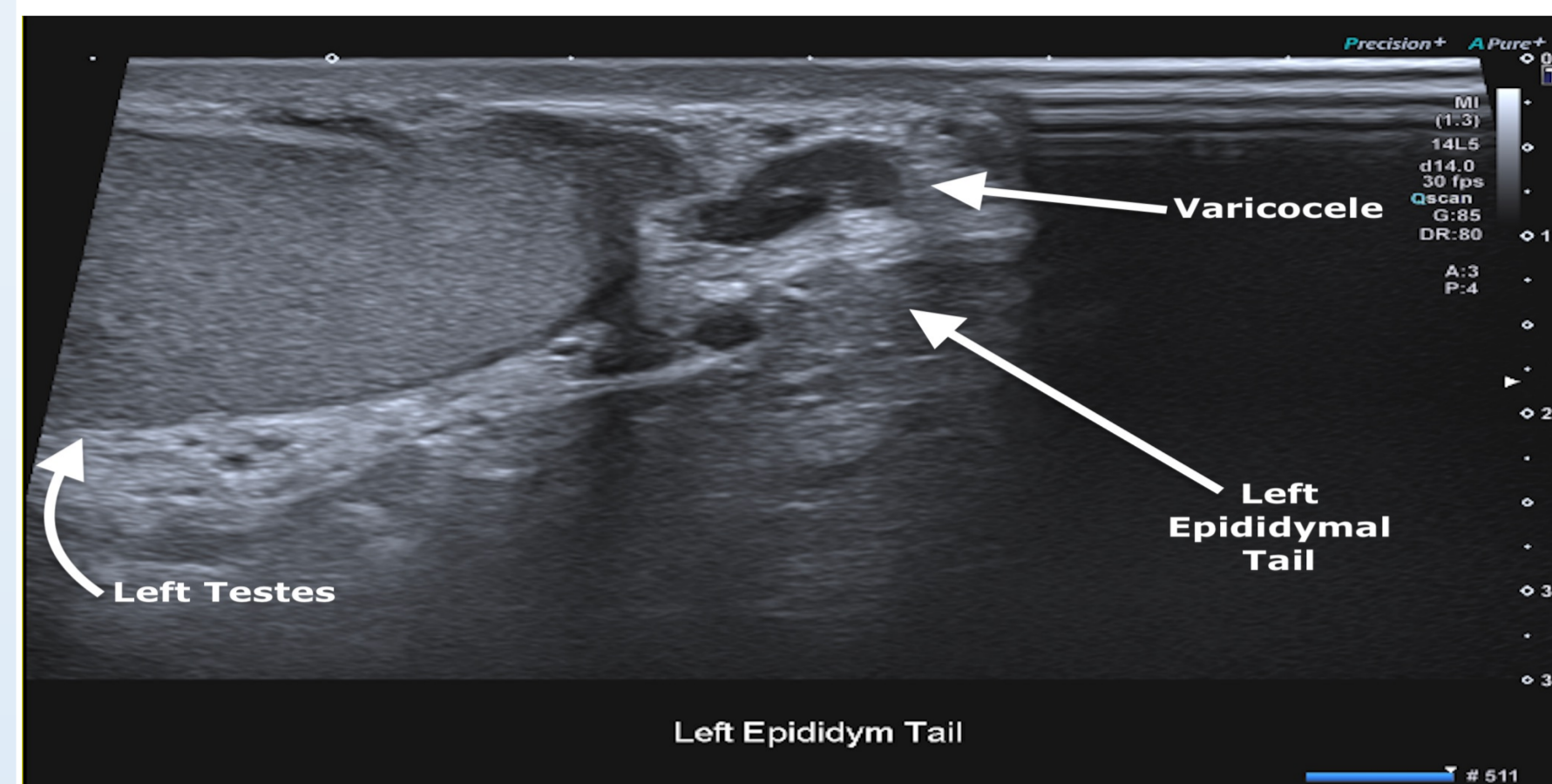


Figure 2: B mode, longitudinal view of the left testes and epididymal tail, illustrating hypoechoic areas, suggestive of a varicocele (Hospital X, 2023).

