

KLINIKINIS ATVEJIS

Successful treatment of upper ureteral injury using renal autotransplantation

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Key words: injury of the upper ureter; renal autotransplantation.

Summary. *Introduction.* Ureteral injuries are uncommon. Upper ureteral defect more than 7–8 cm in length is a challenge for urologists, requiring experience and several steps in its management. We report a case of iatrogenic upper urinary tract injury and successful treatment of 8-cm ureteral defect using autotransplantation of the kidney.

Case report. A male patient underwent surgery due to retroperitoneal tumor. Iatrogenic ureteral injury was recognized 18 days after operation. Three-step management of urinary tract injury was performed. The first step included minimally invasive recovery of the urine flow and treatment of infection. The second step was unsuccessful renal descensus and new formation ureteropyeloanastomosis because of difficulties of kidney mobilization caused by previous surgery. The third step included a successful autotransplantation of the kidney and complete reconstruction of the urinary tract.

Conclusions. Autotransplantation can be successfully used for the management of long upper ureteral injury in referral urological centers.

Introduction

Ureteral injuries are uncommon. They occur after external violence (as a consequence of penetrating and blunt traumas) and their frequency is less than 1–4% (1). Ureteral injuries can occur after many surgical procedures, but they largely result from those performed in the pelvis and retroperitoneum area. In one review of 13 series of ureteral injuries, hysterectomy was the major cause (54%) followed by colorectal surgery (14%) (2). Immediate recognition of injury is very important because it allows one-step management of defect and very often is followed by minimally invasive procedures. Delayed recognition of injury requires the treatment of several steps as well as high experience of urologists. Replacement or repair of long defect or absent segments of the ureter, especially of the proximal ureter, poses a particularly difficult surgical challenge (3). There are no any strict recommendations on the treatment of long upper ureteral lesions; every case is usually unique. A case of iatrogenic injury of the upper ureter with delayed recognition followed by a three-step management, which resulted in autotransplantation of the kidney, is presented in this article.

Case report. A 49-year-old male patient underwent surgery due to a large (10×12 cm) left retroperitoneal tumor (Fig. 1). No signs of ureter injury were observed during the operation and early post-operative period. The patient was discharged from hospital two weeks after operation, and three days thereafter, he returned to the Department of Surgery of our hospital with complains of nausea, bile vomiting, and signs of ileus. Computer tomography was performed, and a large amount of liquid was detected near the left kidney (Fig. 2). Percutaneous drainage was performed, and the liquid was analyzed for urine. Creatinine level detected in the liquid was 1160 $\mu\text{mol/L}$. There was no doubt about the case of urinary tract injury and that is why a several step treatment strategy was planned. Firstly, percutaneous nephrostomy was performed to assure a complete urine flow from the kidney. Urinary tract infection was treated according to antibiotic-gram from urinary culture. Because of recurrent infection, the exact location of urinary tract injury was investigated 10 weeks after nephrostomy. Investigation was started with antegrade pyelography. It resulted in detection of hydronephrosis with no signs of contrast media in the upper ureter (Fig. 3).



Fig. 1. Left retroperitoneal tumor (10×12 cm)

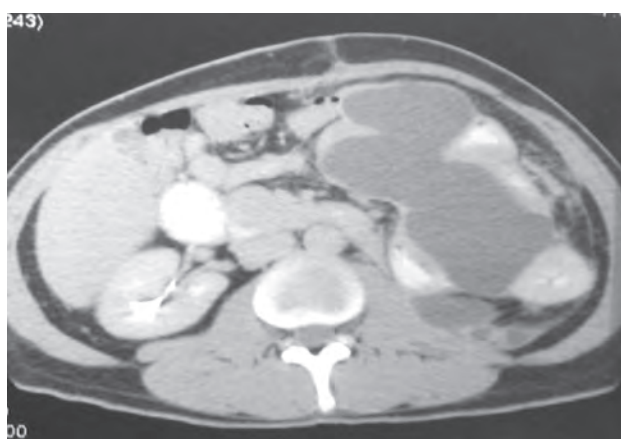


Fig. 2. Liquid in the abdominal cavity

Retrograde ureterography was performed thereafter, and upper ureteral defect 7–8 cm in length was detected after comparing data from two radiological investigations. The second step of treatment was renal descensus and ureteropyeloanastomosis. Surgery was performed on November 18, 2006. The kidney was mobilized as much as possible but due to anatomical reasons (short renal blood vessels), hard adhesions and inflammation process after previous operation, safe ureteropyelojunction was impossible. Autotransplantation was chosen as a third step of management. It was performed on January 21, 2007, 7 months after the first surgery. At lumbotomy position, previous incision was revised, and the kidney was completely mobilized. Renal artery and vein were dissected at the most possible length. Later another left inguinal incision was performed. The extraperitoneal space,



Fig. 3. Antegrade pyelography

Hydronephrosis with no contrast media in upper ureter.

external iliac vessels, and lower part of the ureter were mobilized. The kidney was removed, and its perfusion with the Euro-Collin's solution was performed. Renal vein and artery were connected with external iliac ones, and blood supply to the kidney was recovered within 30 min. Reconstruction of the urinary tract was completed by performing ureteropyelojunction. For safe urine flow from the transplanted kidney, double J stent was left in the urinary tract. Two weeks after operation, the patient was discharged from the department with good state of autotransplanted kidney (Fig. 4) and urinary tract function (Fig. 5). One year after surgery, no signs of renal function or urine outflow abnormalities were observed.

