Endoscopic realignment of completely transected ureter leading to ureterocutaneous fistula- A case report

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ABSTRACT

Ureters are retroperitoneal structures and are well protected in the abdominal cavity. Reported incidence of ureteric injuries is 0.5%-10% and iatrogenic factor is the most predominant. Ureteric discontinuity following injury has been traditionally treated by open surgery. With the advent of improved Endoscopic instruments and fiber optics it is possible to stent these lesion percutaneously or retrogradely. We describe a retrograde endoscopic approach to re-establish ureter integrity successfully in a case of fire arm injury resulting in complete transection of ureter and subsequently ureterocutaneous fistula.

We illustrated usefulness of Endoscopic approach for the management of ureteric injuries as an alternative to traditional approach.

Key words- Transection- stent –urinoma-retrograde-latrogenic-ureter injury
INTRODUCTION

Ureters are retroperitoneal structures and are well protected in the abdominal cavity by dorsal muscles, vertebral column, abdominal muscles laterally and anteriorly. Moreover, the ureters are very small, movable and flexible structures. However, despite of its well protection, ureters are prone to injury.

Ureter injury may be partial or complete and may be the result of blunt, penetrating or iatrogenic trauma.

Incidence of ureteric injury is 0.5% to 10% and iatrogenic factor is most predominant because of its anatomical location in the abdominal cavity. Gynecological procedures account for 50%-75% of iatrogenic ureteric injuries.

General surgical procedures like abdominoperineal resection and endoscopic urological procedures are also contributing to ureteric injuries. Among the rare causes are spontaneous ureter rupture following ureteric obstruction, seat belt injury in pediatric population and fire arm injury. Obesity, cancer, hemorrhage, endometriosis, adhesions and an enlarged uterus are important risk factors for ureteric injuries during any pelvic, abdominal or retroperitoneal surgery.

Traditional surgical repair of completely transected ureter is considered routine practice but endoscopic realignment of completely transected ureter is innovative and difficult task which was considered worth reportable.

CASE REPORT

Twenty five years old male with midline abdominal scar mark, left colostomy, a wound with watery discharge over left iliac crest and having poor general health was referred from General Surgical Department.

Figure 1: Ureterocutaneous fistula with ileostomy bag over left iliac crest
One month before referral, this patient received gunshot injury in his home country (Djibouti). As a consequence he developed multiple intestinal perforations, gastric perforation, mesenteric tear comminuted fracture of left iliac bone and fracture of transverse process of 5th lumbar vertebra. He was operated same day (in Somalia). Left colostomy was performed with repair of small bowel, gastric perforation and mesenteric tear. Despite surgical measures, patient condition continued deteriorating and watery discharge started coming out from bullet tract over the crest of left iliac bone on 10th post-operative day. Ileostomy bag was attached and patient was advised to consult urologist. The patient was brought in UAE and admitted in GMC Hospital for further management.

As patient was received, he was anemic: Hb 8gm/dl, febrile and in poor general health. Two packed red blood cells transfused and his hemoglobin has raised up to 13.2g/dl. High protein diet was advised and antibiotics and ½v fluid started.

Oral and ½v contrast C-T Scan was performed. It revealed left ureteric complete transection with urinoma formation between left Psoas and left iliac muscles with fistulous tract extending through the fractured iliac bone to the overlying skin. Distended stomach and small bowel was also observed. Air loculi within the left renal collecting system and urinary bladder were also seen.
With the diagnosis of complete ureteric transection and urinoma at the level of L4-L5, multiple treatment options both open and endoscopic were considered. Even worse options auto-transplant and nephrectomy were also under consideration. Endoscopic realignment was our preferred treatment option because the increased morbidity and complications were associated with open surgical procedures due to previous surgery just one month before.

