Traumatic Renocaval Fistula With Pseudoaneurysm Leading To Renal Atrophy

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Citation

M Kukkady, A Deena, S Raj, Ramachandra. *Traumatic Renocaval Fistula With Pseudoaneurysm Leading To Renal Atrophy*. The Internet Journal of Radiology. 2006 Volume 6 Number 2.

Abstract

Traumatic fistula involving renal artery and inferior venecava is a rare event following blunt abdominal injury. Hypertension and rupture are the most important complications of renal artery injury. The majority of renal injuries sustained during blunt abdominal trauma are contusions and minor parenchymal lacerations amenable to nonoperative management. Deep parenchymal lacerations, urinary extravasation, and mild to moderate degrees of parenchymal devascularization may also be treated conservatively. In the presence of massive hemorrhage or continuous hematuria in patients with trauma-induced pseudoaneurysm or fistula, aggressive therapy may become necessary. Accepted indications for surgery are avulsion of the renal pelvis, injuries to the vascular pedicle, and life-threatening hemodynamic instability (1). Vascular injury can also be effectively treated with angiographic procedures; superselective renal embolization
We report a case of patient following road traffic accident.

INTRODUCTION

Renal vascular injuries such as pseudo aneurysm, transection, thrombosis, dissection and arteriovenous fistula formation are unusual but well recognized consequences of blunt abdominal trauma.Pseudoaneurysm complicating blunt renal trauma represent significant causes of secondary haematoma, potentially life threatening.Arteriovenous fistulas may cause significant haemodynamic changes. Conservative treatment is increasingly accepted as the preferred approach to most renal injuries ($_2$).

CASE HISTORY

A thirty year old lady was brought to A & E following RTA. Triphasic CT abdomen was performed. It revealed an extrarenal pseudoaneurysm arising from right renal artery in all phases of study but was clearly demonstrated on arterial phase (fig.2).In addition fistulas communication between right renal artery and suprarenal inferior venecava was demonstrated. Transient enhancement of inferior venecava simultaneous and to the same degree as that of abdominal aorta confirmed arterio-venous shunting(fig.1.).

There was early enhancement of portal and renal vein in the arterial phase with poor contrast enhancement of kidneys even in delayed scans. Posterior perinephric haematoma was also seen.

Figure 1

Figure 1: CT section in arterial phase showing early enhancement of the suprarenal IVC almost to the same as that of abdominal aorta suggesting presence of an arteriovenous fistula.

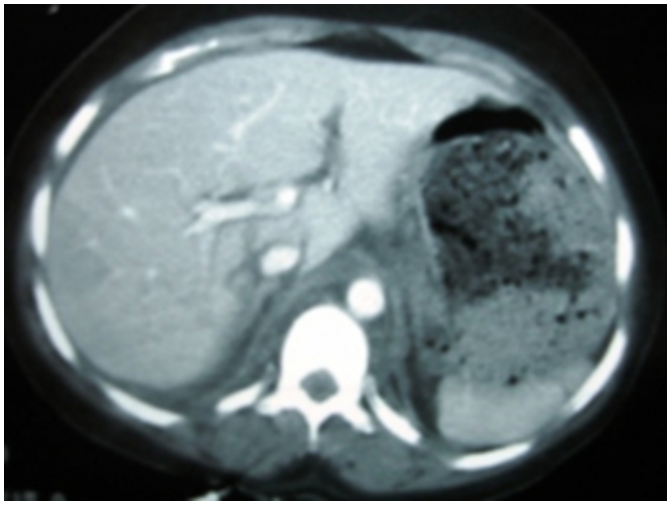


Figure 2

Figure 2: CT in arterial phase shows retroperitoneal pseudoaneurysm medial to the right kidney communicating with the right renal artery and IVC , associated perinephric haematoma.

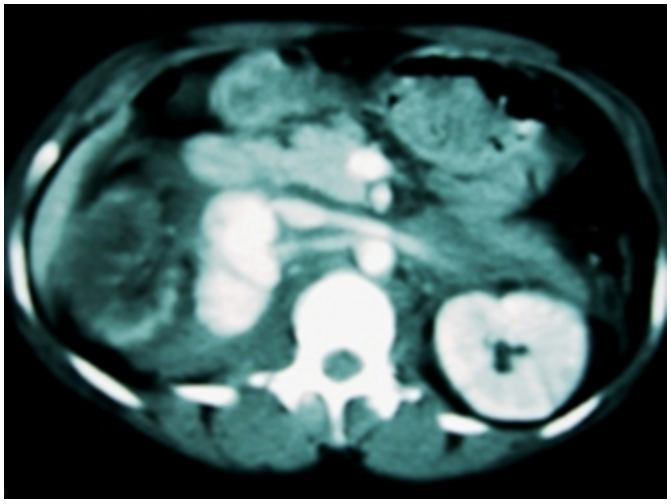
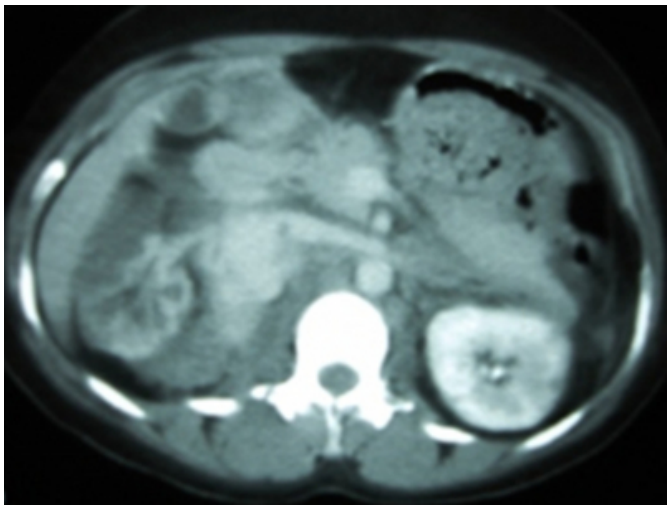