Discussion

Management of long ureteral injury is always challenging for urologists. There are no data available how often it occurs in a general population, but most often it is associated with pelvic or retroperitoneal surgery. Other reasons of such pathology could be malignancy of the upper urinary tract (transitional cell carcinoma), retroperitoneal fibrosis, or radiation (1). Immediate recognition of ureteral injury occurs in up to 34% of cases, and in majority of cases, it can be managed during the surgery. Most lesions of the ure-

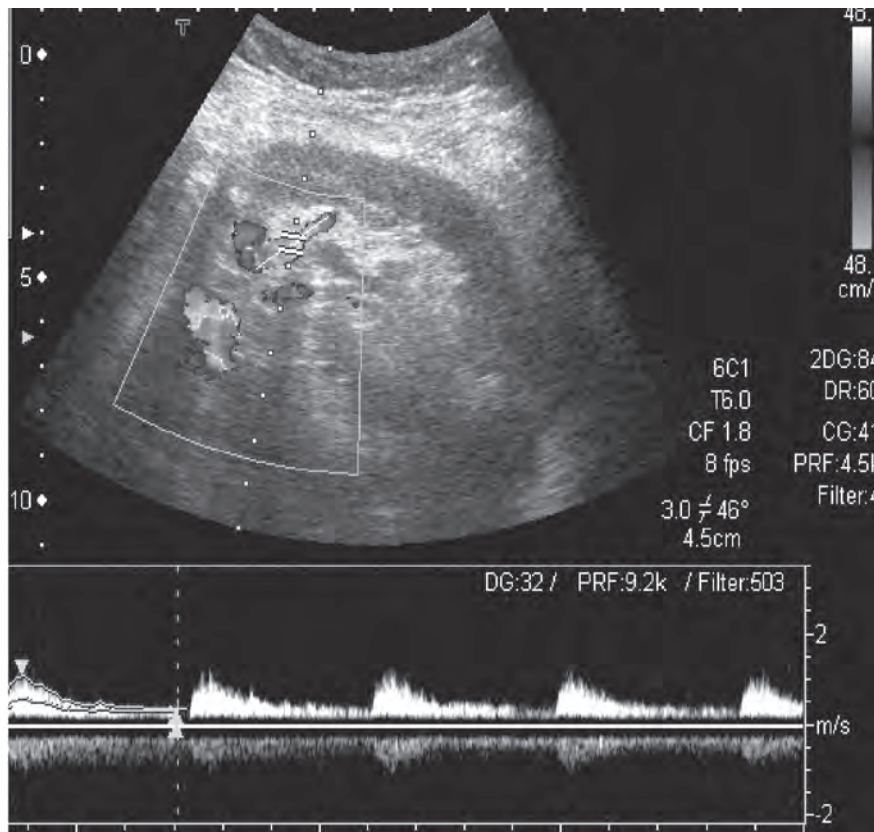


Fig. 4. Doppler sonography two weeks after autotransplantation
Normal renal vein and artery blood supply.

