

Iatrogenic ureteric injury : A real medicolegal dilemma

Sataa Sallami

Department of Urology - La Rabta Hospital, Tunis-Tunisia
Tunis Medical School, Tunis El Manar University

S. Sallami

Lésion urétérale iatrogène: Un vrai dilemme médico-légal

LA TUNISIE MEDICALE - 2012 ; Vol 90 (n°11) : 819 - 823

R É S U M É

Prérequis : Les lésions iatrogènes urétérales ne sont pas aussi rares et peuvent avoir des conséquences médico-légales graves.

But : Rapporter un cas de lésion urétérale iatrogène, secondaire à une urétérolyse et traités par substitution urétéro-ileoplasty non modélisés.

Observation : Un homme de 70 ans, qui a présenté compression urétérale extrinsèque due à la fibrose rétropéritonéale idiopathique, a subi une urétérolyse à ciel ouvert. En peropératoire, l'uretère a été lésé et les dégâts ont été tellement importants que le chirurgien a décidé d'effectuer une substitution iléale. Les suites opératoires étaient simples. Plusieurs années après, le rein ipsilatéral était lithiasique, hydronéphrotique et peu fonctionnel avec un gros calcul au niveau du tube iléal. Une néphrourétérectomie emportant le greffon iléal a été faite.

Conclusion : À travers cette observation, nous évaluons les décisions per opératoires devant une complication iatrogène et les conséquences médico-légales.

S. Sallami

Iatrogenic ureteric injury: A real medicolegal dilemma

LA TUNISIE MEDICALE - 2012 ; Vol 90 (n°11) : 819 - 823

S U M M A R Y

Background: Iatrogenic ureteral injuries are not so rare and may have serious medicolegal repercussions.

Aim: To report a case of iatrogenic ureteral injury, secondary to ureterolysis and treated by substitutive non-modeled uretero-ileoplasty.

Case report: A 70-year-old man, who presented extrinsic ureteral compression due to idiopathic retroperitoneal fibrosis, underwent ureterolysis. Peroperatively, the ureter was injured and the damage was so important that the surgeon decided and performed a substitutive non-modeled uretero-ileoplasty. Immediate postoperative course was normal.

Many years after, he developed hydronephrotic poor functioning kidney with multiple renal lithiasis and a large ileal tube stone. He underwent a nephroureterectomy with ileal tube excision.

Conclusion: Through this observation, we evaluate the operator peroperative decisions and the medicolegal consequences.

M o t s - c l é s

Fibrose rétropéritonéale idiopathique, Uretère, Iléon, Rétrécissement, Urétérolyse, Lithiase, Néphrectomie.

Key - words

Idiopathic retroperitoneal fibrosis, ureter, ileum, ureteral stricture, ureterolysis, stone, nephrectomy.

Idiopathic retroperitoneal fibrosis (IRF) is a severe disease that may affect the ureters, causing renal insufficiency (1). Although optimal treatment is far from being established, surgical treatment is indicated in case of medical treatment failure or complications. In severe hydronephrosis due to ureteric extrinsic compression, ureterolysis is a common therapeutic option (2). Most cases of iatrogenic ureteral injuries are treated endoscopically, but some necessitates ureteral substitution or ileoplasty (2). This technique is well standardised, however complications may occur. Most indications concern ureteral necrosis secondary to ureteral ischemia. This necrosis may be secondary to open urologic surgery, gynaecologic, digestive and even endoscopic surgery of the upper urinary tract (2).

Herein we present a case of iatrogenic ureteral injury, secondary to ureterolysis, treated by substitutive non-modeled uretero-ileoplasty with long term complications. Also, we point on medicolegal repercussions of such indications. In order to prevent these complications, it is adequate to evaluate their causes. The judgment criteria were professional standards and required care.

CASE REPORT

A 70-year-old man presented to our clinics for right lumbar pain. He was operated 19 years ago (1991) for right ureteral obstruction and renal dilatation secondary to extrinsic compression resulting from IRF. According to his urologist, the patient had IRF causing right renal dilatation but without renal insufficiency. Biopsy results of the retroperitoneum were benign, with evidence of dense fibrous tissue. Because of failure of medical treatment, surgery was decided. He was planned to undergo ureterolysis through a median incision. The ureterolysis was very difficult and complicated by a stripping of about 10 cm of the proximal ureter. Lesions were irreparable and the urologist decided to perform ileal ureteroplasty. The ureter was transected at healthy well vascularised segments. The intestinal substitute is derived from the terminal ileum measuring 10 cm in length with preservation of blood supply. A latero-terminal-anastomosis was made between the cephalic end of the ileal tube and the spatulated proximal ureter using interrupted 4/0 absorbable sutures and stented using a double J stent 10 F (Figure 1). The distal end of the ileal tube is then anastomosed to the distal ureter without any nonrefluxing procedure. Postoperative course was unremarkable. Ureteral stent was removed four weeks later. Follow-up of this first intervention was only 3 months. Since that time, the patient didn't consult his operator or another urologist. He didn't have any radiological investigation. He has been free of symptoms for about 15 years.

