

DO WE NEED TO OPERATE IN POST-TRAUMATIC RENAL TRANSECTION WITH BLEEDING? PATIENT COMES TO HER OWN AID IN SOLVING THE DILEMMA – A CASE REPORT

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ABSTRACT

High-grade renal injury occurs predominantly in pediatric population when compared to adults. Non-operative management is advocated in stable patients irrespective of the grade of injury and intervention is recommended in unstable patients. Children presenting with active bleeding are a source of treatment dilemma because of the limited amount of circulating blood volume and the ease with which they can go in to shock with a small amount of blood loss. Here, we report a 9-year-old girl who on evaluation following blunt trauma was found to have complete transection of the upper pole of right kidney with large perinephric hematoma. She was initially managed conservatively, but the plan changed to intervention on the 2nd day because of significant hemoglobin drop and hypotension. Renal Angiography was done before surgical procedure to see for the feasibility of minimal intervention procedure. It revealed active bleeding from an accessory upper polar renal artery, and we then proceeded with selective embolization of the accessory upper polar artery. Patient's own vascular anomaly helped us solving the dilemma as embolization could be done without significant risk of migration. Following embolization, the bleeding stopped and she had an uneventful recovery. This case highlights the need of using minimal intervention procedures before resorting to surgery in post-traumatic renal injuries and treating these patients in tertiary care centres where all the facilities are available.

KEYWORDS: High grade renal injury, complete transection of upper pole, renal angiography, selective angioembolization of accessory upper polar artery.

INTRODUCTION

Blunt trauma abdomen accounts for approximately ninety percentage of renal injuries in children.^[1] This is due to the lack of costal protection, weaker abdominal musculature and decreased perirenal fat in children when compared with adults.^[2, 6] Renal injuries can range from minor contusion to complete avulsion of renal pedicle, graded according to American Association for Surgery of Trauma (AAST).^[3] Conservative management is undertaken in children with grade I – III renal trauma and majority of grade V injuries are treated surgically.^[1] Grade IV injuries are a source of treatment dilemma in children because of the limited amount of circulating blood volume and the ease with which they can go in to

shock with a small amount of blood loss. If the child is unstable despite adequate resuscitative measures, surgery is frequently resorted to. We present our experience in managing a case of grade IV renal injury having complete transection of upper pole with a minimal invasive technique because of the presence of an accessory renal artery.

CASE HISTORY

A 9-year-old girl presented with alleged history of fall from height, sustaining blunt trauma to the right side of abdomen. She had history of abdominal pain, vomiting and one episode of hematuria following the injury. At presentation she was in hypotension with mild pallor.

Abdominal examination revealed a vague mass in right hypochondrium with diffuse tenderness on right side of abdomen, and fullness at renal angle. Other systemic examination was unremarkable. Urine analysis showed

plenty of RBC's and Ultrasonography of abdomen showed a heterogenous mass lesion occupying the hepato-renal pouch displacing the kidney anteriorly and inferiorly (fig.1).