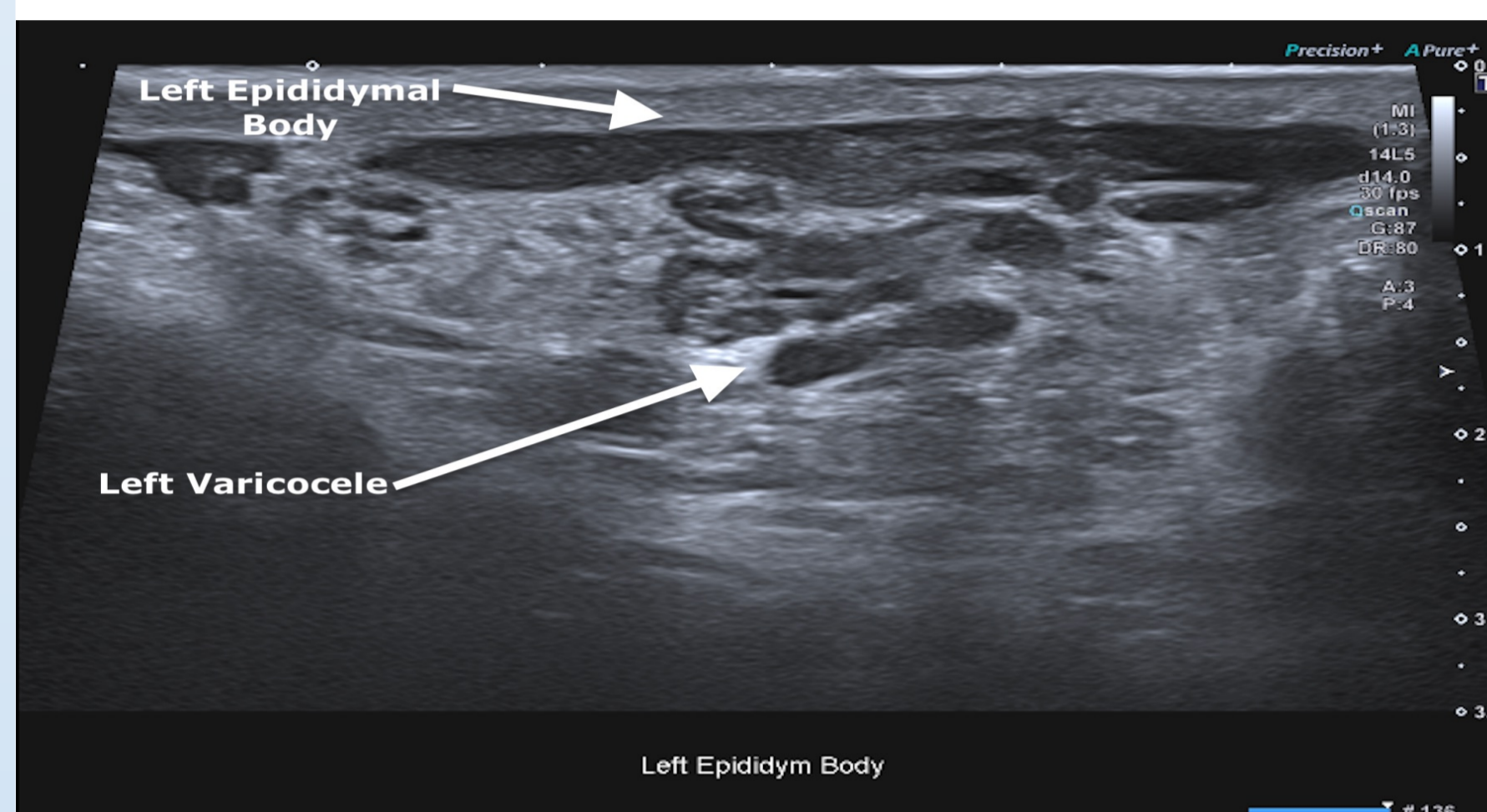


Figure 3. B mode, longitudinal view of the left epididymal body, demonstrating tubular, hypoechoic areas inferior to the epididymal body, a varicocele (Hospital X, 2023).