Actually, he presented for vague right-sided flank pain. On examination, he appeared healthy. He was afebrile with a blood pressure of 150/90 and a pulse of 64. Abdominal palpation revealed tenderness in the right lumbar fossa but without evidence of abdominal masses.

Renal ultrasound showed a right hydronephrosis with normal left kidney. Intravenous urography (IVU) demonstrated renal

hydronephrosis with multiple lower calyceal stones and a large ileal stone (Figure 2 and 3). A preoperative MAG 3 renal scan documented obstruction of the right kidney. The patient was also noted to have differential function of 85% versus 15%, respectively. He underwent a nephroureterectomy through a large median incision. Examination of specimen concluded to multi-lithiasic, hypotrophic kidney with a large stone in the ileal tube (Figure 4 and 5). The two anastomoses were stenotic. Postoperative course was unremarkable.

Figure 1: Schema of the right substitutive non-modeled uretero-ileoplasty.

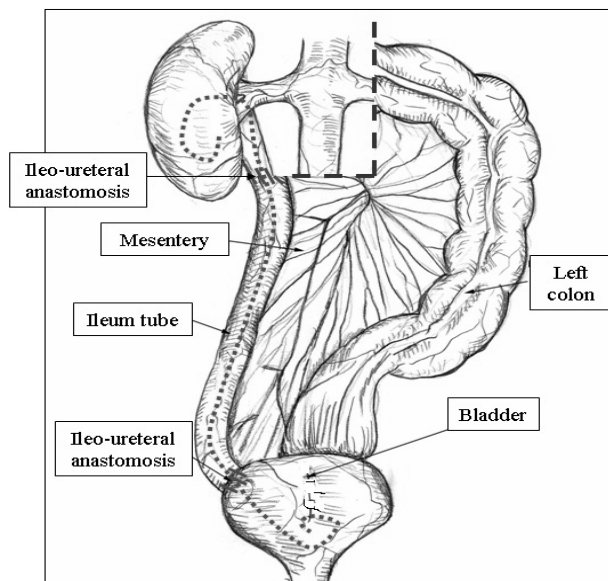


Figure 2: KUB film: multiple stones on the right kidney area and a large stone below.



Figure 3: Intravenous urography: right renal hydronephrosis with multiple lower calyceal stones and a large ileal stone.



Figure 4 and 5: Specimen: hypotrophic kidney with a large stone in the ileal tube.



Figure 4 and 5: Specimen: hypotrophic kidney with a large stone in the ileal tube.



DISCUSSION

IRF is an uncommon disease, characterized by a non neoplastic periaortic mass of variable thickness that envelops the aorta and the inferior vena cava between the renal hilar and the sacral promontory and extends laterally to entrap ureters (3). The exact cause of IRF remains unknown. Clinical presentation is often non specific.

Excretory urography and retrograde urography were the primary diagnostic modalities for this condition. Classically, the IVU shows the triad of medial deviation of the ureters at the L3 to L4 bevels with extrinsic compression of the ureters and hydronephrosis (4).

Actually, CT Scan has supplanted other imaging modalities as the radiological examination of choice in patients with suspected IRF (5). In most patients, the plaque appears as a centrally located soft-tissue mass of variable thickness extending from the renal hilum to the common iliac vessels surrounding the aorta and vena cava. However, in up to 30% of cases, the CT scan may be non diagnostic (6).

Although IRF is an uncommon cause of ureteral obstruction,

hydronephrosis leading to progressive renal failure is the most frequent and severe complication of this condition, being present at diagnosis in about 75% of patients (3). The fibrotic mass may progress until completely blocking the blood vessels and the ureters involved by the process (1), encase and compress the ureters leading to hydronephrosis. It is usually unilateral and involves the lower one-third of the ureter.

Thus, the aim of the initial management should be to restore the patency of the urinary tract and to improve renal function. Both surgical and medical managements have been used (1).

