Clinical studies

Morbidity of retrograde flexible ureteroscopy – are there any specific complications?

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Abstract

Introduction: It was considered for a long period of time that flexible ureteroscopy have no specific complications. The aim of this study was to evaluate its morbidity on a significant number of cases.

Material and methods: We retrospectively reviewed the morbidity associated with retrograde flexible ureteroscopic approach for pyelocaliceal stones in 369 cases. In all cases we used a Storz Flex-Xc flexible ureteroscope.

Results: Complication rate was 19.2%. Clavien I and II complication occurred in 16.2% of the cases, Clavien III occurred in 3% of the cases. No Clavien IV and V complications were encountered. 4.4% of the cases presented intraoperatively grade 2 and 3 ureteral wall injuries (Traxer and Thomas classification). 7% of the complications were septic. In two cases we encountered a renal hematoma and in one case a subcapsular hematoma, which we didn’t encountered in any semirigid ureteroscopy. In one case we encountered massive liquid extravasation in the retroperitoneum. All these 4 cases were managed conservatively.

Conclusions: Retrograde flexible ureteroscopic approach is an efficient diagnostic and treatment method for upper urinary tract pathology. The safety of this procedure is very good, most of the complications being minor.

Key words: complications, flexible ureteroscopy, ureteral access sheath

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Introduction

Flexible ureteroscopy is nowadays a routine procedure in many urological centers worldwide. In the context of a large number of cases undergoing such an intervention every year, a significant quantity of data regarding its morbidity is also gathering.

With the technological progress, the indications and the procedural complexity increased, and so did the potential morbidity.

The situation is constantly changing in this field, the manufacturers trying to develop new flexible ureteroscopes models with increased durability and increased efficacy and safety. From this point of view, it is difficult to compare series operated with older models with those in which the last generation ones are involved.

The aim of this paper was to evaluate the morbidity associated with this procedure, performed with one of the last generation flexible ureteroscope, on a significant number of cases.

Material and methods

We retrospectively reviewed 369 cases in which retrograde flexible ureteroscopic approach was performed for pyelocaliceal stones at “Saint John” Emergency Clinical Hospital. In all cases we used a Storz Flex-Xc flexible ureteroscope.

In cases in which its insertion (with a reasonable push force applied) was impossible, a ureteral JJ stent was indwelled for passive dilation and the procedure was attempted again after 7-14 days.

Ureteral access sheath was used in most of the cases in order to reduce the pressure in the collecting system, assure facile re-entry and protect the flexible ureteroscope. The stones were extracted “en bloc” with baskets or lithotripsy was performed with a 20W Medilas Dornier holmium laser. If a ureteral access sheath was used, at the end of the procedure the flexible ureteroscope was always extracted together with it with complete visual inspection of the ureter.

If any ureteral wall injuries were recorded, they were categorized using the scale of Traxer and Thomas [1]. Only the high grade lesions (involving at least the muscular layer of the ureteral wall) were classified as complications.

The intraoperative incidents and complications, as well as the postoperative complications were evaluated and categorized according to the severity scale proposed by Clavien [2].

Results

The overall complication rate was 19.2%, most of them being specific to the endoscopic approach in general rather than to the flexible ureteroscopy (prolonged hematuria, fever etc.).

Regarding the intraoperative incidents and complications, those associated with the ureteral access sheath may be considered as specific to the flexible ureteroscopic approach. 8% of the patients required JJ stent insertion due to difficulties to advance the access sheath, while 4.4% of the cases presented, according to Traxer and Thomas classification, intraoperative grade 2 (ureteral wall injury, including mucosa and smooth muscle, with adventitial preservation, periureteral fat not seen) (fig. 1) and 3 (ureteral wall injury, including mucosa and smooth muscle, with adventitial perforation, periureteral fat seen) ureteral wall injuries.

Clavien I and II complication occurred in 16.2% of the cases, Clavien III occurred in 3% of the cases. No Clavien IV and V complications were encountered.

7% of the complications were septic.

In two cases we encountered intraparenchimatous renal hematoma of 2-4 cm. and in one case a subcapsular hematoma with maximum width of 1.5 cm. One case presented lumbar pain while the other two were asymptomatic, the complication being documented during a follow-up ultrasonography. In one case complaining of nausea, vomiting and intense flank pain, CT scan described massive liquid extravasation in the retroperitoneum.

All these 4 cases were managed conservatively.

Discussions

In the era of miniaturization in endourology, the use of small caliber flexible ureteroscopes has a low poten-
Ureteral access sheath, a device used almost exclusively during flexible ureteroscopy, was suspected as a factor which increases the morbidity of the procedure. In a study by Traxer and Thomas, ureteral wall injuries related to the use of this instrument were present in 46.5% of the patients, most of them (86.6%) being low grade, and only 13.4% high grade, with muscular layer involvement (grade 2 and 3) [1].

In our series the ureteral wall injuries involving the muscular layer were encountered in 4.4% of the cases, the main reason for such a reduced rate being probably the prudent use of the ureteral access sheath.

Renal hematoma (intraparenchimatous or subcapsular) were reported as related to flexible ureteroscopic approach, however this complication being a rare occurrence [5, 6]. Some of the authors speculate that its cause is either unintentional laser fiber thrust into the stone or increased pressure into the pyelocaliceal system [6]. In our cases we did not observed significant lesions of the calices or renal pelvis, so we believe that the second theory is the most probable one. No such complications were encountered in our experience on a significant number of cases which underwent semi-rigid ureteroscopy [7] so it is reasonable to consider that some other factors related to the retrograde intra-renal lithotripsy or the presence of the endoscope in the pyelocaliceal system may be involved.

Most of the cases do not impose active interventional measures, being managed only conservatively. There is only one case reported in the literature in which a life-threatening subcapsular renal hematoma imposed superselective arterial embolization [8].

The complications rate does not seem to be influenced by the body mass index [9]. Regarding the stone size, the CROES study, evaluating 1210 cases find no influence over the overall complications incidence. However, in patients with stones larger than 20 mm, postoperative fever may occur more frequently by comparison to those with smaller stones [10].

Even in centers with reduced experience, the complications rate of the flexible ureteroscopy is reduced, most of them being mild. Barbier et al., evaluating the initial 225 procedures, report a 8% complication rate, all being Clavien I and II [11].

Recent studies comparing the morbidity of SWL and flexible ureteroscopy revealed similar complications rates between the two procedures [12].

Conclusions
Retrograde flexible ureteroscopic approach is a safe procedure, most of the complications being minor.

The frequent use of the ureteral access sheath does not increases the morbidity, as long as it is prudently maneuvered.

Some rare complications, such as renal/subcapsular hematoma may occur, however their management being conservative in most of the cases.

Acknowledgement
This work received financial support through the project “CERO – Career profile: Romanian Researcher”, grant number POSDRU/159/1.5/S/135760, co-financed by the European Social Fund for Sectorial Operational Program Human Resources Development 2007-2013.

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Fig. 2
Superficial lesions on the caliceal mucosa after Holmium laser lithotripsy


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