

Immediate Reconstruction of Ureter Avulsion with Ileal Ureter: Case Report

Üreter Avülsiyonunun İleal Üreter ile Aynı Seansta Rekonstrüksiyonu

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ABSTRACT Ureteral avulsion is an infrequent but a catastrophic complication of ureteroscopic surgeries. In this case report, we present a 42 years old male patient who was performed an ileal ureteral reconstruction for the complication of total ureteral avulsion which occurred during ureteroscopic stone removal. There are some debates about early and late reconstruction of ureteral avulsion. Authors recommending early reconstruction indicate lower rates of complication with early reconstruction. Similar to debates on timing of reconstruction, there are also debates about the alternative treatment opportunities for ureteral avulsion. Early reconstruction with ileal replacement is one of these techniques and may be an organ sparing surgery for severe ureteral avulsion. Complexity of this technique and possible postoperative complications are other reasons for discussion. In this case report, we present a patient with total ureteral avulsion who were treated by immediate ileal reconstruction with two years follow-up.

Key Words: Ureter, ureteroscopy, ileum, traumatology

ÖZET Üreter avülsiyonu, üreteroskopik girişimler sırasında görülebilen nadir, ancak katastrofik sonuçları olabilen bir komplikasyondur. Bu olgu sunumunda, üreter taşına yönelik üreteroskopik girişim sırasında oluşan iatrojenik total üreter avülsiyonu ve erken dönem ileal üreteral rekonstrüksiyon uygulanmış 42 yaşında bir erkek hasta bildirilmiştir. Üreter avülsiyonu sonrası erken ve geç dönem rekonstrüksiyon hakkında farklı görüşler bildirilmektedir. Erken dönem rekonstrüksiyonu öneren görüşler, bu sayede komplikasyon oranlarının daha düşük olduğunu savunmaktadır. Bu tedavinin zamanlaması konusunda olduğu gibi, olası alternatif tedavi yöntemleri hakkında da farklı görüşler bulunmaktadır. Bu yöntemler arasında erken dönem ileal replasman bir teknik olarak kullanılabilir ve özellikle tedavisi zor, ciddi üreter avülsiyonlarında organ koruyucu bir yöntem olabilir. Bu tekniğin zorluğu ve postoperatif dönemde yaratabileceği komplikasyonlar ise ayrı bir tartışma konusu yaratmaktadır. Bu olgu sunumumuzda total avülsiyon sonrası erken dönemde uygulanan ileal üreter rekonstrüksiyon ve iki sene sonundaki klinik seyir bildirilmektedir.

Anahtar Kelimeler: Üreter, üreteroskopi, ileum, travmatoloji

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Ureteral traumas became more frequent with the evolution of endourological surgeries in all around the world. Total ureteral avulsion is the most devastating complication of ureteroscopy that can lead to organ loss. Surgeons must be aware of this possible complication and must have idea how to deal with. Here we report a patient, who had total ureteral avulsion during ureteroscopy and treated with ileal ureteral reconstruction.

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CASE REPORT

A 42 years old male patient was admitted to outpatient clinic with complaint of left flank pain. According to radiological evaluation, a 9 mm middle ureter stone with grade I-II hydronephrosis was identified. The contralateral kidney was normal. The patient received medical expulsive therapy for 2 weeks. At the end of the second week, as the patient had the same complaints with the stone at the same location, it was decided to perform a left sided semirigid ureteroscopy. Under spinal anesthesia, we performed ureteroscopy and the procedure was complicated by a ureteropelvic junction avulsion. As soon as the complication was recognized, we decided to repair the defect with ileal substitution with left pararectal incision. Left renal pelvis was liberalized easily from peripheral tissues. Then the excision area of ileum, which was 12 cm proximal to the ileo-caecal valve, was marked by sutures and a 20 cm ileal segment proximally was divided. The proximal ileal segment had been anastomosed to proximal ureteric stump in a simple end-to-end technique and the distal ileal segment was intussuscepted into the native bladder over a double J stent. We placed a drain near the area of the proximal ureteral implant, and another to the pelvis. The liquid diet was started in postoperative second day. The proximal drain and the pelvic drain were removed in postoperative third and fourth days, respectively. Urinary catheter was removed in postoperative seventh day and the patient was discharged. Three days after discharge, the patient admitted to hospital with serous drainage. The wound was opened for 1 cm. and the collection was drained. The incision was closed in 10 days with secondary healing. The ureteral stent were removed postoperative fourth week. In postoperative second month follow-up, the kidney was totally normal and there was no hydronephrosis. The blood creatinine level was similar with preoperative value (0.92 ng/dl, 0.96 ng/dl, respectively) and the patient did not have any metabolic disorders. The intravenous pyelography at the sixth month of surgery was normal (Figure 1). Patient had normally functioning kidney with



FIGURE 1: Intravenous pyelography of patient at postoperative sixth month.

normal renal paranchyma at the postoperative second year of the surgery.

