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CASE REPORT

A fatal mycotic sepsis after retrograde intrarenal surgery: a case report and literature review

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ABSTRACT

Purpose: The retrograde intrarenal surgery (RIRS) is a procedure that sees an increase in its use every day and is supported by excellent results in terms of safety and feasibility. We report the first case of fatal mycotic septic complication in a neurological patient for renal stone disease.

Case presentation: The case of a woman 44 year-old, with left solitary kidney and history of advanced multiple sclerosis, epilepsy, bedridden and percutaneous endoscopic gastrostomy was described. She was hospitalized for the presence of recurrent lower urinary tract infections. The computed tomography (CT) scan control revealed a 1.7 cm obstructive renal pelvic stone and multiple stones in the bladder. After the refusal of a percutaneous approach, a RIRS was planned and done. No intraoperative complications were observed. In the postoperative period, she developed a urinary sepsis with progressive deterioration of the general conditions. She died 6 days after the RIRS for septic shock with a blood culture positive for *Candida glabrata*.

Discussion: A Pubmed search for fatal complications after RIRS shows only two cases not fully elucidated.

Conclusions: The use of flexible ureteroscopes and holmium lasers has a high succes rate;nevertheless, the possibility of a major complication should be kept in mind in order to evaluate all the risk factors, to adopt all the preventive measures for the safety of the patients.

Keywords: *Candida glabrata*, Complication-death, Flexible ureteroscopy, Renal stone, Retrograde intrarenal surgery, Septic shock

Introduction

The continuous advances in ureteroscopy, associated with technological progress and miniaturization, have made the flexible ureteroscopy more accessible in the daily practice. Retrograde intrarenal surgery (RIRS) is increasingly considered as the treatment of choice for the management of kidney stones <2 cm (1). This is constantly strengthened by the large amounts of new studies and data that documented the safety and feasibility of the procedure, with high stone-free rate, lower complications and morbidity associated. Nevertheless, the possibility of extremely rare fatal complications were underreported.

We report the first case of mortality after a RIRS procedure in a patient who developed a severe mycotic sepsis, focusing the attention on the possibility to have a fatal complication, although there are no preoperative contraindications or intraoperative complications.

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Case report

A 44-year-old Caucasian woman with left solitary kidney-was affected by advanced multiple sclerosis with concomitants epileptic crisis; moreover, she was bedridden with a percutaneous endoscopic gastrostomy and indwelling catheter. She presented an already known history of urolithiasis with recurrent lower urinary tract infections and allergy to several antibiotics (e.g. teicoplanin and ciprofloxacin). She was hospitalized for relapsing fever in a clinic department and successfully treated with antibiotics for a positive uroculture for *Pseudomonas aeruginosa*. The computed tomographic (CT)-scan control revealed a 1.7 cm obstructive renal pelvic stone (HU about 600) and multiple stones in the bladder. She was transferred to the urological department. The patient refused the percutaneous nephrolithotomy (PCNL) preferring a less invasive retrograde approach. The preoperative uroculture was negative; antibiotic prophylaxis was administered. Under general anesthesia, the patient was placed in lithotomy position and a clearance of the small bladder stones was preliminarly done. Furthermore, a left pyelography was performed revealing a normal urinary system with a mild radiopaque stone into the renal pelvis. After this, a 12/14 Ch

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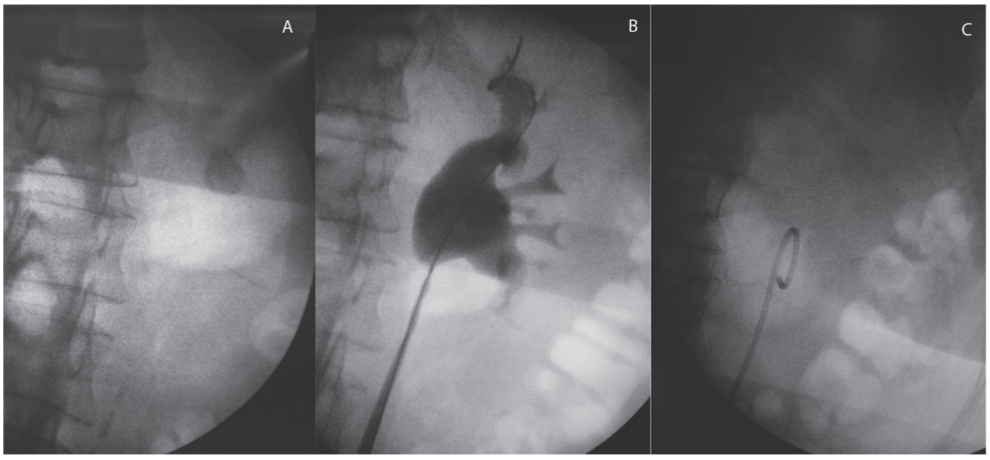

Fig. 1 - Intraoperative radiographic sequence of the RIRS. (**A**) Initially RX; (**B**) Retrograde pyelography; (**C**) Completed dusting of the stone and double-J left in situ.

