Traumatic Renal Artery Thrombosis in a Child – A case Report

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ABSTRACT

Introduction: Blunt abdominal injuries are common in children with liver, spleen and kidneys being more commonly injured. Of these, renal trauma account for 10% of these injuries. **Case Report:** We have presented a case of blunt abdominal trauma leading to renal artery thrombosis which was managed conservatively. **Conclusion:** Prompt diagnosis and conservative management usually leads to successful outcome and unnecessary laparotomies are thereby avoided.

Key Words: Blunt abdominal trauma, Children, Renal artery thrombosis

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INTRODUCTION:

In paediatric age group, renal trauma occurs in approximately 10% of all abdominal trauma cases, with blunt trauma accounting for 85% of all renal injuries [1, 2]. Children are susceptible to more renal injuries than adults because of important anatomic differences-their kidneys are larger in proportion to overall body size and have more lobulations and less protection from the immature rib cage and flank musculature and the lower volume of perirenal fat [3].

Preservation of renal tissue and minimizing patient morbidity should be the aim of managing paediatric renal trauma. Fortunately, 90% of blunt paediatric renal trauma can be managed non-operatively [4, 5]. The incidence of renal artery thrombosis is approximately 0.1% with only about 400 cases reported in literature. Early diagnosis and treatment as soon as possible are required to preserve renal function.

CASE REPORT:

An 11 years boy presented with history of blunt trauma abdomen due to fall from tempo 1 day back with complaints of right sided abdominal pain. There was no history of haematuria or ascites. His vitals were stable. There was tenderness over right flank, right iliac fossa and supra-pubic region and graze abrasion was present over right side back. Rest of the examination was normal.

Blood coagulation profile and renal function tests were normal. Contrast Enhanced Computed Tomography (CECT) Scan was done which was suggested of Grade V right renal injury with dissection and thrombosis of right renal artery with devascularization of right kidney. There was grade I liver laceration and retroperitoneal haematoma was present.

IMAGE 1: CECT Scan showing thrombus in Right Renal Artery.

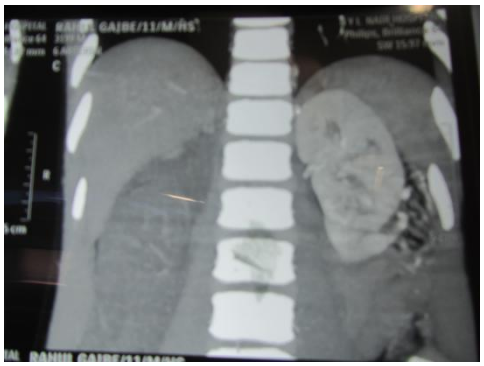

IMAGE 2: CECT Scan showing Right non-functioning Kidney and Left Normal functioning kidney.

The patient was managed conservatively with bed rest. Repeat CECT Scan after 48 hours showed organized haematoma. Renal Scan suggested non-functioning left kidney and normally functioning right kidney.

The patient is on regular follow-up since last one and half years with no complaints at present. He is being regularly monitored for Blood Pressure which is constantly normal. Renal scan was repeated after one year which showed no function of right kidney and normally functioning left kidney.

DISCUSSION:

Although commoner in paediatric age group, about 85% of pediatric renal injuries are relatively minor, with grade I and II

contusions and minor parenchymal lacerations predominating. Traumatic renal artery occlusion is rare. The overall incidence of paediatric renal artery injuries is reported to be 0.05–0.1% in various studies [6, 7].

The pathogenesis of renovascular injuries due to blunt trauma is thought to be caused by rapid deceleration, which results in stretching of the renal vasculature, arterial intimal disruption and thrombosis. Such type of injury usually occurs more commonly on the left side because the right renal artery is longer than the left and may be better able to withstand the stretching caused by deceleration [7]. But this was not true with our patient who had right renal arterial thrombosis.

CECT Scan is the preferred modality for evaluation & follow-up. Selective renal angiography remains the gold standard for diagnosing renal artery injury, since it has the highest sensitivity and specificity. However, as a diagnostic tool it is reserved only for selected patients with a high level of suspicion for blunt renal artery injury and a non-conclusive CT scan [8].

The management of a relatively severe renal injury in a hemodynamically stable patient is controversial and depends on the time to diagnosis, type and extent of the vascular injury, and also upon the extent of the associated injuries. Treatment options include immediate surgical revascularization, nephrectomy, and non-operative therapy [9].

It is very obvious that surgical revascularization or stent placement should be attempted in patients with bilateral injury or a solitary kidney [6], the success being defined by the deferral of dialysis. In contrast, the optimal treatment in unilateral renal artery injury in a patient with two kidneys like our case is a dilemma and a matter of controversy [7]; such cases had been traditionally treated by nephrectomy, but nowadays renal preservation is considered whenever possible. Treatment options to do so are being developed [10].

Non-operative management is currently the accepted therapeutic option in most patients with traumatic collusion of the main renal artery [7]. Our patient was managed by this approach. The main reason for attempting revascularization of a

unilateral traumatic renal arterial thrombosis is to preserve sufficient renal function in order to avoid the need for renal replacement therapy if the patient ever loses the contra-lateral kidney. The second purpose of revascularization is to prevent renovascular hypertension, which is a major problem after conservative treatment renal artery occlusion [7].

Surgical revascularization after renal artery occlusion requires special expertise. The results of surgical revascularization have been poor and long-term preservation of renal function has been seen in less than 25% of patients [11]. There have been very high rates of recurrent thrombosis [11]. Considering these poor results, most surgeons have concluded that operative renal artery revascularization should be avoided when there is a functioning contra-lateral kidney [12]. Moreover, the presence of other life-threatening associated injuries takes a high priority. These situations have resulted in a shift toward a more conservative approach to this kind of injury.

Recently, there have been reports about percutaneous revascularization by endovascular stenting in stable patients with unilateral renal artery occlusion [7]. However, the feasibility and effectiveness of this modality has not been confirmed [13]. Also there is controversy regarding the optimal time of intervention. Prolonged ischemia time due to delay in diagnosis, if more than 12 h the chances to recover the kidney function are dismal. Despite an improvement on the warm ischemia time in some studies, there was lack of correlation with retrieval of the renal function. The critical time to save the kidney may be shorter than 2–3 hours and usually this time elapse before revascularization of the kidney is achieved [14].

A review of the literature suggests that if renal function and vital signs are normal, invasive treatment such as surgical or endovascular revascularization may not be necessary, because medical treatment alone with strict blood pressure control is as effective as surgical management [7].

The follow-up of these conservatively managed patients is very important. One of the most important complications is renovascular hypertension. About 25–50% of these patients will develop hypertension; most patients who develop renovascular

hypertension, most within the first year after the trauma [7]. However, the incidence of hypertension is less in pediatric cases of renal artery occlusion (0%-6.6%) [7, 11].

The reason for this may be age and absence of age-related vascular disorders already present before the time of trauma [15]. Our patient has not yet developed hypertension about 1.5 years of the trauma The studies have also shown that the kidneys may have a potential for spontaneous recovery even long after occlusion because of the development of sufficient collaterals [16, 17]. But the incidence and the factors related to this late spontaneous recovery are not yet established [7]. Because of the patient's stable vital signs and normal renal function, we elected to manage him conservatively

CONCLUSION:

Most of the blunt paediatric renal trauma can be managed conservatively. Traumatic renal artery thrombosis is even rare. Early diagnosis and prompt management are essential to avoid unnecessary laparotomies. Conservative management has good outcome.

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