Ureteral stenting and ureterolysis are often used to relieve ureteral obstruction. Steroids may also improve obstruction and the renal function (7). Azathioprine (8), cyclophosphamide (9), methotrexate, ciclosporin, mycophenolate mofetil (10) and tamoxifen (11) have been used in association with steroids. Conventionally ureterolysis with repositioning the ureters laterally, "intraperitonealizing" them or performing an omental wrap has been the gold standard in surgical management (4). It may be performed either by open surgery or by laparoscopy. This procedure is risky and may cause significant ureteral damage (12).

Long-segment defects of the ureter may result from various pathological disorders: chronic inflammatory disease (tuberculosis or bilharziasis), IRF leading to narrowing and ischemic injury to a major segment of the mid ureter, iatrogenic injuries during open or endourological surgery and radiation damage (13).

If the ureteric loss cannot be repaired with intrinsic urinary tract tissues, ureteric replacement is indicated. Various surgical techniques have been proposed for replacing damaged ureters including the use of synthetic material, free autologous or pedicled grafts (14).

Ileal substitution of the ureter is a well established procedure, for the repair of damaged ureters, but reported results are controversial. While good results have been reported (15), others concluded differently (16). To improve the functional outcome of this operation 2 main technical modifications were suggested: tailoring the bowel segment and non-refluxing ileovesical anastomosis (17). These two main rules were not respected by the surgeon in our case.

Tailoring would decrease the cross-sectional diameter, improve the propulsion of the urinary bolus, limit the absorbing surface area and decrease mucous and stone formation. The antireflux mechanism would protect the upper tract from waves of high pressure during the voiding phase of the voiding cycle and ascendant infections. Prospective randomized study comparing simple ileal replacement and modified ileal ureter show better results with the latter procedure (18). The risk of the ureterointestinal junction stenosis is not negligible with the two procedures.

An unexpected ureteric injury can be a serious complication of intra-abdominal or retroperitoneal surgery as our case. The ureter can be injured anywhere along its retroperitoneal course but the frequency of injury increases in the distal segment. Pathological distortion of the ureteric anatomy and bleeding that obscures operative visibility increase the risk of injury (19). It is imperative that all surgeon performing procedures around

the ureter to be aware of potential injury, risk factors, necessity and techniques for early recognition and correct repair. Such knowledge will significantly decrease the risk of involuntary injury and allow prompt treatment. Iatrogenic ureteral injury may prolong treatment duration, treatment costs and may require further corrective surgery, frequently result in litigation. The legal responses to this serious situation depends on the countries, the law and operative conditions (emergency, local conditions,...), with some accepting that despite all due care a few injuries still occur (20), whereas others seek specific causality in each case (21). If the negligence of the surgeon is proven, consequences will be really grave.

So what should we do in such situations?

Certainly prevention remains the best treatment of any complication. We must know what to do? When to do it? and especially correctly.

We must be, as surgeon, able to treat the pathology but also complications due to our intervention. We have to be able to correct our iatrogenic damages, not the most usual situations but all of them.

Can preoperative imaging or ureteric catheterization prevent injury?

Prophylactic ureteric stenting remains unproven as a strategy for decreasing ureteral injuries. However, their use may allow the early identification of injury and in selected cases could be justified (22). Did the first surgeon do what he had to do? Apparently: No.

What are the options for managing a recognized injury?

Ureteric repair can vary from removal of an encircling ligature to autotransplantation. The technique used is determined by the site of the injury and the quality of the adjacent ureter. Reimplantation into the bladder, into a Boari flap (23) or to a psocic bladder are well documented options for distal ureteric injuries, while transuretero-ureterostomy may be used for more proximal injuries where the upper renal tracts are normal.

If the injury is localized, a stented end-to-end anastomosis may be possible. Long ureteric defects can be replaced by an ileal segment. Autotransplantation is the last option in extensive ureteric loss. For others, when the reconstructive solution is complex in a weak patient with a normal contralateral kidney, nephrectomy may minimize operative risk and future complications (19).

These injuries can be minor with no long-term sequelae, or they can result in significant morbidity and inconvenience to patients as in our case. It is these latter cases where legal action may ensue. Thus, patients require adequate preoperative counselling about the potential risk of ureteric injury and its consequences (19). When happened, they should be clearly and contemporaneously documented, as complications after a technically difficult procedure may be less likely to be viewed as negligent.

Although an intraoperative diagnosis of ureteric injury is preferable, vigilance in the early postoperative period is mandatory to detect early any complication. Long term complications, will be detected by biological and radiological investigations during follow-up.