Figure 3

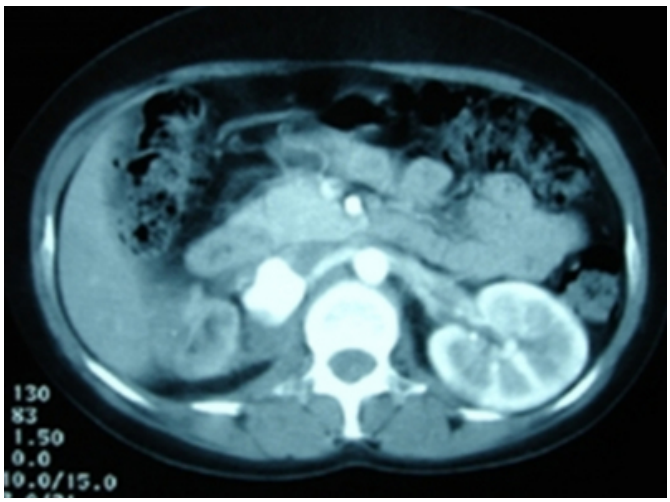
Figure 3: CT in venous phase shows retroperitoneal pseudoaneurysm medial to the right kidney distinctly communicating with IVC, associated haematoma noted in the perinephric space on the right side



CT performed after two weeks showed decrease in size of pseudoaneurysm as well as of the perinephric haematomas (fig.4) .

Figure 4

Figure 4: 12 days following blunt abdominal injury in motor vehicle accident , the CT in arterial phase shows decrease in size of the retroperitoneal pseudoaneurysm which is seen medial to the right kidney and communicating with the right renal artery, associated haematoma in the perinephric space on the same side has also reduced .



Renogram performed fourteen days after the trauma revealed ten percent function on right side (fig.5.)

Figure 5

Figure 5: Tc99m MAG-3 Renal scan with captopril shows poor visualization of right kidney and a normally visualized left kidney , the split renal function was 90% by the left kidney and 10% by the right kidney

On angiography the right renal artery four cm distal to its origin was seen to open into a pseudoaneurysm which directly communicated with the inferior vena cava thus confirming the diagnosis made on CT(fig5-6).

Figure 6

Figure 6a: Selective right renal angiogram using a 4 F cobra catheter shows right renal artery fully opening into a post traumatic pseudo aneurysm which is directly communicating with inferior vena cava and perfusion to residual renal parenchyma is noted through indirect collaterals via right supra renal artery

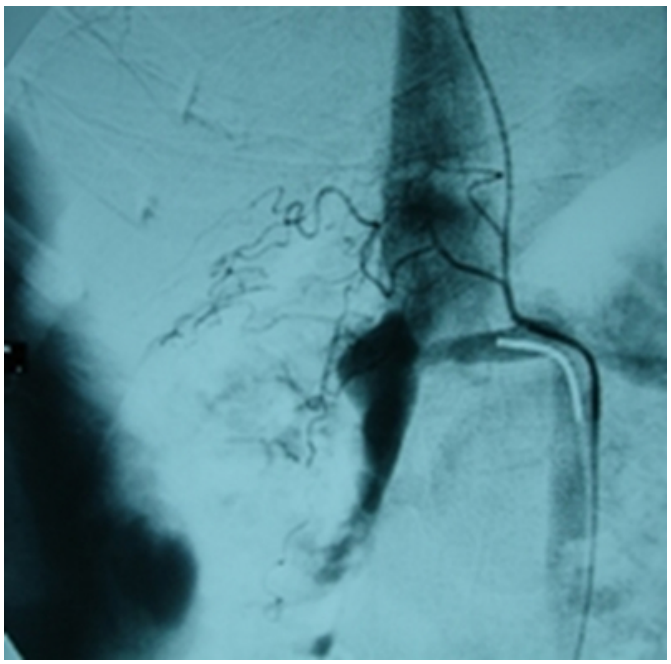
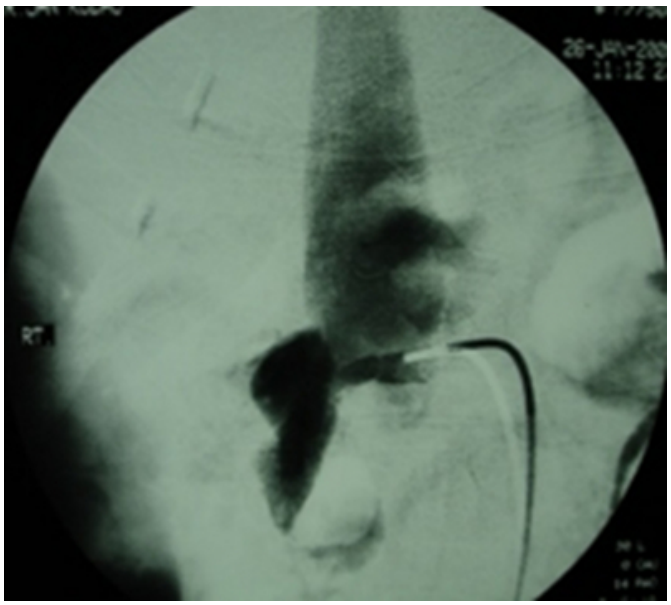


