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Case Report

# Isolated renal vein and inferior vena cava thrombus following blunt trauma abdomen. A rare case scenario☆

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ABSTRACT

*Objective:* Renal vein thrombosis in adults occurs as a result of various etiologies such as nephrotic syndrome, renal cell cancer, hypercoagulable state and trauma. Renovascular injury happens in 3% to 4% of patients with blunt abdominal trauma and usually occurs in association with significant injury to the abdominal viscera or skeleton.

*Method:* A 40-year-old female suffered from blunt abdominal trauma following a road traffic accident while she was travelling as a pillion rider on a two-wheeler vehicle.

*Result:* The patient was diagnosed with left renal vein and inferior vena cava thrombus without any associated renal parenchymal or injuries to other organs. She was managed conservatively with anticoagulants and regular monitoring. Follow up imaging after 3 months showed complete resolution of thrombus.

*Conclusion:* Traumatic renal vein or inferior vena cava injury usually occurs in combination with renal arterial or parenchymal injury. Isolated major venous injury is rare.

## Introduction

Renal vein thrombosis is caused by nephrotic syndrome, retroperitoneal tumours with vein compression, hypercoagulable state, trauma and malignancy. Traumatic venous thrombosis is commonly associated with renal artery and major parenchymal injury. Isolated renal vein thrombosis following trauma is rare. Contrast enhanced computed tomography imaging confirms the diagnosis. If patient is stable with no risk of thromboembolic episodes, conservative approach is preferred and anticoagulants initiated and closely monitored. Herein, we present a case of road traffic accident with isolated renal vein and inferior vena cava (IVC) thrombosis. This is probably the first case in English literature reporting IVC and renal vein thrombus following blunt abdominal trauma.

## Case presentation

A 40-year-old female was referred to our center with the history of a roadside accident while she was travelling as a pillion rider on a two-wheeler vehicle hit by a car from behind. The rider fell sideways and sustained clean cut wounds over the forearm and left knee. The pillion rider was accelerated in the front and hit by the two-wheeler handle in the abdomen. She complained of right upper abdominal pain and few minor abrasions over the right lower limb. There was no complaint of vomiting, seizures, back pain or haematuria. Her past medical history was insignificant. On examination, patient was alert and conscious; vitals were stable, physical and systemic examinations were normal. Routine work including hemogram, renal function test and serum electrolytes were normal.

☆ Informed consent: Patient's informed consent was obtained regarding the use of personal data and images for the preparation of this manuscript.

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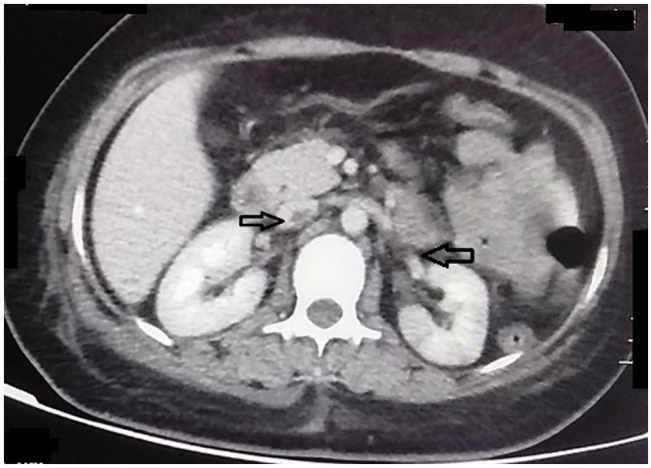

**Fig. 1.** CECT abdomen axial image depicting partial inferior vena cava thrombus and left renal vein thrombus. (Black transparent arrow).

Abdominal ultrasound showed mild free fluid in pelvis. X ray chest and right lower limb were grossly normal. Contrast enhanced CT (Computed tomography) abdomen revealed partial thrombus of left renal vein and infra hepatic inferior vena cava thrombus (Fig. 1). There were no collateral vessels in the adjacent surrounding area suggesting it as an acute event. The renal artery was normal with no evidence of renal parenchymal injury. Rest of the solid organs were grossly normal. In view of isolated venous involvement, the conservative approach was trailed. Patient was advised strict bed rest and vitals were monitored at frequent intervals. Baseline prothrombin time (PT) and international normalized ratio (INR) were done and the injection Enoxaparin 0.75 mg/kg twice a day started after consultation with haematology expert. PT and INR were monitored daily and 2 mg warfarin tablet started on day 4, overlapping with enoxaparin keeping therapeutic range of INR between 2 and 3. Patient was discharged on day 8 and advised to follow up at regular intervals with INR. A repeat contrast CT after 3 months showed complete resolution of thrombus (Figs. 2, 3). Haematology review was taken and anticoagulants were continued for another 3 months and tapered gradually. Currently, patient is asymptomatic, 8 months follow up and planned for colour Doppler imaging of renal vessels.