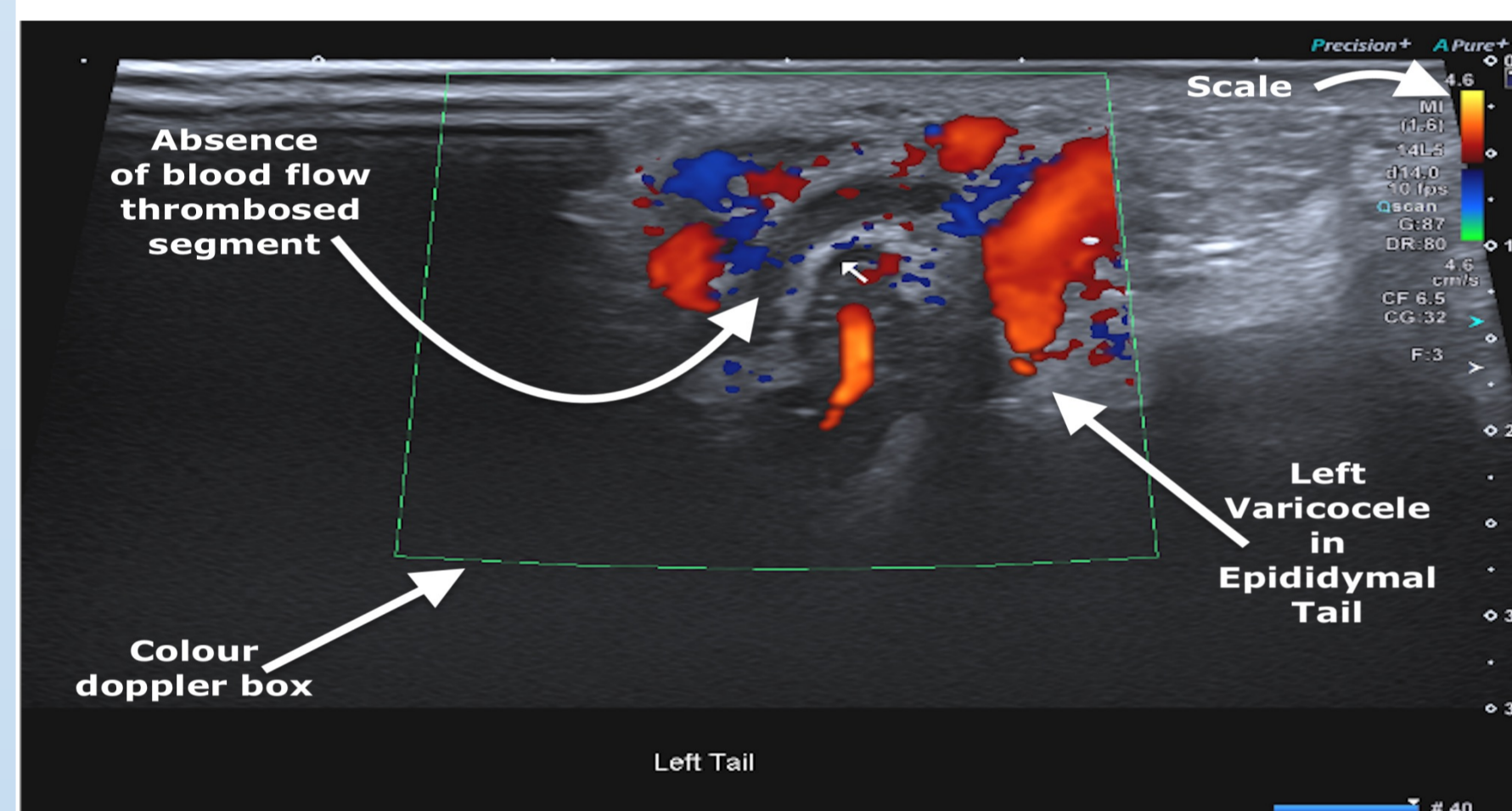


Figure 4. Colour doppler imaging of the left epididymal tail with a linear hypoechoic structure, appearing avascular during Valsalva (Hospital X, 2023).

