

Preventing deaths in Ambulatory Care from Isolated Pelvic Vein Deep Vein Thrombosis: Mortality and Morbidity Meetings have a key role

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Key Learning Points

- Consider isolated iliac vein thrombosis in patients whose leg swollen to the groin and a normal Doppler Ultrasound if no other explanation can be identified by clinical assessment
- MR or CT venography are the investigation modalities of choice for diagnosing isolated pelvic vein thrombosis
- Morbidity and Mortality meetings to review practice are of key importance on the AMU

Abstract

Isolated Pelvic vein Deep Venous Thrombosis (DVT) is a relatively rare phenomenon, but is usually not identified by conventional lower limb duplex Ultrasound scanning. We present two cases of isolated iliac vein thrombosis; the first resulting in the patient's death from Pulmonary Embolism (PE) after normal lower limb duplex scan. The second case was identified and successfully treated after introduction of a revised investigation algorithm following the first case. The literature supports the use of magnetic resonance imaging, CT venography, or ascending venography, to diagnose this condition.

Introduction

Venous thromboembolic disease is a significant cause of morbidity and mortality throughout the world. The majority of lower limb DVT start in the calf veins and progress proximally; DVT isolated to the pelvic veins is usually considered to be an unusual phenomenon. Conventional imaging to exclude DVTs usually involves Duplex Doppler Ultrasound, an effective and sensitive tool in diagnosing DVT distal to the saphenofemoral junction; however this technique is less reliable when imaging the pelvic veins.

Case History 1

A 45 year old woman was referred to the DVT service from surgical outpatients complaining of a swollen right leg over the previous 4 days. She had undergone AP-resection for a Duke's C1 rectal carcinoma, with clear resection margins, 2 weeks earlier. Prophylactic dose Low Molecular Weight Heparin (LMWH) had been administered during her hospital stay and she had been mobile since discharge. She had not described any significant breathlessness since her surgery and felt systemically well. Examination confirmed the presence of right leg swelling which extended to the groin level, without significant erythema. She was afebrile.

Duplex Ultrasound was performed and showed no evidence of DVT below or above the knee level to the sapheno-femoral junction. 2 days later she collapsed and died. A post-mortem examination revealed a 'saddle' pulmonary embolus and isolated

thrombus in the common iliac vein on the right. No thrombus was identified in the femoral or calf veins.

Following this case an urgent review of our practice was undertaken, with discussions at both medical and surgical mortality and morbidity meetings. A literature review was conducted which led to a change in our practice as outlined below.

Literature Review

Incidence of Isolated Pelvic DVT

The precise incidence of isolated pelvic DVT is difficult to establish, due to the challenging nature of the diagnosis. A study of 167 patients with a high clinical suspicion of proximal DVT after negative duplex scan revealed that 20.4% had isolated pelvic thrombosis using MR venography.¹ 6% of 118 patients with DVT and confirmed PE were found to have isolated pelvic DVT by MR venography, all of which were missed by duplex scanning²

Predisposing factors

Case studies of isolated pelvic vein DVTs suggest that pelvic pathology is a common predisposition. Such pathologies include pelvic inflammation in the context of inflammatory bowel disease,³ pelvic malignancy, pelvic trauma⁴ and pelvic surgery, particularly caesarian section.⁵ There is also a case series of patients with no other risk factor other than the Oral Contraceptive Pill.⁶ Another rare, but well described cause, is the Iliac Vein Compression Syndrome (IVCS), otherwise known as May Thurner syndrome. This occurs as the result of compression of the left common iliac vein between the right common iliac artery and the overlying vertebra. It commonly presents as a left lower limb DVT and this may be isolated to the pelvic veins.

Diagnostic Tests

Conventional Doppler Ultrasound performs relatively badly in diagnosing Pelvic vein DVTs when compared to other techniques such as MR and CT venography.^{1,8} The 'gold standard' technique is traditionally Ascending Venography. But this invasive test is rarely used now and can be difficult to interpret in the pelvic veins.⁹ Some authors even feel that MR and CT

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venography should replace it as the reference standard. One study, found more pelvic vein DVTs with MR than with ascending venography, using direct puncture venography to clarify contentious cases.¹⁰ Other studies confirm that MR venography is at least as sensitive as ascending venography.^{1,11} CT venography has also been shown to be equally effective,¹² although the radiation dose involved is a relative disadvantage compared to MR. Consequently shorter scanning times than MR are also necessary, necessitating more radiologist supervision to monitor image acquisition.¹³

Changes in Practice

Following review of the literature a new algorithm was devised to ensure that isolated iliac vein thrombosis was not missed in future. These are summarized in Figure 1.

Case Study 2

Two months after changing the investigation pathway a 66 year old woman was referred with a swollen left leg. She was on hormone replacement therapy, but had no other risk factors for venous thromboembolism. Her leg was swollen to the groin level. Following negative duplex scan she was reviewed by the Acute Medicine consultant. In the absence of an alternative explanation for her leg swelling, she was prescribed low molecular weight heparin and a pelvic CT Venogram was subsequently performed. This demonstrated

- All patients with unilateral leg swelling extending to groin level to be reviewed by acute medicine consultant or SpR prior to discharge if duplex scan normal.
- Consider isolated iliac vein thrombosis if:
 - Patient has one or more of the following risk factors – recent pelvic surgery / trauma; pelvic inflammation, pelvic radiotherapy
 - No other clinical explanation for leg swelling (e.g. cellulitis, chronic lymphoedema, post operative dependent oedema)
- If isolated iliac vein thrombosis is considered likely, commence treatment with daily enoxaparin 1.5mg/kg until imaging is undertaken
- Arrange pelvic CT venogram or MR venogram within 48 hours

Figure 1. New management approach for patient with leg swelling to groin level and normal duplex scan.

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