Urolithiasis

OUTCOMES OF FLEXIBLE URETEROSCOPIC LASER LITHOTRIPSY FOR URETERAL STONES AND RENAL STONES: A SINGLE CENTER EXPERIENCE

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Purpose: Significant improvements in the field of flexible ureterorenoscopes (FURSs) have been made in the past 2 decades. Advances in distal-tip deflection, improved scope durability, decreases in scope diameter, improved image quality, and extended field of vision and the advent of the holmium:yttrium-aluminium-garnet (YAG) laser have all strengthened the role of flexible ureteroscopy from a diagnostic tool to a therapeutic procedure. In Western tertiary medical centers, flexible ureterorenoscopes have already routinely used for the management of calculus disease. However, the clinical applications of flexible ureterorenoscopes in Taiwan were relatively late. To review literature, no related flexible ureteroscopy experience was reported. In current study, we shared the outcomes of flexible ureterorenoscopic laser lithotripsy toward ureteral stones and renal stones.

Materials and Methods: We retrospectively reviewed patients who received flexible ureterorenoscopic laser lithotripsy from 2014/08 to 2016/03 due to renal stones or upper third ureter stones. Based on the last image before FURS, we recorded the stone sizes and stone location. Most of these patients (70.6%) received abdominal computed tomography before FURS. According to abdominal CT results, hounsfeld unit of urinary calculi was documented as above 900 and below 900. Besides, after FURS, residual stone size was recorded based on the first image. Stone free was defined as no visible stone or size below 5mm. Whether patients received ESWL or repeated lithotripsy management or not after FURS was also recorded. All surgeries were performed by one Urologist using an 8.5-Fr (Olympus America Inc., Center Valley, PA, USA) flexible ureterorenoscope type V. Patients were placed in the lithotomy position under general or spinal anesthesia. Cystoscopy was performed routinely before flexible ureteroscopy in all patients to place a hydrophilic guidewire into the renal pelvis. After the passage of a safety guidewire into the renal pelvis, a ureteral access sheath was placed to facilitate FURS to pass up to renal pelvis. Ureteral stones were fragmented with a holmium:YAG laser with a 365-nm fiber. Laser energy and pulse frequency were varied on the basis of stone volume.

Results: A total of 34 patients was enrolled (25 males and 9 females). Mean age was 53.59 year old. Median size of urinary calculi was 2.04mm. Most of these patients were within renal stones (30/34), but 4 in these were within ureteral stones. 17 renal stones located in lower calyx and 7 renal stones in renal pelvis. Mean FURS surgery time was 62.56 minutes. 5 of these patients received further ESWL for residual stones. 7 patients received further surgery for residual stones. Median operation time was 65.6 minutes. 23 patients received abdominal CT before surgery, and 12 of them had less than 900 in hounsfeld unit. No correlation was found between hounsfeld unit and residual stone size. However, residual stone size was significantly related to operation time (p<0.05).

Conclusion: Flexible ureteroscope remains a highly promising diagnostic and therapeutic means to deal with renal stones or upper ureter stones, especially in those not suitable for PCNL. More clinical experience should be achieved after more practices. Hounsfeld unit did not correlate with residual stones, but operation time will have significant related with residual stones.

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THE COMPARISON OF ECONOMIC AND CLINICAL OUTCOME IN DEALING WITH PROXIMAL URETERAL STONE REQUIRING MULTIPLE PROCEDURES BETWEEN INITIAL URETEROSCOPIC LITHOTRIPSY OR EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY

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Purpose: To investigate the real-world clinical and economical feature of dealing with difficult proximal ureteral stones, we compared the total cost and clinical outcome in treating proximal ureteral stones requiring multiple procedures with initial ureteroscopic lithotripsy (URS-L) or extracorporeal shock wave lithotripsy (ESWL).

Materials and Methods: 213 patients undergoing both URS-L and ESWL for the same proximal ureteral stone were included in this study. The patient medical records, images, and billing statements of all patients for proximal ureteral stones between January 2011 and September 2015 at a regional hospital were reviewed. These patients had at least one episode of URS-L and ESWL during the whole course of managing the same proximal ureteral stone. Two groups were compared according to the initial treatment URS-L or ESWL. Furthermore, we divided these patients in different stone size groups (>1cm and <1 cm).

Results: A total of 81 patients were in the URS-L first group and 112 patients in the ESWL first group. The URS-L first group seemed to had higher total cost ($80147±27724 versus $67683±11229 TWD, p<0.0001), longer hospital days (3.81±3 versus 2.7±0.8 days, p=0.002), longer DBP placement days (17.8±11.1 versus 13.8±10.2 days, p<0.001), larger stone sizes (1.48±0.56 versus 1.04±0.47 cm, p<0.001), more pre-operative urosepsis (12.4% versus 0%, p<0.0001), chronic kidney disease (9.8% versus 0%, p<0.0001), and pre-OP acute kidney injury (19.6% versus 0%, p<0.001). The complication rate was comparable (1.2% versus 0%, 0.0–0.038). For stone smaller than 1 cm, 16 patients were in URS-L first group and 68 patients were in ESWL group. The total cost of URS-L first was statistically comparable (65271±9303 TWD versus 63926±8545 TWD, p=0.065). For stone 1 cm or larger, 65 patients were in URS-L first group and 64 patients were in ESWL first group. The total cost of URS-L first was statistical higher than ESWL first group ($83809±28995 versus 71674±12374 TWD, p<0.001) and hospital days of URS-L first were longer (3.97±3.31 versus 2.86±0.71 days). The URS-L first group also had more chronic kidney disease patient (12.6% versus 0%, p=0.006), pre-OP AKI (20% versus 0%, p=0.001) and pre-OP sepsis (12.6% versus 0%, p=0.006).

Conclusion: The urologists tended to use URS-L first to manage larger proximal ureteral stone and more complicated patients. The URS-L first groups seemed to deal with larger proximal ureteral stones and more complicated patients. The total costs of URS-L first were higher in stone size 1 cm or larger. The larger and complicated proximal stones accompanied with higher cost.