Patient was planned for surgery and informed consent was taken. We started with cystoscopy and sensor straight tip nitinol wire with hydrophilic tip was introduced into the
left ureter orifice under fluoroscope control. The floppy tip was positioned in the urinoma. Then rigid ureteroscope was introduced over the guidewire into the ureter. Just 7cm proximal to vesicoureteric junction, ureter was stenosed however we continued to push ureteroscope under vision and over the guidewire very slowly and carefully until we reach the urinoma where we found curled guide wire. Here we found many soft tissues false passages and started searching the true passage by sensor floppy tip. Fortunately one passage admitted the sensor tip to pass through and it was found curled up in the collecting system. For confirmation ureteric catheter (6 fr) was inserted over the guide wire and retrograde urography was performed monitored by fluoroscope. Renal collecting system was outlined with contrast material. After confirmation of realignment then we inserted the D-J Stent. However it took 2½ hours and once we pulled the guide wire during this procedure.

The post-operative period was uneventful. Patient was looking active and healthy on 1st post operative day. The urinary discharge started decreasing immediately after surgery and patient was dry on 2nd post operative day. Patient was discharged on 3rd post operative day with advice of follow-up in urology OPD on monthly basis.

DISCUSSIONS
Ureteric discontinuity following injury has been traditionally treated by open surgery. With the advent of improved endoscopic instruments and fiber optics, it is possible to stent these lesions retrograde or percutaneous. The standard methods for the management of ureteric dehiscence or fistula by cystoscopic retrograde or percutaneous antegrade stent insertion have a technical success rate of 10%-40% and 90% respectively.

The patient arrived in our Department with watery discharge over left iliac crest which after further work up was clarified to be a completely transected ureter with urinoma at L4-L5 level and ureterocutaneous fistula. Different treatment options like retrograde cystoscopy, ureteroscopy and stenting under vision, antegrade percutaneous stenting, ureteroureterostomy, tranureteroureterostomy, ileal substitution of the ureter, autotransplant and even worst option nephrectomy were considered. Because this patient...
underwent laparotomy one month before so traditional surgical options were hazardous to practise. In this case we tried retrograde cystoscopy and ureteroscopy and did stenting of transected ureter under vision through urinoma successfully.

To our knowledge only five cases of endoscopic management of ureteric injuries have been reported in literature. A similar technique, retrograde cystoscopy and ureteroscopy has been successfully employed in the management of distal ureteric fistula by De Baere et al. in 1995 and Beaghler MA et al. in 199710,11, Postoak etal in 1997 managed ureteric transection secondary to gunshot wound by combining percutaneous antegrade and cystoscopic retrograde ureteral stent placement12. Gray et al. in 1992 and Hugh et al. in 2004 described an intraurinoma rendezvous approach combining percutaneous antegrade-transconduit retrograde technique of stent insertion to reestablish ureteric integrity in case of recurrent ovarian carcinoma (ureterocolic and ureterovaginal fistulae) and operated bladder cancer patients respectively9,13.

It is important to mention here that all these were complicated cases with different mechanism of injury and it was also hazardous to operate traditionally due to previous surgery. However all these were managed endoscopically depending upon the expertise and facility available in the institution.

Ureteric injury is associated with serious and significant morbidity if it remains undetected and untreated. That may result in urosepsis, fistula formation, increased hospital stay, compromise of original surgical outcome, potential loss of renal function, significant deterioration of patient quality of life and psychological disturbance3,14. Our case was also neglected and overlooked case of ureteric injury. His general health was poor and he was anemic also, but after successful stenting post-operative recovery was marvelous and rapid.

We would like to emphasize that appropriate and timely management of these injuries is very important to decrease associated morbidity. We will also illustrate that this procedure offers an alternative approach particularly in patients where traditional surgery is hazardous and associated with complications.

**CONCLUSION**

Ureteric injury has multivariate etiology but iatrogenic factor is most predominant. Ureteric injury is associated with serious and significant morbidity if not timely and properly managed. Ureteric discontinuity has been traditionally managed by open surgery but endoscopic realignment of completely transected ureter is difficult and innovative and is associated with rapid and prompt recovery. It is an alternative to traditional approach particularly in patients where traditional surgery is hazardous and associated with complications.

**REFERENCES**