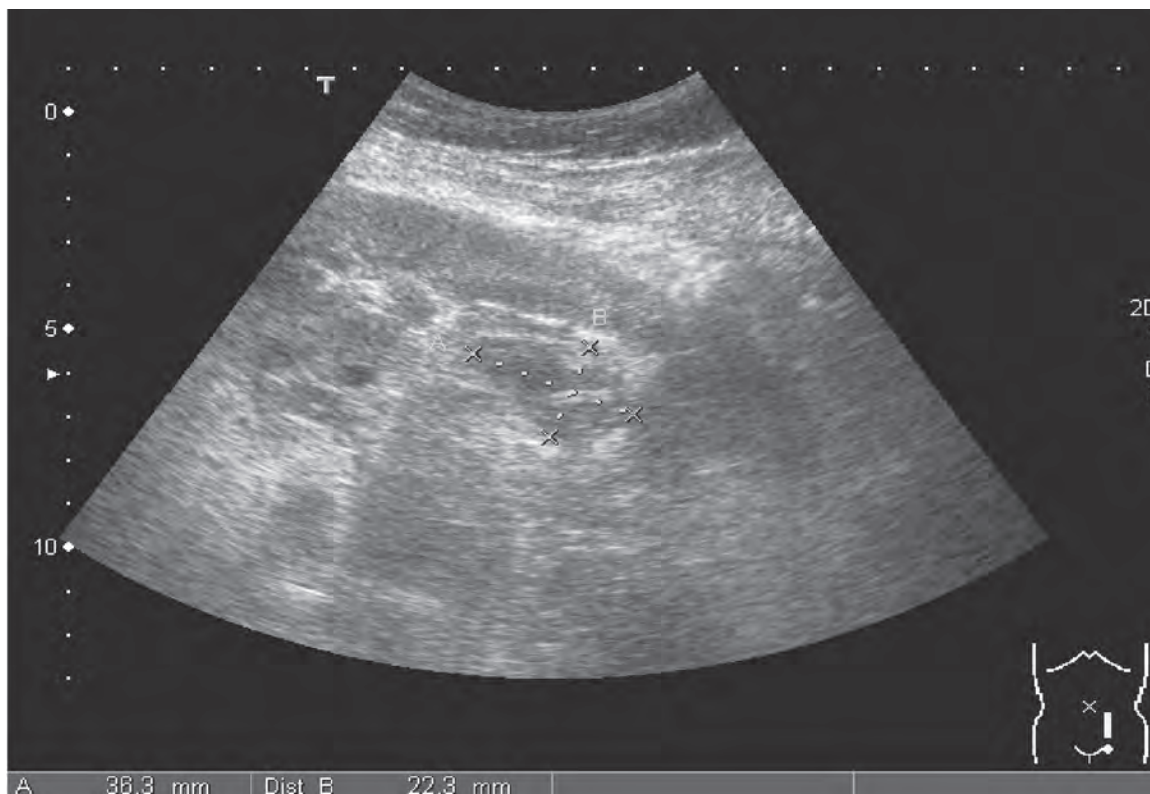


Fig. 5. Sonography two weeks after autotransplantation
Slightly dilated renal pelvis with a visible proximal part of double J stent.

ter (60–70% of cases) are detected during the late period (from 3 to 33 days) after injury (4) and require several treatment steps. The recovery of proper urine outflow using minimally invasive procedures and exact detection of place and length of lesion is recommended as the first step. In cases of prolonged defect of the upper ureter (8–10 cm or more), reconstructive surgery is needed. Renal descensus was firstly described by Popescu in 1964, and that technique is the first choice if the length of a ureteral lesion is up to 8 cm. In presented case during such operation, some difficulties were met. The first one can be easily suspected – inflammation process and adhesions after prolonged urinoma. But in this case, the failure of procedure was determined by anatomy of renal vessels. Several other modalities of surgery are proposed for such long ureteral defect: creation of ureteral conduit from the ileum, buccal mucosa patch graft, or

autotransplantation. All these procedures have not been performed at our institution before. Buccal mucosa patch has been presented by limited number of cases (5). Ileal ureteral substitution is a procedure similar to ileal patch formation after radical cystectomy. The rate of complications and functional results are acceptable (6). Our decision was mostly influenced by experience on renal transplantation we have and possibilities to reconstruct the urinary tract using native structures. This procedure of management of large ureteral defect is not acceptable if there is no experience on vascular surgery, explantation and transplantation of kidney.

Conclusion

In case of long ureteral lesion, autotransplantation can be used as the final step of management leading to the most acceptable outcomes.

Sėkmingas viršutinės šlapimtakio dalies pažeidimo gydymas panaudojant inksto autotransplantaciją

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Raktažodžiai: viršutinės šlapimtakio dalies pažeidimas, inksto autotransplantacija.

Santrauka. Šlapimtakio pažeidimai yra nedažni. Ilgesnis nei 7–8 cm šlapimtakio pažeidimas, kuriam gydyti prireikia kelių gydymo etapų, visada yra iššūkis urologams. Šiame straipsnyje aprašomas klinikinis atvejis: 8 cm ilgio viršutinės dalies šlapimtakio pažeidimas, susijęs su prieš tai taikytu gydymu, sėkmingai išgydytas panaudojant inksto autotransplantaciją.

Klinikinis atvejis. Vyras buvo operuotas nustačius retroperitoninio tarpo naviką. Su chirurginiu gydymu susijęs šlapimtakio pažeidimas nustatytas praėjus 18 parų po operacijos. Pažeidimo gydymas taikytas trimis etapais. Per pirmąjį etapą minimaliais invaziniais metodais buvo atkurtas šlapimo nutekėjimas iš inksto bei gydyta šlapimo takų infekcija. Antrasis etapas: inksto nuleidimas, siekiant suformuoti naują šlapimtakio–geldelės jungtį, buvo nesėkmingas dėl sunkios inksto mobilizacijos, kuriai įtakos turėjo buvusi operacija. Trečiasis etapas: sėkminga inksto autotransplantacija ir visiška šlapimo takų vientisumo rekonstrukcija.

Išvados. Specializuotuose urologijos centruose autotransplantacija gali būti sėkmingai naudojama esant viršutinės šlapimtakio dalies pažeidimui.

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