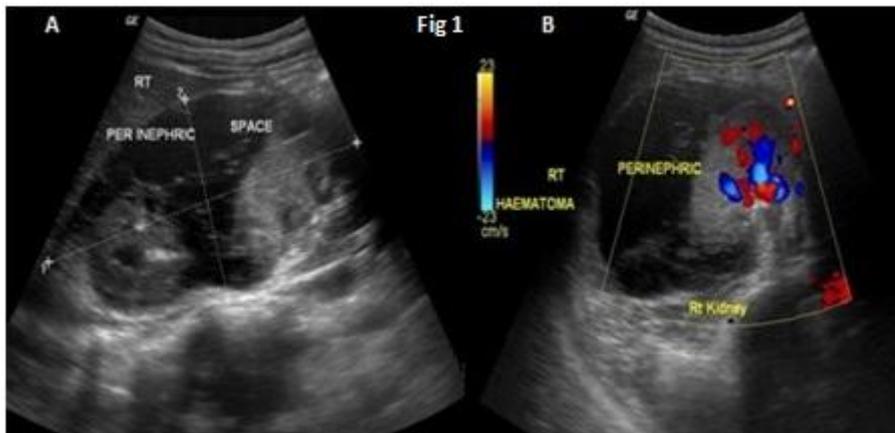
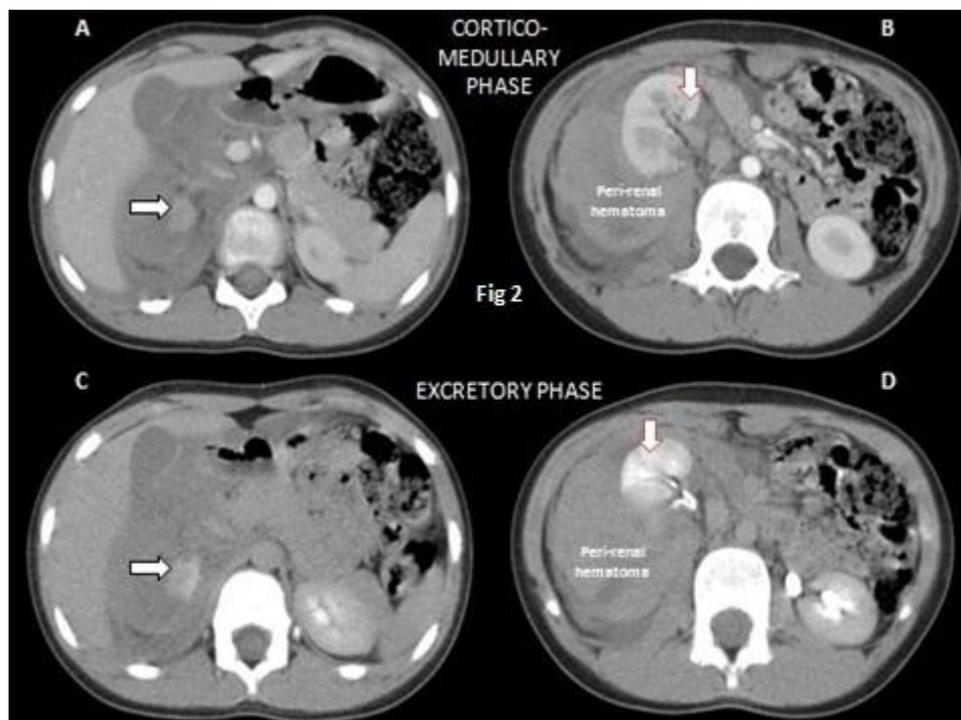


Figure 1A shows completely transected upper pole of right kidney with perinephric hematoma. Figure 1B shows Doppler image of right kidney with adequate blood supply of lower pole.

Contrast enhanced CT showed complete transection of upper pole of right kidney with large perinephric hematoma (fig.2).



Contrast enhanced computerized tomography showing complete transection of right upper pole with large perirenal hematoma and normal left kidney. Figure 2A&B shows cortico-medullary phase with uptake in right upper and lower pole. Figure 2C&D shows excretory phase with minimal contrast extravasation.

Initially, she was managed conservatively in intensive care unit with complete bed rest, bladder drainage, prophylactic antibiotics and 2 units of blood transfusions.

On the 2nd day she deteriorated, with clinically expanding hematoma and significant drop in hematocrit. So, we planned for surgical intervention and shifted the

patient to operation theatre. As the interventional cardiology suit was in the same theatre complex we opted for Renal Angiography before surgical procedure to see for the feasibility of minimal intervention

procedure. It revealed fresh bleeding from an accessory upper polar renal artery and we then proceeded with selective embolization of the accessory upper polar artery with gel foam (fig.3).

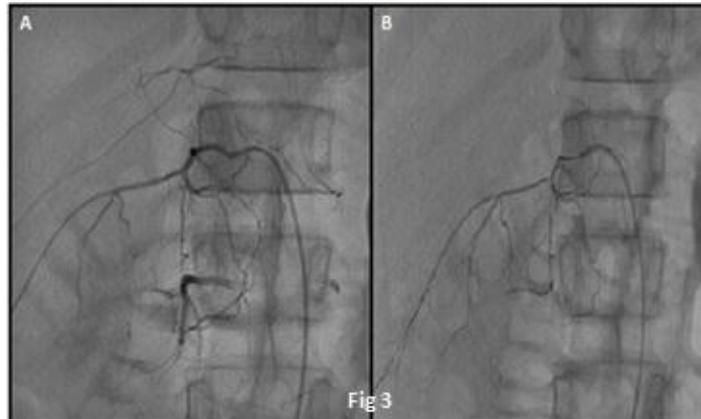


Figure 3A shows accessory right renal artery with contrast extravasation. Figure 3B shows post embolization image with complete occlusion of right accessory upper polar artery

Patient was closely monitored post operatively for further drop in hematocrit or increase in hematoma; fortunately the patient had an uneventful recovery following embolization with resolution of hematuria. She was discharged on 10th day post-angioembolization and advised complete bed rest for one month. She was

followed up with monthly ultra sonogram, which showed resolution in the size of hematoma, and intravenous urography at 3 months showed normal functioning kidneys with non-visualization of right upper pole calyx (fig.4).