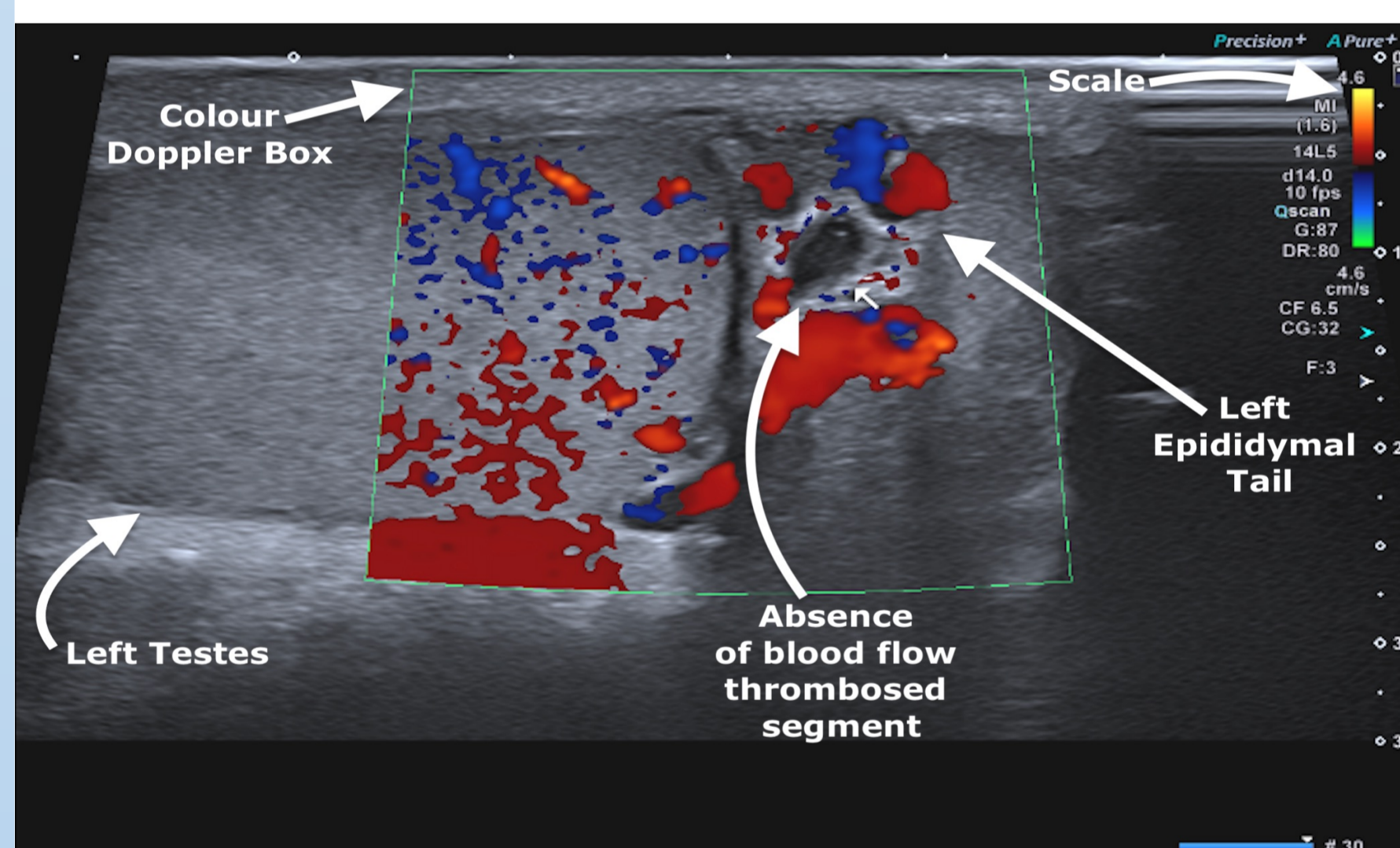


Figure 5. Colour doppler of the left testes and epididymal tail, highlighting normal vascularity in the left testes and a small hypoechoic tubular structure with no vascularity, located within the varicocele (Hospital X, 2023).

