Antegrade flexible ureteroscopy in supine position for impacted multiple ureteric calculi

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ABSTRACT

Flexible retrograde ureteroscope is now being widely used in endoscopic management of the urinary calculi. We report technique of supine ante grade flexible ureteroscopy in treating impacted upper and mid ureteric calculi in a pediatric patient. A six year-old boy with a history of acute right ureteric colic was investigated and found to have right upper and middle impacted ureteric calculi. He was planned for ureteroscopy, but the intramural part of the ureter could not be dilated. Hence, a decision was taken to do an antegrade flexible ureteroscopy in the supine position. An antegrade renal access was established in the supine position using ultrasound-guided puncture, a 22 Fr Amplatz was placed after serial dilatation of the tract and the stones were accessed using a flexible ureteroscope. The stones were then disintegrated using holmium laser. The ureter was stented at the end of the procedure. IVU done after six months revealed normal right kidney.

Key Words: Flexible ureteroscopy, pediatric ureteral calculi

INTRODUCTION

The flexible instrument is useful for treatment of renal stones and other intra renal pathologies and also facilitates ureteral access for complex ureteral stones.[1] But, this new technique of the treatment is still challenging in pediatric urological practice. The position of the patient for access to the endoscopic procedure for upper urinary calculi, is an important issue. Though kidney can be accessed in either prone or supine positions, most endourologists prefer the prone position for the access to kidney. Herein we report a case of ante grade flexible ureterorenoscopy (URS) in treating impacted upper and middle ureteric stones in the supine position, in a pediatric patient wherein the access from the lower ureter was not possible. We believe that the ureter is more flexible and easy to maneuver in the supine position.

TECHNIQUE

A six year-old boy presented with a history of right ureteric colic of one month duration. During that period, he required hospitalization and treatment for his colic. There was no history of fever or hematuria. Serum creatinine was normal (0.6 mg/dl) and routine urine examination revealed pyuria (15-20/hpf), but the urine culture was sterile. A radiograph of the kidneys, ureters and bladder showed two calculi in the right upper and middle ureter with sizes 8 mm and 5 mm [Figure 1a]. Renal ultrasonography showed mild to moderate hydronephrosis, with dilated upper ureter up to the stone on the right side with good renal cortex and normal left kidney. Intravenous urography (IVU) demonstrated two stones in the right ureter, causing moderate obstruction of the Pyelocaliceal [Figure 1b].

In view of his clinical and IVU findings, he was planned for URS on the right side, as the stones were not suitable for SWL. Cystoscopy revealed normal urethra, bladder and ureteric orifices. The right ureter was cannulated using a 5 Fr open-ended ureteric catheter (Devon innovations; India) with guide wire. Guide wire 0.035 (Glide wire M RADIFOCUS®, Japan) could not be negotiated beyond the stone, so instead, a hydrophilic glide wire 0.025 (Guide wire Medi.Tech, Boston Scientific) was tried, but failed. The guide wire was kept upto the stone and the ureteric balloon dilator 4 cm/6Fr/4mm (Cook Urological Inc, Spenser, Indiana, USA) was taken to dilate the intramural part of the ureter, but it could not be negotiated at the vesicoureteric junction. Hence, 5 Fr ureteric catheter (Devon innovations; India) was placed upto the middle calculus and a decision was taken to do supine ante grade flexible URS.
Antegrade renal accesses were attained in the supine position using ultrasound-guided puncture, the guide wire was negotiated into the upper ureter and the tract was then serially dilated using Alken’s telescopic dilator upto 21/22 Fr Amplatz (Microvasive®, Boston Scientific) [Figures 2 and 4]. A flexible ureteroscope (ACMI DUR®-8ELITE) was passed over a guide wire to reach the upper ureteric stone. The stone was disintegrated with Holmium: YAG LASER (wave light-laser tech GmbH) and completely cleared. The guide wire was then passed upto the mid ureteric stone and the site of the upper ureteric stone was balloon-dilated, as it was not allowing the smooth passage of the flexible scope. The mid ureteric stone was then disintegrated using LASER. Following that, the guide wire was negotiated into the bladder for antegrade DJ stenting and a 4.8/16 DJS (Devon innovations; India) was placed. The kidney was drained by a 16 Fr (Nelaton catheter Romsons® NEL-CATH TM) nephrostomy [Figure 3].

The operative period was uneventful and the nephrostomy was removed after 48hrs. The patient was discharged from the hospital on postoperative day 3 and the stent was removed at 4 weeks. Six months follow up IVU revealed prompt function and good drainage of the contrast [Figure 5].

**DISCUSSION**

In 1929, the first ureteroscopy was done in a child by Young.
antegrade flexible ureteroscopy. Although antegrade flexible ureteroscopic manipulation has been reported in the past, it was not performed in the supine position. Shroff and Watson (1995) performed an antegrade flexible ureteroscopy successfully on a patient with lower ureteric stone following reimplantation, but the position of the patient was not elaborated.

Though we had planned for the standard ureteroscopic procedure in our patient, because of failure to negotiate the glide or guide wire across the stone and to dilate (balloon and teflon dilators) the lower ureter, we decided to do antegrade ureteroscopy. Our experience and technique of USG-guided puncture facilitated us to gain renal access in the supine position. Moreover, the flexible ureteroscope helped us to gain access into the upper and the mid ureter. The advantage was that we could access and clear the stones antegrade, without the need for the change in position and there was minimal morbidity. The use of USG to puncture the kidney in the supine position helped avoid any bowel injury which may occur in supine punctures.

CONCLUSION

Antegrade flexible ureteroscopy is a safe, feasible and effective procedure for an impacted pediatric ureteric calculus, when the stone cannot be accessed retrogradely. We believe that difficult ureteric stones can be approached antegrade and passing the flexible ureteroscope in the supine position increases its maneuverability and success.

REFERENCES