Figure 4 shows post embolization Intravenous Urogram with normal functioning left renal unit, non-visualization of right upper pole and normal excretion of right mid and lower pole

At 6 months of follow-up, she was asymptomatic and was able to do her normal activities.

DISCUSSION

Conservative management for blunt renal trauma has become the standard of care for low-grade renal injuries (AAST grades 1-3) and majority of grade V injuries are treated surgically. However the management of Grade IV injuries is still controversial.^[1] Many of these patients ultimately land up with renal exploration and nephrectomy. The absolute indications for exploratory laparotomy are life threatening hemodynamic instability and expanding or pulsatile hematoma; the relative indications are suspected renal pelvis or ureteral injury and persistent bleeding.^[1] High grade injuries with collecting duct injuries are usually associated with urinary extravasation and large urinomas, which are managed by either endo-urolological or percutaneous approach.^[3] Although surgical management is ideal for severe blunt renal trauma,^[4] most surgeons prefer minimally invasive approach; this is because the rate of renal loss is higher with surgical intervention.^[3, 6]

Pediatric blunt renal trauma has a varied presentation of clinical signs than adults. Tachycardia is the earliest sign of volume loss, where as hypotension is elicited later; this may be due to the enhanced vasoconstrictive response^[5] by the vessels and the outpouring of catecholamines in younger children.^[1] Our patient presented with hypotension and tachycardia, which was initially managed with blood transfusion and later with selective trans-arterial embolization of the upper pole renal artery.

Super Selective Trans-arterial embolization has become a popular form of non-operative management nowadays in order to reduce the unnecessary surgical intervention.^[7] The rates of organ salvage have been shown to be excellent when treated with super selective trans-arterial embolization.^[8] However, it has the risk of unintentional embolization of non-target areas. In our patient, we planned for angiography followed by surgical exploration, but fortunately during angiography we identified an accessory right renal upper polar vessel supplying the upper pole with significant bleeding in to the perirenal area. Hence we proceeded with selective embolization of accessory right renal upper pole artery with gel foam. Patient's own vascular anomaly helped us solving the dilemma as embolization could be done without significant risk of migration.

Based on the case, we recommend the following:

1. Minimal intervention procedures should be tried before resorting to open surgical procedure.
2. This type of patients should be treated in tertiary-care facilities where all the facilities are available.

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REFERENCES

1. Thomas H. Lynch, Luis Martinez-Pineiro, Eugen Plas et al. EAU Guidelines on Urological Trauma. *Eur Urol* 2005; 47: 1–15.
2. Costa Healy, Mohamed Hobeldin and Anies Mahomed. Conservative management of grade IV renal injury with complete transection: a case report. *Cases J* 2008; 1: 129.
3. Surya V. Prakash, Chandra G. Mohan, Vijaya Bhaskar G. Reddy et al. Salvageability of kidney in Grade IV renal trauma by minimally invasive treatment methods. *J Emerg Trauma Shock*. 2015 Jan-Mar; 8(1): 16–20.
4. Seiji Morita, Sadaki Inokuchi, Tomoatsu Tsuji et al. Arterial embolization in patients with grade-4 blunt renal trauma: evaluation of the glomerular filtration rates by dynamic scintigraphy with 99mTechnetium-diethylene triamine pentacetic acid. *Scand J Trauma Resusc Emerg Med* 2010; 18: 11.
5. Wei-Ching Lin, Chien-Heng Lin. The role of interventional radiology for pediatric blunt renal trauma. *Ital J Pediatr* 2015; 41: 76.
6. Serpil Sancar, Cagatay Aydinler, Mete Kaya. Nonoperative treatment of blunt renal trauma with urinary extravasation in a child. *Ped Urol Case Rep* 2014; 1(2): 12-17.
7. Bryan B. Voelzke, Laura Leddy. The epidemiology of renal trauma. *Transl Androl Urol* 2014; 3(2): 143-149.
8. Hans-Peter Dinkel, Hansjorg Danuser, Jurgen Triller. Blunt Renal Trauma: Minimally Invasive Management with Microcatheter Embolization - Experience in Nine Patients. *Radiology* 2002; 223: 723–730.