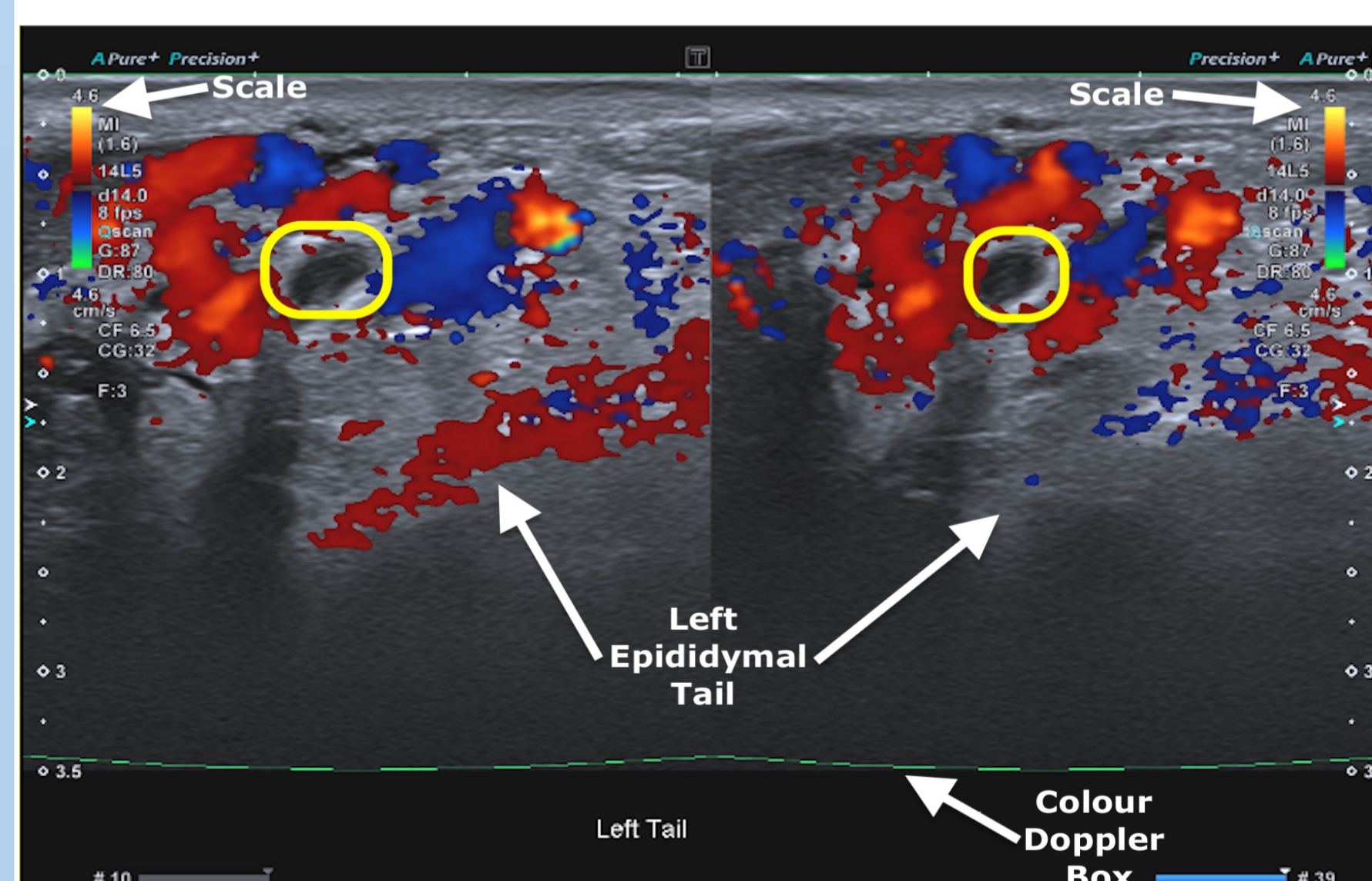


Figure 6. Colour doppler of the left epididymal tail, demonstrating blood flow within the varicocele, combined with a small avascular segment imaged during Valsalva (Hospital X, 2023).

