

Acute Renal Failure and Ureteral Leak After Open Surgery Aortoiliac Aneurysm Repair

Senija Rasic¹, Alden Prcic², Damir Rebic¹, Damir Aganovic², Nedžad Rustempasic³, Vesna Sarajlic⁴, Ismar Rasic⁵

Clinic of Nephrology, Clinical Center University of Sarajevo, BiH¹

Clinic of Urology, Clinical Center University of Sarajevo, BiH²

Clinic of Vascular Surgery, Clinical Center University of Sarajevo, BiH³

Clinic of Radiology, Clinical Center University of Sarajevo, BiH⁴

Clinic of Urgent Medicine, Clinical Center University of Sarajevo, BiH⁵

CASE REPORT SUMMARY

We present a case of 52 years old male with an acute renal failure that took place 4 days after open transabdominal surgery repair of infrarenal abdominal aneurysm along with aneurysm of left common iliac artery and dilatation of left external iliac artery. Patient was subjected to 13 hemodialysis treatments that resulted in satisfactory recovery of renal function. One month after aneurysm repair he developed the right ureteral leak, consequently urinoma and acute renal failure once again. We suppose that ureteral leak was related to segmental ischemic necrosis of right ureter but not to traction or other iatrogenic ureteral injury. Percutaneous nephrostomy and insertion of ureteral stent was resulted in complete recovery of renal function.

Key words: renal failure, ureteral leak, abdominal vascular surgery

1. INTRODUCTION

Acute renal failure with right ureteral leak and issuing urinoma is a very rare complication after surgical repair of infrarenal abdominal aortic aneurysm and aneurysm of iliac artery through the transabdominal approach. In most vascular surgical series, direct ureteral injury occurs in less than 1% of cases, especially during retroperitoneal vascular surgery, while ureteral obstruction occurs from 2% to 14% of aortoiliac reconstructions (1). We report a case of repeated acute renal failure and symptomatic urinoma after transabdominal vascular surgical intervention emphasizing etiology, diagnostic and therapeutic aspects of this rare condition.

2. CASE REPORT

A 52 year-old male was treated by vascular surgeon through the transabdominal approach for infrarenal aneurysm of abdominal aorta along with aneurysm of common iliac and dilatation of external iliac artery. Right aortoiliac and left aorto femoral reconstruction with 18/9 mm bifurcation Dacron graft was performed. Preoperatively, it was verified presence of left hypoplastic kidney and compensatory hypertrophy of right kidney on computed tomography angiogram. His serum creatinine level was 118 $\mu\text{mol/l}$. On fifth postoperative day he presented with progressive oli-

guria, appearance of pleural and abdominal effusion, right flank pain that turned into acute renal failure (BUN 20,3 mmol/l, serum creatinine 1278 $\mu\text{mol/l}$). CT scan revealed the edema of the right kidney parenchyma. The patient was admitted to Clinic of Nephrology where 13 haemodialysis treatment sessions were performed which resulted by polyuric diuresis and rapidly decreasing serum creatinine to the value of 226 $\mu\text{mol/l}$.

One month after vascular surgery operation the patient became febrile with onset of severe right flank pain that was projecting into right testis, decrease of diuresis and elevation of serum creatinine once again. Ultrasound revealed compressive mass behind the lower pole of right kidney that increased between two consecutive examinations (from 5x5 cm to 14.1x10.2 cm). Computed tomography (CT) of the abdomen (Figure 1) revealed presence of a mass 15 x 15 cm in size, arising from the right kidney with a fluid level in the superior aspect, without signs of blood leakage from vascular anastomotic site. The diagnosis of urinoma was made.

Creatinine concentration in the fluid that was drained amounted to 4485 $\mu\text{mol/l}$ while serum creatinine concentration was 425 $\mu\text{mol/l}$. Right percutaneous nephrostomy was done. Anterograde pyelography has been performed through right percutaneous nephro-

stomy and extravasation of urine from pyeloureteric segment of right kidney was confirmed. After anterograde pyelography ureteric stent was inserted. Fluid drainage via percutaneous catheter (first day 8150 ml) and application of ureteral stent resulted in the gradual resolution of the compressive mass (Figure 2) and full recovery of patient renal function (serum creatinine 106 $\mu\text{mol/l}$, BUN 6,9 mmol/l) during the period of one month. Percutaneous catheter was withdrawn 8 days later, while percutaneous nephrostomy was successfully withdrawn after 6 more weeks due to reestablished urine output through the right ureter.

3. DISCUSSION

There are numerous predictive factors that are included in etiology of acute renal failure after open surgical repair of aneurysm. Godet found that age above 50 years, preoperative renal dysfunction, duration of renal ischemia and amount of blood transfusion are significant predictors of this complication (2). Regional hypothermic perfusion and minimal clamping time are important elements in the prevention of renal failure after aortic vascular surgery (3). Use of injectable contrast media may lead to development of vasoconstriction and medullar ischemia (4), with subsequent reduction of glomerular filtration rate (5). It is therefore necessary to adopt special care and adequate prophylactic measures for high risk patients that require an application of contrast media preoperatively.

Iatrogenic ureteral injury is infrequent complication during vascular reconstructive surgery, with overall incidence of 0,8-2,2%, while direct injury occurrence in 0,6-0,85% of cases (6). These injuries are usually not confirmed intraoperatively. They can lead to asympto-



FIGURE 1. Computed tomography of the abdomen revealed presence of a mass 15 x 15 cm from the right kidney with a fluid level in the superior aspect



FIGURE 2. Fluid drainage via percutaneous catheter and application of ureteral stent resulted in the gradual resolution of the compressive mass and recovery of renal function

matic hydronephrosis postoperatively in 20% of cases, while only 2% of cases are symptomatic. A few cases of urinoma secondary to abdominal aortic aneurysm surgery are also reported (7).

Our patient developed symptomatic hydronephrosis and ureteral leakage one month after abdominal vascular surgery. Medial transabdominal infra-renal abdominal aortic aneurysm (AAA) surgery very rare produced iatrogenic traction

ureteral injury, because the use of stationary retractors during this surgery is minimal, as well as mobilization of the kidney from its retroperitoneal fossa. Sheehan et al. reported few cases of ureteral injury following AAA repair using retroperitoneal approach, probably caused by traction upon the ureter (6). On the right side, ureter is located posterior to the duodenum and just lateral to the inferior vena cava so usage of stationary omnitract retractors during transabdominal operation that were not placed further away from the lateral border of vena cava is highly unlikely causative factor of ureter trauma. Since pyeloureteric arterial branches are supplied by renal arteries and aorta, authors believe that abdominal aneurysm repair may lead to segmental ureteral devascularization and ischemic necrosis with resulting ureteral leak.

To our knowledge symptomatic urinoma on right side after vascular surgery, especially in the pyeloureteric segment is a very rare. Percutaneous nephrostomy and insertion of ureteral stent instead of open surgery repair was successful method of treatment of hydronephrosis and ureteral leak, with carefully

monitored of renal function and treatment of acute renal failure.

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Corresponding author: Prof Senija Rasic, MD, PhD. Clinic of Nephrology, Clinical Center University of Sarajevo, Bolnicka 25, 71000 Sarajevo, BiH, Email: rasicnef@bih.net.ba

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