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CASE REPORT

Iliofemoral Deep Vein Thrombosis Secondary to Venous Compression by a Massively Distended Bladder

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ABSTRACT

A case of iliofemoral deep vein thrombosis secondary to venous compression by a massively distended bladder is reported. Ascending venography was valuable in identifying the primary cause of venous obstruction, as well as guiding thrombolysis.

Key Words: *Bladder, Edema, Femoral vein, Prostatic hyperplasia, Thrombolysis, therapeutic, Vein, iliac, Venography, Venous thrombosis*

INTRODUCTION

Abnormal bladder distension due to obstruction is most common in men and generally due to an enlarged or abnormal prostate. Its association with bilateral leg oedema is well-recognised, and considered to be due to direct compression of the external iliac veins by the distended bladder. Rarely, iliac vein compression may lead to unilateral leg oedema. To our knowledge, the association between bladder distension and iliofemoral vein thrombus has not been described in the modern literature. We present a case of unilateral compression of the iliac vein by a distended bladder, resulting in an extensive iliofemoral deep vein thrombosis (DVT) of the left leg. Imaging depiction of this rare association, with serial imaging follow-up during treatment is provided. This case should alert both clinicians and radiologists to this possible association.

CASE REPORT

A 68-year-old male was referred to the emergency department by his family physician for further evaluation of a suspected left iliofemoral DVT. The patient had noted increasing swelling in his left leg over the past 5 days. Apart from a 15 pack-year history of smoking, the patient had no significant contributory factors related to DVT. The only other complaint was a long history of urinary symptoms of dribbling, nocturia and incomplete bladder emptying. This had been investigated in the past with a transrectal ultrasound and biopsy, showing benign hyperplasia with no malignancy. A prostatic serum antigen level was within the normal range. Physical examination demonstrated extensive swelling of the whole of the left leg to the level of the groin, with pitting oedema and slight tenderness consistent with an extensive iliofemoral DVT. Rectal examination revealed a smooth but enlarged prostate. Doppler ultrasound confirmed the presence of an extensive thrombus involving both the superficial and deep femoral veins, extending proximally to involve the common femoral vein and distal external iliac vein. In view of the relatively acute nature of the symptoms and the extensive nature of the thrombus, it was decided to treat the DVT by thrombolysis. A popliteal vein puncture was performed, and contrast venography demonstrated extensive thrombus of the common and superficial femoral vein extending into the external iliac vein, with associated extensive collateral vessel formation (Figure 1). The proximal limit of the thrombus was clearly seen in the mid-portion of the external iliac vein. The external iliac vein immediately proximal to the thrombus appeared markedly attenuated (Figure 2). A Craig-McNamara thrombolysis catheter was then placed within the clot, and thrombolysis was commenced using tissue plasminogen activator infused at a rate of 1.5 mg/hour with administration of heparin 300 IU/hour through the popliteal sheath. The patient returned to the department the following

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Figure 1. Ascending venogram of the left ileofemoral region demonstrating extensive collateralisation of venous flow. Intraluminal iliac thrombus is identified proximally (arrow).