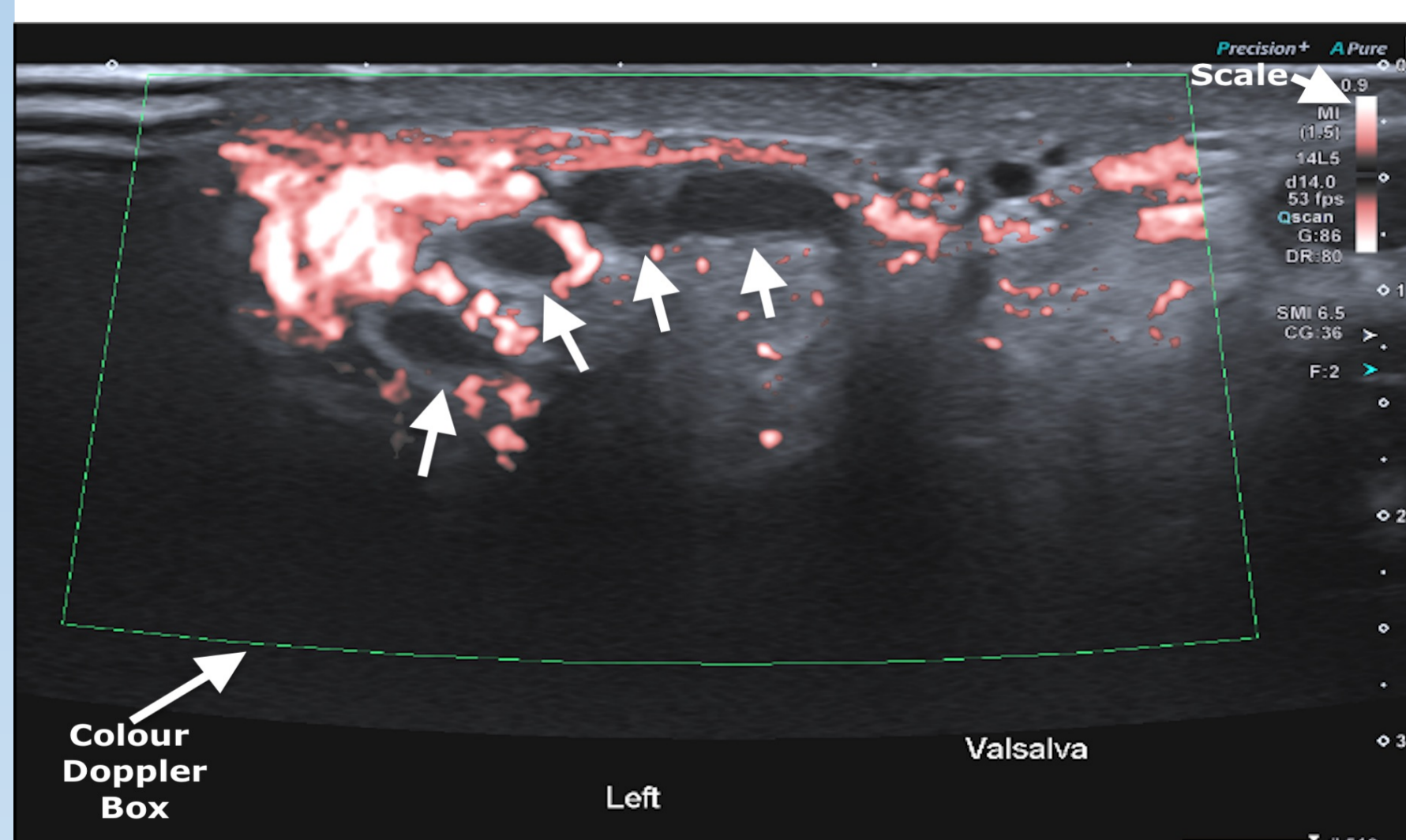


Figure 7. Superb microvascular imaging, white arrows illustrate multiple areas within the varicocele lacking hypervascularity, suggestive of varicocele thrombosis (Hospital X, 2023).

DIAGNOSTICS & TREATMENT

Ultrasound imaging and physical examination confirmed the diagnosis of left varicocele thrombosis in both patients. Subsequently, both males were treated successfully with conservative treatment. An anticoagulant was only considered if the patient's symptoms reoccurred after a two-week period. Currently, no universally recognised treatment protocol has been implemented due to its rarity however some studies report the majority of cases with reported thrombosed varicoceles responded well to conservative treatment (Nandy *et al.*, 2021).

Surgical intervention is usually only considered in patients not improving with conservative management after a two week period (Nandy *et al.*, 2021). Carrying out surgery also increases the likelihood of potentially migrating the thrombus (Nandy *et al.*, 2021). Although varicocelectomy is recommended in symptomatic patients with varicocele thrombosis, not responding to conservative treatment, as it promotes immediate pain relief (Raghavendran *et al.*, 2018). Varicocelectomy and percutaneous embolization of the spermatic vein are deemed viable treatment options for varicoceles associated with persistent pain and risk of infertility (Lundy and Sabanegh, 2018). In 90% of service users that receive a varicocelectomy, they report partial improvement or resolved symptoms, increased fertility rates and minimal complications (Lundy and Sabanegh, 2018). Similarly, percutaneous embolization is a safe, more cost-effective, non-surgical treatment option with minimal invasion for the patient that promotes fertility and diminishes pain (Wadhwa *et al.*, 2021).

DISCUSSION