## Discussion

Renal vein thrombosis in adults occurs as a result of various aetiologies such as nephrotic syndrome, tumour thrombus and trauma [1]. Renovascular injury is rare with blunt abdominal trauma. It usually has concomitant major organ or other skeletal injuries. Traumatic renal vein thrombosis is commonly associated with renal arterial or parenchymal injury [2]. Previously only 2 cases with isolated renal vein thrombosis were reported in English medical literature to the best of our knowledge. In both of these cases, patients presented with haematuria and the thrombus was limited to renal vein [3,4].

The clinical profile of patients with renal vein thrombosis due to any cause may vary from being asymptomatic to symptoms like nausea or vomiting or specific symptoms such as haematuria or loin pain. One of the disastrous complications is pulmonary embolism which may be the first presenting sign of renal vein thrombosis [5]. Contrast enhanced CT is non-invasive, performed quickly and has high diagnostic accuracy for diagnosis of major venous thrombosis [6,7]. Malignant thrombosis associated with renal cell cancer has enhancement and features of wall infiltration. Bland thrombus seen following trauma appears as hypodense filling defect in lumen of

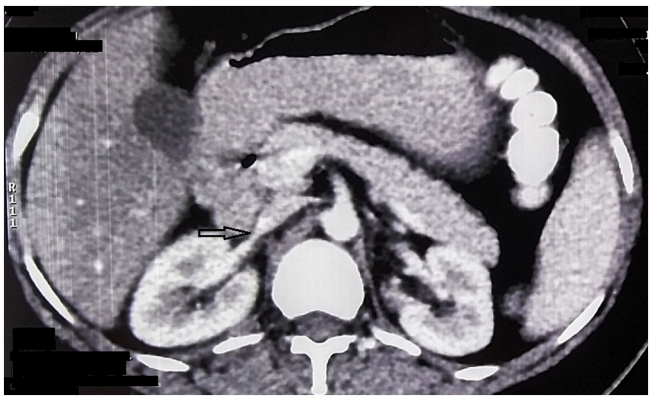

**Fig. 2.** Follow up CECT abdomen axial image at 3 months showing complete resolution of thrombus in inferior vena cava. (Black transparent arrow).

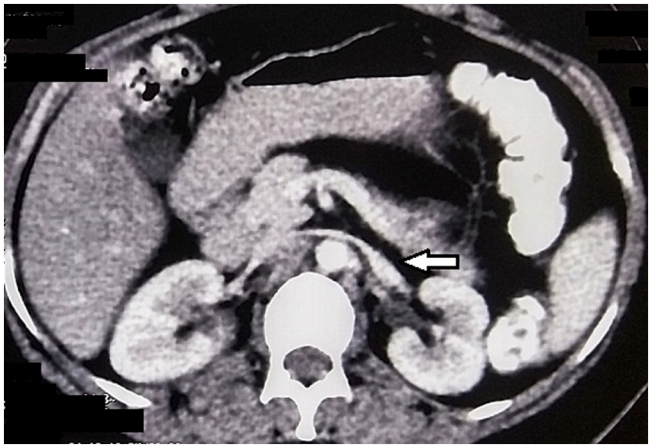

**Fig. 3.** Follow up CECT abdomen axial image at 3 months showing complete resolution of thrombus in left renal vein. (White solid arrow).

the veins. Treatment aims towards salvage of renal function and prevention of complications. In stable patients, conservative therapy is preferred. Regular monitoring of vitals and oral anticoagulant therapy for dissolution of thrombus is favoured option. Anticoagulation is started early to prevent propagation of thrombus and potential serious thromboembolism. Heparin is the initial anticoagulant of choice. Recently, low molecular weight heparin such as enoxaparin has been used widely as it does not bind to plasma proteins and has improved efficacy over unfractionated heparin in preventing thromboembolism. Also, unfractionated heparin has higher incidence of side effects in patients with renal and liver failure [8]. Oral anticoagulants like warfarin are switched over subsequently. Its unique metabolism, protein binding and excretion require careful monitoring and serial follow up. Warfarin should always be overlapped for 3–5 days with heparin due to its late onset of action [8]. Thrombectomy or nephrectomy may be needed in certain clinical scenarios [10,11].

In the present case, the patient had no haematuria. The reason for this unusual presentation may be a partially occluding thrombus, thereby not leading to considerable intrarenal hypertension and consequential haematuria. This is the first case to the best of our knowledge with isolated renal vein and inferior vena cava thrombus in a patient with blunt trauma and without haematuria that was successfully managed with anticoagulant therapy.

## Conclusion

Isolated renal vein and inferior vena cava thrombus following blunt trauma is rare. Contrast enhanced computed tomography imaging confirms the diagnosis. Conservative approach favoured in stable patients. Anticoagulants strongly recommended for prevention of thromboembolism. Thrombolytics or filter placement should be considered in acute settings.

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## Declaration of competing interest

None.

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