



## Endourology

## Endourological management of mucosal ureteral avulsion: Case report

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## ABSTRACT

The ureteral avulsion is the most horrific complication of ureteroscopy. The traditional treatment of ureteral avulsion is open ureteral repair. However, mucosal avulsion is a new terminology that could be managed endoscopically. Herein, we present a patient with mucosal avulsion. This case was followed-up with imaging and there wasn't any evidence of ureteral stenosis. We believe that mucosal ureteral avulsion could be managed by endourology techniques in selected patients. However, pros and cons of this treatment option should be carefully discussed with patients and long term follow up is necessary in these group of patients.

## Introduction

Ureteral calculi is a common urologic disease, and intervention by using ureteroscopy has become one of the main procedures. Ureteral avulsion is a recognized but rare and horrific consequence of ureteroscopy. This complication is an extremely rare but severe complication with a reported incidence of 0–3.70%. Incidence is also higher in proximal ureteral stones especially next to extracorporeal shock wave lithotripsy (ESWL) treatment.<sup>1</sup> Furthermore, use of basket, non-experienced urologist and, large bore (>9F) ureterorenoscopes, and ureteral inflammation are also have been reported as risk factors in some studies.<sup>2</sup>

The traditional treatment of ureteral avulsion was open ureteral repair. The surgical techniques such as uretero-ureterostomy<sup>1,3</sup> and robotic techniques. However, mucosal avulsion is new terminology which could managed endoscopically.<sup>4</sup> Herein, we present a woman with mucosal ureteral avulsion during transurethral lithotripsy, which the ureteroscope was covered with 5 centimeters of ureteral mucosa.

## Case presentations

A 45-year-old woman presented to urology clinic with moderate right flank pain from two months ago. No significant medical or family history was mentioned. The laboratory findings included: Haemoglobin: 12.2 g/dL, Creatinine: 1.2 mg/dL, Na: 143 m mol/L, K: 3.8 mmol/L, Results of her physical examination were unremarkable. The kidney, ureter and bladder ultrasonography showed right

hydronephrosis. In abdominopelvic computed tomographic (CT) scan there was moderate hydronephrosis and a 7millimetres stone in distal part of right ureter (Fig. 1).

She underwent a semi rigid ureteroscopy under spinal anesthesia and pneumatic lithotripsy and double j stent was inserted into ureter successfully. On withdrawal of the ureteroscope at the end of the procedure, it was observed that the ureteroscope was covered with 5 centimeters of ureteral mucosa (Fig. 2). In order to ensure the proper location of stent, it was checked with fluoroscopy and it seemed that the proximal end is in renal pelvis (Fig. 3).

Several management options were considered in a multidisciplinary team and with the patient. Those options included expectant management, ureteral reconstruction by either a Boari flap or psoas hitch, and auto transplantation. As the patient was symptom less and there was no evidence of abdominal tenderness, expectant management was chosen for patient.

In post-operative period, Foley catheter was reminded for three days. There was no signs of abnormal flank pain, tenderness or fever. The patient discharged with double j stent. The pathologic examination was done on extracted ureteral mucosa, and it confirmed presence of only mucosal layer. Six weeks later, the DJ stent was extracted spontaneously. In follow-up ultrasonography, the kidneys were normal without any evidence of stenosis. We planned to perform intravenous pyelography for patients, however, the patient was refused due to fear of COVID19 exposure.

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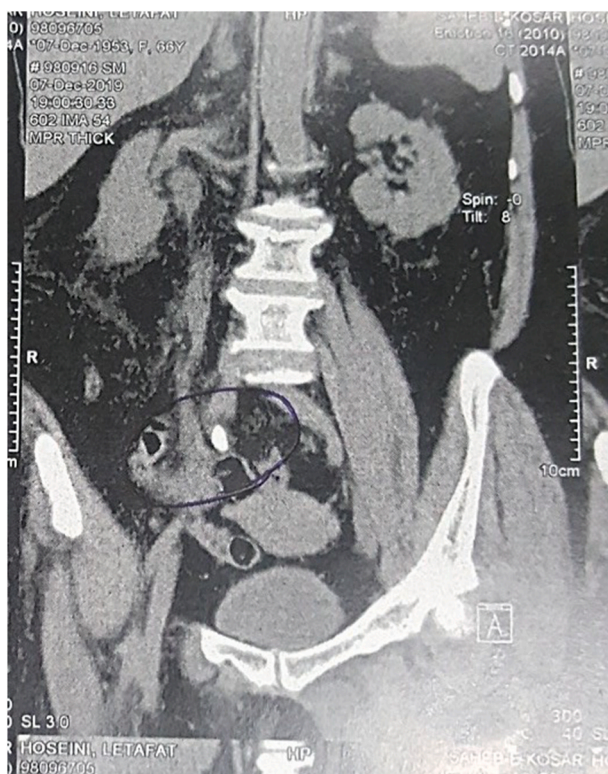