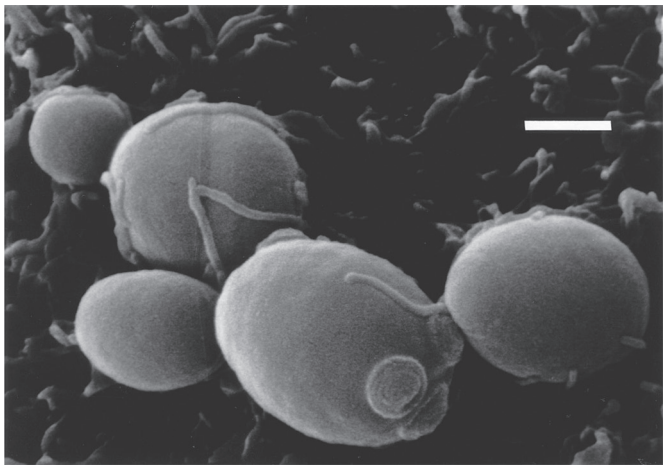

Fig. 2 - Scanning electron micrograph of *C. glabrata* adhering to cultured HEp2 cells.

ureteral access sheath (UAS) was placed alongside a safety guide-wire and the flexible ureteroscopy was introduced. Active pressure irrigation was cautiously used, but a culture sample was not taken. The stone was clearly visible in the pelvis and, using a 200 µm fiber, a complete dusting procedure was performed with Holmium laser with a high pulse rate (20-40 Hz) and low energy (0.2-0.6 J). The operative time was 75 minutes;the procedure was atraumatic without complications and the ureteral integrity was checked while taking out the ureteroscope. A double-J 8Ch and a Foley catheter were left in situ (Fig. 1).

From the first postoperative day, she had high fever (>38.5°C), tachycardia (heart rate >90/min), with constant leukocytosis [white blood cell (WBC) count >20,000/µL]. According to the infectious disease consultancy, the antibiotic therapy has been strengthened and an antimycotic was added,but she developed a severe sepsis with progressive anemia, anuria, tachypnea and altered mental status. She was transferred in the Intensive Care Unit and managed according to the algorithm for the severe septic shock. Nevertheless, she died 6 days after the RIRS for multisystem organ failure secondary to septic shock and the blood culture was positive for *Candida glabrata* (Fig. 2).

Discussion

Actually, flexible ureteroscopy is a routine procedure for the treatment of urolithiasis and for the diagnosis and management of upper urinary tract pathology (2, 3). In terms of safety and feasibility, the literature shows excellent results and low rate complications. The EAU guideline reported an intraoperative, early and late complications rate of 3.6%, 6.0% and 0.2%, respectively. Recently, Fall et al. showed a series of 219 procedure with Clavien Dindo complications III and IV of 3% and 1.5%, respectively, and no grade V (4).

In all the literature available, we found only two references to fatal complications and one case report for renal failure after RIRS. In 1997, Robert et al, in a retrospective series of 18 procedures, recorded a case of death for fatal septic shock after RIRS for a very large stone (5). In 2007, Bandi et al. described a case report of anuric renal failure after a bilateral RIRS for bilateral stone disease (6). Last in 2010, Justin et al. reported a retrospective series of 1757 consecutive ureteroscopic procedures with one case of death for septic shock, but the Clavien-Dindo V report was 0 (7). Almost certainly, these infections are related to the coated seeds in the stones released during the fragmentation and spread with the help of the irrigation liquid. Albeit they are well-known complications, it should be emphasized that severe sepsis and septic shock are critical states, with deadly rates ranging from 28.3% to 41.1%, respectively (8).The use of prophylactic antibiotics with a negative preoperative urine culture is a controversial topic;anyway, the EAU guidelines recommends the administration prior to surgery. Especially in our patient with a solitary kidney, it was necessary to prevent any potential damage of renal function produced by urolithiasis (9). Moreover, in order to minimize the septic complications, we observed these important criteria: sterile pre-operative urine; administer prophylactic antibiotics; placement of UAS; irrigation with controlled outflow; and careful observation in the first 6 postoperative hours. Despite carefully assisted, she developed a fatal rare systemic event caused by a *C. glabrata* infection. This is a commensal fungal organism but works like an important nosocomial pathogen that typically affects immunocompromised, debilitated, postsurgical and catheterized patients especially if recently treated with antimicrobial agents. It has a strong resistance to antifungal agents and it is responsible for 20% of

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the Candida urinary tract infections. Disseminated candidiasis has a high mortality rate because the advanced state of deterioration of the clinical condition of the patients. Unfortunately, there are no characteristic signs or symptoms and the persistent fever, despite medical therapy, is usually the only manifestation (10).

Publications about major and fatal complications after RIRS are almost nonexistent and probably underreported and usually not deeply described. From our point of view, more searches of factor risks should be done on larger series and spanning multiple institutions and years in order to reduce the incidence of potentially catastrophic effect. Moreover, as already done in other fields of urology, the use of standardized methods of reporting complications after RIRS should be encouraged in order to evaluate the true morbidity associated with this operation even across institutions.

Conscious of its extraordinary safety profile, the continuous innovation and development in this field, the RIRS is not free from major complications and little is know about extremely rare fatal complications.

Disclosures

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Conflict of interest: Luca Cindolo is a surgical tutor for AMS Tegea. Berardinelli, Castellan, Castellucci, Pellegrini, Schips declare no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous 3 years; no other relationships or activities that could appear to have influenced the submitted work.

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