Abstract
Blunt renal artery injury is a relatively rare finding. The literature demonstrates an incidence as low as 0.08% of all blunt abdominal traumas, occurring in 1–4% of patients with renal injury. However, the rate of early diagnosis of such injuries is increasing due to increased awareness and the liberal use of contrast-enhanced computed tomography. In this report, we describe an approach to re-vascularization by endovascular stenting that resulted in successful salvage of renal function after blunt trauma.

Key Words: Blunt renal artery injury, computed tomography, endovascular stenting

Introduction
Renal artery stent placement is well-established for the elective treatment of atherosclerotic vascular disease. However, the success of endovascular stenting in the management of this is poorly documented.

Case Report
A 26-year-old motorcyclist was admitted to the trauma unit 4 h after being involved in a road traffic accident. Upon admission, he was fully conscious and hemodynamically stable. He complained of loin pain. He sustained right pneumothorax and tiny parenchymal lung contusions, left radius and ulna fracture.

Contrast-enhanced computed tomography (CT) of chest and abdomen revealed left renal artery dissection with decreased perfusion of left kidney and no other visceral organ injuries [Figure 1a and b]. Delayed scans taken did not show any collecting system injuries. The patient had normal serum creatinine levels. In view of the acute renal artery injury, without any other major organ injury, he was shifted to interventional suite for further treatment and renal salvage.

Diagnostic angiogram of renal arteries was done which confirmed the CT angiogram findings and left main renal artery showed early bifurcation with dissection immediately distal to the branching and at the proximal upper polar branch [Figure 2a and b]. In the absence of other visceral organ injury and normal renal parameters, after discussion with general surgeon and urologist, the case was taken for renal artery stenting in the same sitting.

The diagnostic catheter was exchanged for a 7F guide catheter (Renal guide - Cordis). The dissection was crossed with a 0.014 micro wire (BMW guide wire-GUIDANT), and 6 mm × 15 mm stent (DY Namic renal stent-BIOTRONIK) was placed in the larger artery and 2.75 mm × 14 mm (ENDEAVOR sprint-MEDRONIC) stent was placed in the upper polar branch. Good antegrade flow was noted. The patient was given 300 mg clopidogrel in the angio suite prior to stenting. Creatinine levels after procedure were normal.

The patient made an uneventful recovery and was discharged 5 days after the procedure.

A repeat CT angiogram was done at 8 weeks follow-up after assessing the renal parameters which were within normal limits. CT angiogram revealed both the stents in position with good antegrade flow [Figure 3]. Delayed phase images show improvement in renal perfusion.

Discussion
CT scan is the preferred imaging modality for blunt renal artery injury (BRAI) in a stable trauma patient. While laceration of the renal parenchyma and surrounding perirenal hematomas are diagnosed without difficulty on CT, diminished contrast enhancement is often subtle and can easily be overlooked in light of other solid organ injuries.

In our case, CT clearly depicted dissection in proximal left main renal artery with focal occlusion. Few well-defined nonenhancing hypodense areas were seen in the upper

Access this article online

Website: www.indjvascsurg.org

DOI: 10.4103/0972-0820.180222

How to cite this article: Raavi S, Krishnaswami M, Gnanaprakasam F, Ramachandran M. Acute Posttraumatic Renal Artery Dissection Treated by Primary Stenting. Indian J Vasc Endovasc Surg 2016;3:33-5.

Received: January, 2016. Accepted: February, 2016.
sensitivity and specificity. However, as a diagnostic tool, it is reserved only for selected patients with a high level of suspicion for BRAI and a nonconclusive CT scan. In our current practice, catheter angiography provides a platform for the endovascular treatment of BRAI in selected patients. The management of BRAI remains controversial and has been the center of much debate in the last 30 years. In more than two-thirds of patients, there may be associated intra-abdominal and extra-abdominal injuries. Those injuries not only contribute to higher morbidity and mortality, but also influence the timing and method of treating renal artery injuries.

Renal artery stent placement is a well-established technique for the elective treatment of atherosclerotic vascular disease. Renal artery stenting in the trauma setting has been described in a collection of case reports; there were no reported complications related to the procedure and renal function was preserved in all reviewed cases. The long-term success of endovascular stenting in the management of BRAI has not been previously documented. Surgical exploration has been associated with mortality rates of 9–20% because of concomitant injury to other organ systems. The results of successful renal salvage following surgical repair are also disappointing, ranging from 20% to 30% in most large series.

Endovascular stenting of renal arteries has a limited role in the traumatically injured patient, since maintaining stent patency requires anticoagulation, which is not always possible in the context of other bleeding sites. In our case, there is no other visceral organ injury, coagulation is not a problem. If the detection of renal artery thrombosis is delayed, the kidney may be atrophied and lead to delayed nephrectomy if hypertension develops.

Once a renal artery injury has been established, surgical re-vascularization has historically been the treatment of choice, but its success has been limited.

Long et al. reported a series of four patients who underwent endovascular re-vascularization of renal trauma. Two patients died from associated lesions and two had a nonfunctioning kidney (one stent thrombosis and one nonfunctioning kidney despite a patent renal artery).

Goodman et al. reported successful stenting of a traumatic renal artery intimal tear and anticoagulating the patient with therapeutic levels of heparin, and later coumadin, for 2 months. The stented kidney had near normal function 9 months postoperatively.

**Conclusion**

Early detection of BRAI can be detected by CT scan which also acts as a road map for planning and intervention. Endovascular management for blunt renal artery dissection is safe and feasible if an early diagnosis is made. This approach can be used as an alternative to surgical re-vascularization in most cases.
Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References
1. Abu-Gazala M, Shussman N, Abu-Gazala S, Elazary R, Bala M, Rozenberg S, et al. Endovascular management of blunt renal artery trauma. Isr Med Assoc J 2013;15:210-5.
2. Sangthong B, Demetriades D, Martin M, Salim A, Brown C, Inaba K, et al. Management and hospital outcomes of blunt renal artery injuries: Analysis of 517 patients from the National Trauma Data Bank. J Am Coll Surg 2006;203:612-7.
3. Haas CA, Dinchman KH, Nasrallah PF, Spirnak JP. Traumatic renal artery occlusion: A 15-year review. J Trauma 1998;45:557-61.
4. Rosenschein U, Kaganovich Y, Machoul N, Storch S. Treatment of hypertension by renal artery stenting. Isr Med Assoc J 2004;6:445.
5. Memon S, Cheung BY. Long-term results of blunt traumatic renal artery dissection treated by endovascular stenting. Cardiovasc Intervent Radiol 2005;28:668-9.
6. Dinchman KH, Spirnak JP. Traumatic renal artery thrombosis: Evaluation and treatment. Semin Urol 1995;13:90-3.
7. Master VA, McAninch JW. Operative management of renal injuries: Parenchymal and vascular. Urol Clin North Am 2006;33:21-31, vi-vi.
8. Tillou A, Romero J, Asensio JA, Best CD, Petrone P, Roldan G, et al. Renal vascular injuries. Surg Clin North Am 2001;81:1417-30.
9. Long JA, Manel A, Penillón S, Badet L, Sessa C, Descotes JL, et al. Traumatic dissection of the renal pedicle. Modalities of management in adults and children. Prog Urol 2004;14:302-9.
10. Goodman DN, Saibil EA, Kodama RT. Traumatic intimal tear of the renal artery treated by insertion of a Palmaz stent. Cardiovasc Intervent Radiol 1998;21:69-72.