A diagnosis of varicocele thrombosis was confirmed by physical examination and ultrasound imaging. Physical examination is deemed paramount in the initial investigation of varicoceles and informs future patient pathways (Lundy and Sabanegh, 2018). Ultrasonography is pivotal in patients with difficult clinical presentations and when the physical examination is limited (Lundy and Sabanegh, 2018). Sonographic imaging is noted as the gold-standard imaging technique in the investigation of varicoceles (Freeman *et al.*, 2020). Equally, varicocele thrombosis is best established through b-mode ultrasonography and colour doppler imaging (Nandy *et al.*, 2021). The use of colour doppler ultrasound is essential in examining varicoceles as it creates optimal spatial resolution and recognizes venous obstruction (Lundy and Sabanegh, 2018). Continued research is recommended to better understand the occurrence of varicocele thrombosis, the underlying processes and potential long-term health effects. There is a need to establish a standardised treatment protocol for varicocele thrombosis due to the potential effect on the younger male population.

CONCLUSION

Varicocele thrombosis is an extremely rare source of acute scrotal pain. Ultrasound played a vital role in the detection of a left-sided varicocele with thrombosis in two young males. High-frequency ultrasound is deemed a quick and effective modality for assessing scrotal anatomy and identifying pathology. B-mode and colour doppler ultrasound are highly sensitive and show optimal specificity in evaluating testicular varicoceles and associated thrombus. Conservative treatment is typically recommended however anticoagulants, surgical intervention and embolization are therapeutics indicated in symptomatic patients with higher risks of infertility and venous thrombosis.

REFERENCES

All images were courtesy of the PACS department of Wexford General Hospital.
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