CONCLUSION

Iatrogenic ureteral injuries are not so uncommon. Early diagnosis and correct treatment are required to prevent

complications and legal consequences. Patients must be informed about this real risk.

References

1. Moroni G, Gallelli B, Banfi G, Sandri S, Messa P, Ponticelli C. Long-term outcome of idiopathic retroperitoneal fibrosis treated with surgical and/or medical approaches. *Nephrol Dial Transplant*. 2006;21:2485-90.
2. Vasse N, Rigaud J, Cathelineau X, Buzelin JM, Bouchot O. Substitutive non-modeled uretero-ileoplasty. *Prog Urol*. 2001;11:636-41.
3. Gilkeson GS, Allen NB. Retroperitoneal fibrosis. A true connective tissue disease. *Rheum Dis Clin North Am*. 1996; 22: 23-38.
4. Keith DS, Larson TS. Idiopathic Retroperitoneal Fibrosis. *J Am Soc Nephrol*. 1993; 3:1748-52.
5. Feinstein RS, Gatewood OM, Goldman SM, Copeland B, Walsh PC, Siegelman SS. Computerized tomography in the diagnosis of retroperitoneal fibrosis. *J Urol*. 1981;126: 225-9.
6. Brun B, Laursen K, Sørensen IN, Lorentzen JE, Kristensen JK. CT in retroperitoneal fibrosis. *AJR Am J Roentgenol*. 1981;137:535-8.
7. Higgins PM, Bennett-Jones DN, Naish PF, Aber GM. Non-operative management of retroperitoneal fibrosis. *Br J Surg*. 1988; 75: 573-7.
8. Harreby M, Bilde T, Helin P, Meyhoff HH, Vinterberg H, Nielsen VA. Retroperitoneal fibrosis treated with methylprednisolone pulse and disease-modifying antirheumatic drugs. *Scand J Urol Nephrol*. 1994; 28: 237-2.
9. Marcolongo R, Tavolini IM, Laveder F et al. Immunosuppressive therapy for idiopathic retroperitoneal fibrosis: a retrospective analysis of 26 cases. *Am J Med*. 2004; 116: 194-7.
10. Moroni G, Dore R, Collini P. Idiopathic retroperitoneal fibrosis. *J Nephrol*. 2005; 18: 794-808.
11. Loffeld RJ, van Weel TF. Tamoxifen for retroperitoneal fibrosis. *Lancet*. 1993; 341: 382.
12. Miles RM, Brock J, Martin C. Idiopathic retroperitoneal fibrosis. A sometime surgical problem. *Am Surg*. 1984;50:76-84.
13. Ali-el-Dein B, Ghoneim MA. Bridging long ureteral defects using the Yang-Monti principle. *J Urol*. 2003; 169:1074-7.
14. Kaufman JJ. Ureteral replacements. In Bergman H ed. *The Ureter*. Chapter 25. New York: Harper & Row, 1967: 579.
15. Goodwin WF, Winter CC, Turner RD. Replacement of the ureter by small intestine: Clinical application and results of the ileal ureter. *J Urol*. 1959; 81: 406-18.
16. Boxer RJ, Fritzsche P, Skinner DG et al. Replacement of the ureter by small intestine: clinical application and results of the ileal ureter in 89 patients. *J Urol*. 1979;121: 728-31.
17. Hendren WH. Tapered bowel segment for ureteral replacement. *Urol Clin North Am*. 1987; 5: 607-16.
18. Shokeir AA, Ghoneim MA. Further experience with the modified ileal ureter. *J Urol*. 1995; 154: 45-8.
19. Preston JM. Iatrogenic ureteric injury: common medicolegal pitfalls. *BJU Int*. 2000;86: 313-7.
20. Schlund GH. The physician's duty to explain the possibility of damage to the ureter during abdominal hysterectomy. *Geburtshilfe-Frauenheilkd*. 1984; 44: 758-9.
21. Brudenell M. Medico-legal aspects of ureteric damage during abdominal hysterectomy. *Br J Obstet Gynaecol*. 1996; 103: 1180-3.
22. Bothwell WN, Bleicher RJ, Dent TL. Prophylactic ureteral catheterisation in colon surgery. a five-year review. *Dis Colon Rectum*. 1994; 37: 330-4.
23. Blandy JP, Badenoch DF, Fowler CG, Jenkins BJ, Thomas NW. Early repair of iatrogenic injury to the ureter or bladder after gynecological surgery. *J Urol*. 1991; 146: 761-5.