Fig. 1. Computed tomographic scan of the patient.

## Discussion

Ureteral calculi is one the most prevalent diseases in urology. Ureteral avulsion is a rare, but horrific complication of endoscopic stone removal having multiple possible etiologies. Awareness and avoidance of this rare complication depend on identifying responsible mechanisms.

Only a few case reports of endoscopic management of ureteral avulsion have been previously reported. This is the second reported case report of the “mucosal ureteral avulsion”, a new terminology in urology.

Rouhani et al. reported is the first effective management of ureteral mucosal avulsion and use of Memokath ureteral stent in 2017. They used semirigid ureteroscopy and laser lithotripsy, similar to our case, on withdrawal of the ureteroscope, a ureteral mucosa was avulsed from the L3 level to the vesicoureteral junction. They discussed a variety of options for management of this injury, and finally the patient selected endourologic approach (Rendezvous procedure), which was successfully performed. However, after ten months, the patient developed a ureteral stricture, which was managed by Memokath ureteral stent.<sup>4</sup>

Since both mucosal avulsion and its endourological management are new topic in urology, it would be challengeable at the first steps. Firstly, it should be known that this method is new and should not use as routine clinical approach. Secondly, the most common consequence of this method would be ureteral stricture, so we should warn patient about it and have a close follow-up. Further case series and randomized clinical trials would be necessary to make comparison between treatment options in mucosal ureteral avulsion, however, due to its low incidence, only multicenter studies and meta-analysis could reach this aim.

## Conclusions

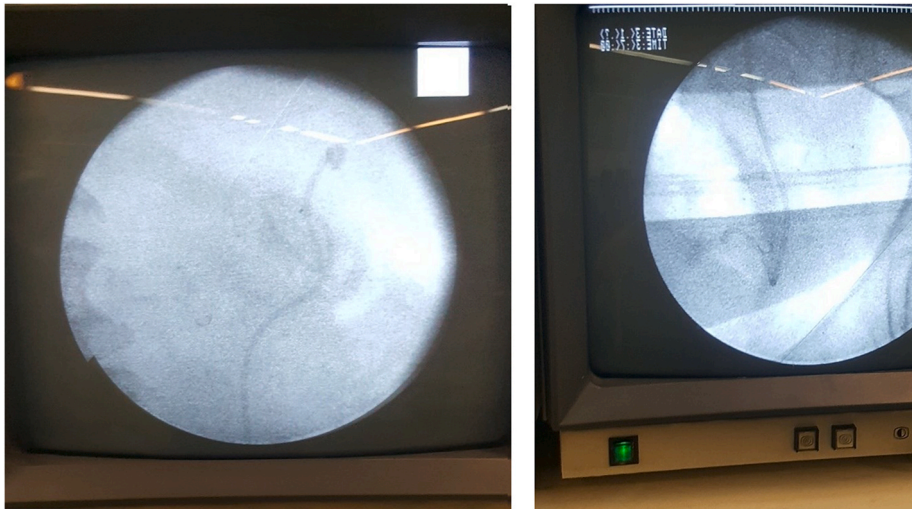
Mucosal Ureteral avulsion, could be managed by endourology techniques in selected patients. However, pros and cons of this treatment option should be carefully described to patients and long term follow-up would be necessary in these patients.

## Ethical statements

This research has been done under the Tehran University of medical sciences committee.



Fig. 2. Mucosal vaulted segment of ureter.



**Fig. 3.** Fluoroscopic view of proximal(A) and distal(B) ends of double J stent after insertion.

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#### Declaration of competing interest

There is no conflicts of interest.

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