Figure 7

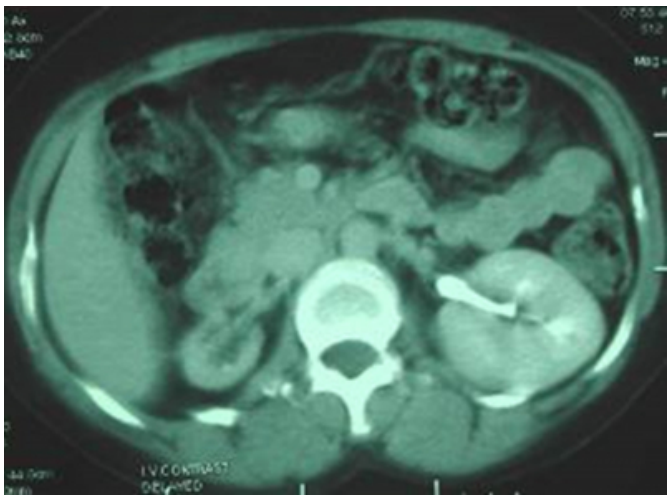
Fig 6b: Selective right renal angiogram using a 4 F cobra catheter shows right renal artery fully opening into a post traumatic pseudo aneurysm which is directly communicating with a well opacified enlarged inferior vena cava



As patient was asymptomatic either in the form of haematuria or hypertension, she was managed conservatively . Follow up CT done after a year showed atrophy of Right kidney with total disappearance of pseudoaneurysm.No fistulas communication could be demonstrated at this time (fig.7.)

Figure 8

Figure 7: CT after one year showing reduction in size of Rt kidney. No pseudoaneurysm or fistula demonstrated.



DISCUSSION

Rena injuries are classified into five grades of severity according to the American Association of Surgeons in trauma organ injury severity scale ([3]). Renal arterial injury is classified under grade five ([3]).Vascular injury account for only 5.5% of cases Renal injury occurs in 8-10% of patients with abdominal trauma ,and most of such injuries are caused by blunt trauma ([1]). Renal artery inferior venecava fistula although frequently reported in patients after penetrating trauma has rarely been described after blunt torso trauma ([1]). Hypertension and rupture are the most important complications of renal artery injury. In patients with blunt trauma ,direct impact or rapid deceleration causes contusion, laceration, or rupture in the kidney and can result in unrecognized full thickness arterial injury ([1]).In some cases, pseudoaneuyrsm form several days after injury. Rupture of a pseudoaneurysm into the adjacent viscus presents as intermittent arterial bleeding into urinary tract .Bleeding into the renal collecting system causes haematuria and, in rare cases, may produce hemorrhagic shock or renal insufficiency from clot retention. Devascularisation of the entire kidney due to laceration or in situ thrombosis of main renal artery constitutes the most severe form of renal injury (grade 5).The classical findings of traumatic renal infarct include absent nephrogram, retrograde opacification of the renal veins from inferior venecava ,and abrupt truncation of the renal arterial lumen at the point of occlusion. The cortical

rim nephrogram sign of devascularised kidney may be absent in acute setting.

Renal artery injuries with devascularised kidney should be treated with prompt surgical revascularisation within four hours of injury to minimize the risk of irreversible loss of renal function ([3]). If renal ischemia has exceeded four hours and the contralateral kidney is normal, most urologists will avoid surgery and allow the devascularized kidney to atrophy(as in our case). If devascularizing injuries are bilateral or involve a solitary kidney, reconstructive surgery is generally attempted even if the ischemia time has exceeded four hours ([3]). The only absolute indication for surgical exploration is life-threatening renal bleeding ([3]). Relative indications for operative management include the presence of (a) extensively devitalized tissue (>50% of the renal parenchyma), (b) urinary extravasation that cannot be controlled with conservative means such as ureteral stent placement or nephrostomy, and (c) arterial thrombosis (3). Vascular damage resulting from penetrating and from blunt renal trauma can be treated effectively with superselective catheter embolization

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