

# Proximal Ureteric Injury: An Unusual Complication of Percutaneous Renal Biopsy

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## Abstract

A 30-year-old male developed fever and unrelenting left loin pain following an ultrasound-guided percutaneous left renal biopsy for proteinuria discovered on routine health checkup. On contrast computed tomography imaging, the left proximal ureteric injury along with a small urinoma was identified. The left ureteric double J (DJ) stenting was performed successfully following which the patient was relieved of his symptoms. It is necessary to have a high index of suspicion and a low threshold for imaging for patients who develop even minor symptoms following percutaneous renal biopsy. Partial ureteric injuries can be subjected to endoscopic management in the form of DJ stenting. Complete ureteric tear is rare but possible and needs a definitive surgical repair. Large urinomas and hematomas require placement of percutaneous drain and/or nephrostomy. In case of unrelenting hematuria or an expanding hematoma, angioembolization may be necessary. Finally, if all measures fail and patient continues to deteriorate, nephrectomy may be the last resort.

**Key words:** Complications, Renal biopsy, Stenting, Ureteric injury

## BACKGROUND

Percutaneous renal biopsy is an extremely common procedure performed routinely by nephrologists. Complication rates are low if a strict protocol is followed.<sup>[1]</sup> However, one should have an eagle's eye view of the patient following biopsy and subject the case to immediate imaging if any suspicion of a complication emerges. Timely intervention in the form of endoscopy, nephrostomy placement, or angioembolization can prevent further renal damage and reduce morbidity.

## CASE REPORT

A 30-year-old overtly healthy male underwent routine health check-up and was found to have proteinuria (3+) and

microscopic hematuria (four red blood cells/high-power field) on urine examination. After doing an ultrasound of the kidney, ureter, and bladder (KUB) which was normal, the patient was referred to a nephrologist for evaluation and he was advised to undergo renal biopsy after consultation.

The patient underwent ultrasound-guided left renal biopsy under local anesthesia by a nephrologist using an 18-gauge renal biopsy gun. Two biopsy cores were taken from the lower pole and were sent for histopathological examination. Post-procedure, the patient developed mild hematuria which lasted for a period of 10–12 h. An ultrasound of the KUB was done again at this stage which was normal. He was then discharged the next day after hematuria settled, with oral analgesics for his complaints of the left loin pain. Following discharge, the patient experienced continuous non-radiating left loin pain and also developed 100.4° Fahrenheit fever which settled with antipyretics. Unable to tolerate the pain, the patient came to emergency room 1 day later.

## INVESTIGATIONS

After confirmation of normal renal function (serum creatinine = 1.1 mg/deciliter), the patient was advised

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computed tomogram abdomen (plain + intravenous contrast) which revealed a left renal lower pole subcapsular collection along with an 18.2 cm<sup>3</sup> urinoma along the left iliopsoas muscle [Figure 1a]. On delayed contrast images, contrast extravasation was noted from the proximal left ureter. Contrast was seen entering left distal ureter and into the bladder suggestive of partial ureteric tear [Figure 1b].

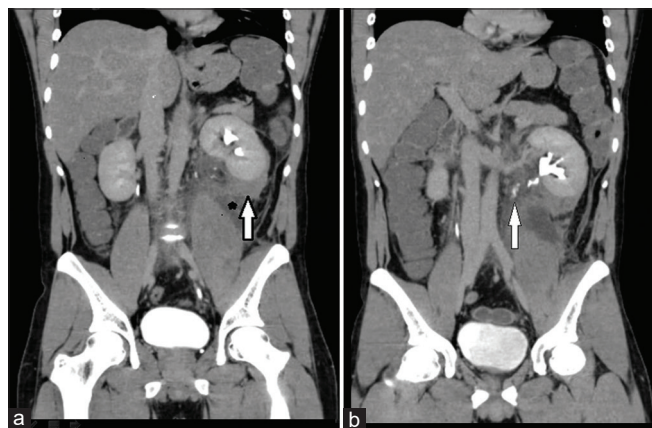
## TREATMENT

On admission, a urology consultation was sought for the patient and after reviewing the case, a decision was taken to attempt left ureteric double J (DJ) stenting for him. The patient underwent the procedure under regional anesthesia under antibiotic cover and the findings of partial proximal ureteric tear were confirmed intraoperatively through retrograde pyelography (RGP) [Figure 2a and b]. Procedure was uneventful and the patient was discharged the next day once he was asymptomatic and after X-ray KUB confirmed left DJ stent in position [Figure 2c].

## OUTCOME AND FOLLOW-UP

The renal biopsy which was done at the time of first admission revealed IgA nephropathy for which surveillance was advised.

Three weeks following DJ stenting, the patient underwent an ultrasound which was normal and had no residual collection, following which the stent was removed under local anesthesia. The patient was reviewed 1 month and 6 months later and was doing well with no issues (6 months follow-up was obtained over telephonic conversation).



**Figure 1:** (a) Coronal section of contrast computed tomography abdomen and pelvis showing subcapsular collection in relation to lower pole of the left kidney (arrow) and urinoma over the left iliopsoas muscle (star). (b) Contrast extravasation noted from proximal left ureter (arrow) in delayed phase

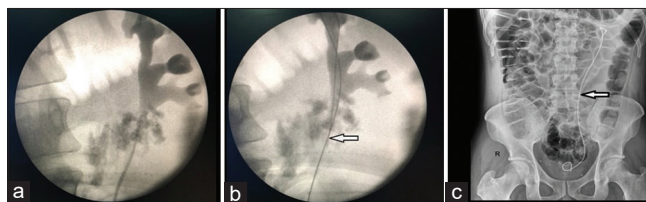
## DISCUSSION

Renal biopsy is a routinely done procedure. The use of ultrasound guidance for renal biopsy has not only improved the success rates of the procedure but has also increased safety, with <0.1% biopsies resulting in serious complications.<sup>[2,3]</sup> However, despite the development of automated renal biopsy guns, it remains an invasive procedure with the evident risk of complications such as hematuria, pain, hematoma, and fever.<sup>[4]</sup> Urinary leak and urinoma are rare complications following renal biopsy as renal parenchyma is the target and not the pelvicalyceal system.<sup>[5]</sup>

When our patient presented with continuous fever and unrelenting pain, we asked for a contrast computed tomogram with delayed phase imaging, despite the fact that his ultrasound was normal. This led to the provisional diagnosis of the left proximal ureteric injury on the basis of a small urinoma and contrast extravasation from the proximal ureter which was further confirmed on RGP. As the patient was symptomatic and there was a partial tear of the left ureter with maintained ureteric continuity, DJ stent placement proved to be an acceptable option.

## LEARNING POINTS/TAKE HOME MESSAGES

- Hematuria, hematoma, fever, and pain are common post-renal biopsy complications; however, urinoma and urine leak which require intervention should also be kept in mind.
- We should maintain low threshold for contrast imaging (computed tomography urogram/RGP) following percutaneous renal biopsy and should be performed even when the patient develops minor symptoms.
- Partial proximal ureteric injuries can be managed endoscopically (such as by DJ stenting).



**Figure 2:** (a) Retrograde pyelography showing partial tear in proximal ureter with contrast extravasation noted and rest of the contrast outlining pelvicalyceal system. (b) Guidewire (arrow) secured in the left ureter and position confirmed under fluoroscopy. (c) Post-operative X-ray kidney, ureter, and bladder region shows double J stent (arrow) in position, which was kept for 3 weeks

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