DISCUSSION

Ureteral avulsion is a rare but devastating complication of endoscopic stone treatment. It was first reported by Hart et al. after a difficult ureteral stone manipulation with Dormia basket in 1967.¹ In corresponding years, with the bulky use of minimally invasive techniques in urology and gynecology, the incidence of ureteric injury has increased.^{2,3} In a meta-analysis in 2006, the incidence of ureteral avulsion was reported as 0.28% among 6654 patients.⁴ Replacement or repair of long defect or absent segments of the ureter, especially of the proximal ureter, poses a particularly difficult surgical challenge. As every case has a special consideration, there is no exact recommendation on the treatment of long upper ureteral lesions. In proximal ureteral injuries challenging treatment options such as ileal interposition or auto-transplantation are required.^{5,6} The use of small bowel for ureteric replacement was first described by Shoemaker in 1906 and popularized by Goodwin et al.^{7,8} By this technique, ileal segment substitution has become a valuable procedure in reconstructive urology. It is technically feasible sur-

gery that can be performed in any patient requiring aggressive ureteral reconstruction despite a normal contralateral kidney. As such, it is a better alternative than nephrectomy.

In order to avoid this complication, caution in every step of ureteroscopy has the main importance. As this complication occurs with harsh tissue manipulations, urologists must avoid multiple endoscopic passages and be gentle during the surgery. Using safety guide was advised for the safety of the procedure. Pardalidis et al. proposed using ureteral access sheath as a solution for safe and quick ureteroscopic stone removal for impacted ureteral stones. They concluded that ureteroscopy might be more feasible, quick and safe procedure with the use of access sheath.⁹ Although these manipulations decrease the incidence of ureteral avulsion, urologists must know how to deal with this complication once it happens.

In this case report, we introduced a ureteral avulsion that was treated by ileal replacement for ureteral reconstruction. This procedure is a great opportunity for long segment ureteral injuries that has many advantages for salvaging a functioning kidney without major complications. It can avoid the patient having long term urinary diversion with external devices and nephrectomy of a functioning kidney. The success rate of the procedure have been reported to be 81% - 100% with acceptable complication rates.^{10,11} The main complications are; metabolic acidosis, anastomotic stenosis, mucous plugging, colocutaneous fistula, urine leak and worsening renal functions. But the incidence of these complications were <10% in the literature. The main disadvantage of ileal replacement surgery is selecting the patient suitable for this technique. It is contraindicated in the presence of renal insufficiency usually defined as a serum creatinine level greater than 2 mg/dL.¹² Additionally, contraindications are bladder dysfunction, radiation enteritis or inflammatory bowel disease. This procedure may need bowel preparation, which is impossible when it is performed simultaneously with the complicating surgery. But it was shown that, both mechanical and antibiotal bowel preparations do not always decrease the risk of complica-

tions in minor intestinal surgeries.¹³ Only perioperative intravenous antibiotics appear to be the most important means of preventing infectious complications of intestinal surgery.

The timing of surgery is also debatable. Some authors advocate the early reconstruction while the others recommend late reconstruction of ureteral defect. The advocates of early treatment suggest that treatment of ureteric injuries at the time of surgery was associated with less morbidity as the tissues are typically in their best condition. Patients in whom the diagnosis was delayed had many complications like; urinary leakage, intestinal adhesions and wound infection. Hospital stay was significantly longer in delayed surgery patients (4.8 days – 10.1 days, respectively).¹¹ Immediate repair allows better results and fewer complications than after a delay.

Alternative treatment opportunity for this case was autotransplantation. Especially in patients with pre-existing renal failure or a solitary kidney, autotransplantation offers the only option besides immediate nephrectomy.¹⁴ The morbidity of this procedure, however, may be significant and unacceptable, especially in those with a normal contralateral kidney. Most important complication is vascular thrombosis. Several factors may be limiting and preclude autotransplantation, including the length of the renal vessels and severe fibrosis resulting in poor blood supply of the ureter or renal pelvis. Beside these, a team with high experience is required for a successful autotransplantation.

In our case we preferred to perform ileal ureteral substitution. We preferred early intervention because the patient was young with no history of radiation, bowel disorder and renal dysfunction. Beside this the tissues were suitable for reconstructive surgery. The reconstruction time was 150 minutes, which was not compulsive for the patient. During the postoperative early period, we did not observe any metabolic disorder and the patient was able to be discharge in postoperative seventh day. The only complication was seroma, which was also resolved by conservative treatment. At the end of

second year follow-up, our patient had anatomically and biochemically normal kidney without any anastomosis stricture.

Ileal ureteral substitution surgery is a safe and reliable option with favorable results and accept-

able complication rates. A careful lifelong follow-up is critical for the success of that procedure. This technique can be a good opportunity for ureteral avulsion reconstruction which is always challenging case for urologists.

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