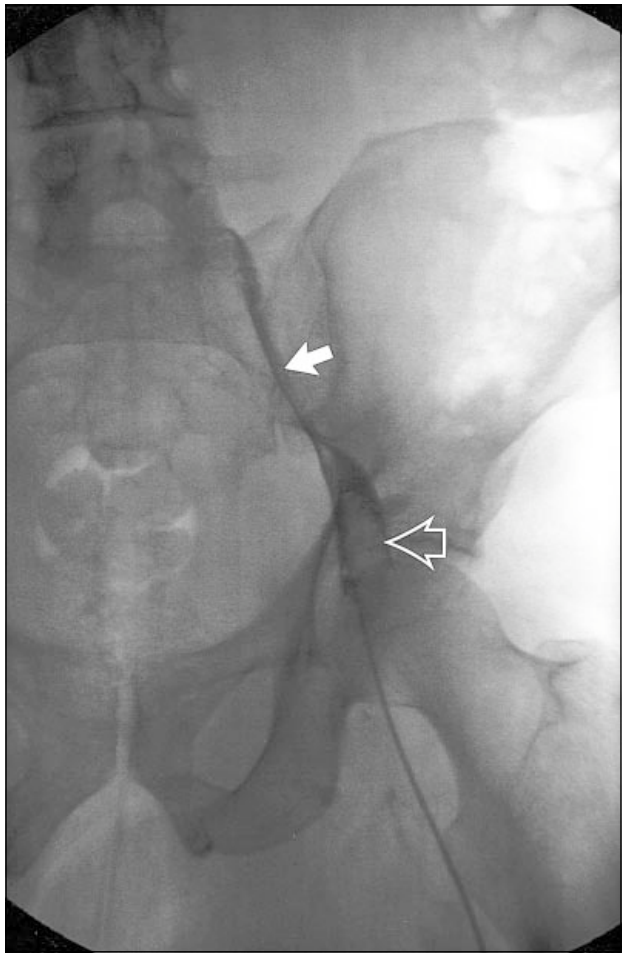

Figure 2. Ascending venogram identifying the specific area of obstruction of the iliac vein. Smooth narrowing of the external iliac vein is present (closed arrow). Thrombus is identified within the external iliac vein immediately distal to the narrowed segment (open arrow).

day for repeat venography, which demonstrated marked improvement. However, persistent stenosis of the external common iliac vein was noted. In addition, the bladder was now fortuitously distended with contrast-opacified urine (from the recent venography), and was seen to be compressing the left iliac vein (Figure 3). Bilateral hydronephrosis was also noted (more pronounced on the left).

A transurethral catheter was placed into the bladder, with the evacuation of at least 3 litres of urine resulting in radiologically-confirmed decompression of the bladder. Subsequent venography showed that left common iliac compression had completely resolved, indicating that the distended bladder was responsible for the stenosis (Figure 4). There was, however, some residual thrombus. The patient was placed on heparin and converted to oral anticoagulants, and followed a normal course of recovery.

Further investigations including CT and extensive urological investigations revealed no other masses or underlying problems apart from an enlarged prostate. A transurethral resection of the prostate was later performed, confirming benign prostatic hyperplasia as the cause of urinary retention.

DISCUSSION

Simple venous obstruction (without associated DVT), secondary to compression of a distended urinary bladder, has been described since 1960.[1] At least 15 additional cases have been reported in the English-language literature, with the vast majority in men.[2] The majority of cases of iliac compression secondary to bladder distension presented with bilateral compression and lower-extremity symptoms.[2,3] Prostatic hyperplasia remains the major contributing factor in 11 of the 16 case reports — however, it is important to acknowledge that the presentation of leg oedema in this condition is

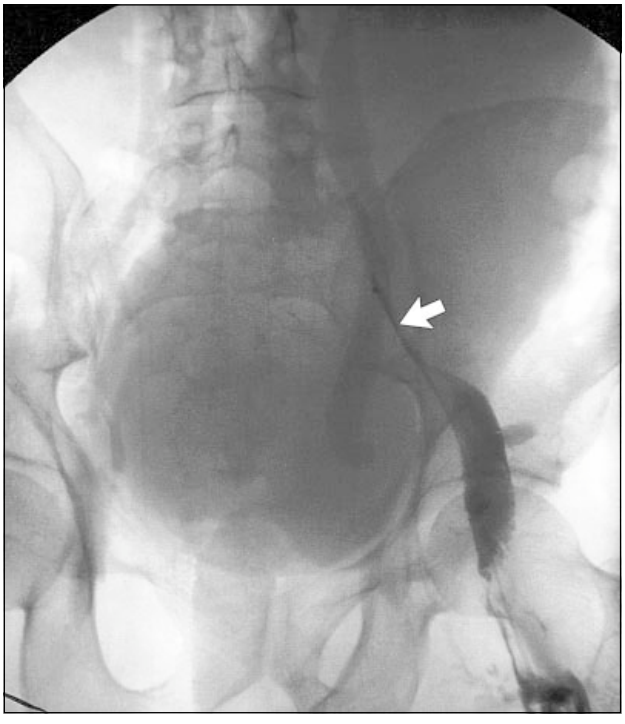

Figure 3. Ascending venogram through a Craig-McNamara catheter demonstrating a markedly distended bladder, deviating to the left, causing compression of the external iliac vein (arrow). Opacification of the bladder is due to collection of contrast material in the urine. There is also marked secondary dilatation of the left ureter.

rare. In all cases, successful decompression via catheter drainage resulted in prompt resolution of symptoms, with no resultant thrombus identified. Some of these authors have suggested that decompression of the bladder in such cases would result in prompt resolution of symptoms.[4] However, the present case suggests that further evaluation may be required to exclude associated thrombus.

There are many recognised causes of DVT, which can all be attributed to Virchow's classic triad of stasis, hypercoagulable state, and local vessel inflammation (Table 1). While bladder compression has been described as a cause of leg swelling, it has not previously been described as a cause of thrombus. Despite the well-documented literature addressing the other causes of leg swelling mimicking DVT, including entities such as compression of the inferior vena cava, gravid uterus, inflammation, and congenital anomalies such as the iliac compression syndrome,[5,6] only 2 case reports in the current literature identify bladder distension as a case of unilateral leg swelling.[2,3]

Clinical evaluation of DVT usually requires imaging correlation, both to confirm the presence of thrombus,

Figure 4. Ascending venogram showing resolution of proximal narrowing of the external common iliac vein following evacuation of the bladder. There is still slight residual thrombus.

and to document its extent. Ascending venogram was the main imaging modality in the past, due to its high accuracy in detecting DVT. Unfortunately, due to its invasive nature (requiring the use of intravenous contrast material) and the use of ionising radiation, it has fallen out of favour as a primary diagnostic tool. A further limitation is the potential difficulty in distinguishing between intra- and extraluminal obstruction in the relatively low-pressure environment of the venous system.[7] However, venography is an

Table 1. Causes of deep vein thrombosis.

Local vessel inflammation
Varicose veins
Graft thrombosis
Thrombophlebitis
Scar
Trauma
Adjacent inflammation
Stasis
Bed rest
Restriction of motion
Congestive heart failure
Compression
Shock
Hypercoagulation
Trauma
May-Thurner syndrome (iliac vein compression between the common iliac artery and vertebral bodies)
Hyperviscosity
Cancer
Hyperoestrogenic states
Congenital deficiency of thrombolytic factors (antithrombin II, proteins C and S)
Dehydration

essential part of any interventional procedure aimed at direct local thrombolysis. In cases such as the present, venography not only aided in guiding thrombolysis, but was also invaluable in producing opacification of the bladder, and thereby identifying the primary cause of venous obstruction.

Duplex ultrasound has become the imaging modality of choice in the diagnosis of DVT. The combined use of colour Doppler and real time imaging of the venous system by ultrasound allow for rapid identification of intraluminal thrombi, with a sensitivity of 87 to 96% and specificity of 89 to 100%.[8,9,10] In cases where iliac compression simulates thrombus, the results are much less reliable, as the iliac veins are more difficult to visualise than the more superficial femoral veins. Some authors have even reported negative results in such cases.[2,11]

Plethysmography may detect iliac, femoral, and popliteal thrombi though the measurement of venous flow during the inspiratory and expiratory cycles, but is unable to identify clots that are partially occluded, and may provide a false-negative result if rich collateral veins negate the area of stenosis/obstruction.[11]

CONCLUSION

We have described a previously unreported association between bladder distension and subsequent thrombosis of the iliofemoral venous system. Previous case reports have described simple bladder decompression as the treatment of choice in relieving leg oedema from venous compression; however, the presence of extensive thrombus must remain a consideration, as demonstrated in this case. For this reason, the authors recommend that such cases be treated by a combination of simple bladder decompression, appropriate follow-up, and specific therapy directed at the associated thrombus.

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