

NEEDLE RENAL LIFTING TECHNIQUE IN MANAGEMENT OF COMPLICATED PROXIMAL URETERAL LITHOTRIPSY: A CASE REPORT

¹Muhammad Risan, ¹Indrawarman, ¹Danarto, ¹Prahara Yuri.

¹ Division of Urology, Department of Surgery, Faculty of Medicine/Gajah Mada University, Sardjito General Hospital, Yogyakarta.

ABSTRACT

Objective: To describe a needle renal lifting technique using an 18-gauge needle to adjunct ureterorenoscopy (URS) in the management of complicated proximal ureteral stones. **Case(s) Presentation:** A 46 years old man presented with right flank pain for 1 month. This patient was diagnosed with ureteral stone and ureteral kinking that prohibits access to the proximal side of the ureter. Due to difficult access to the proximal ureter, we perform a needle renal lifting technique which is initialized by puncturing the middle renal calyx with 18-gauge needle. Then, the proximal end of the needle was pushed to the caudal direction to move the kidney to the cephalic direction and straighten the kinked ureter. After that procedure, the URS sheath can easily enter the proximal ureter to the stone site. **Discussion:** The success rate of this procedure is based on the operator skills to access the calyx and perform URS simultaneously. Like a previous technique, needle renal lifting is effective only when the kidney is mobile. **Conclusion:** The needle renal lifting technique can be used to adjunct URS in the management of complicated ureteral stones which prohibited access to the proximal ureter.

Keywords: Needle renal lifting, ureterorenoscopy, complicated ureteral stone.

ABSTRAK

Tujuan: Menjelaskan mengenai teknik operasi ureterorenoskopi dengan bantuan jarum ukuran 18G sebagai alat bantu dalam manajemen pasien dengan batu ureter proksimal dengan komplikasi. **Presentasi Kasus:** Seorang laki-laki 46 tahun datang dengan nyeri pinggang kanan sejak 1 bulan yang lalu. Pasien tersebut didiagnosa dengan batu ureter dan ureter kinking yang menghambat akses ke ureter proksimal. Karena sulitnya akses menuju ureter proksimal, dilakukan pengangkatan pada ginjal menggunakan jarum ukuran 18G yang terinsersi pada ginjal kaliks media. Kemudian ujung jarum proksimal didorong menuju kaudal, sehingga meluruskan ureter yang kinking tadi. Setelah prosedur itu dilakukan, sheath URS dengan mudah dimasukkan menuju ureter proksimal. **Diskusi:** Keberhasilan dari prosedur ini berdasarkan kemampuan operator dalam melakukan penusukan pada kaliks serta URS secara simultan. Teknik needle renal lifting hanya dapat dilakukan jika ginjal pasien tersebut mobil. **Simpulan:** Teknik needle renal lifting dapat di gunakan sebagai prosedur tambahan dalam manajemen dari batu ureter dengan komplikasi yang akses menuju ureter proksimal terhalang.

Kata Kunci: Needle renal lifting, ureterorenoskopi, batu ureter komplikasi.

Correspondence: Muhammad Risan, c/o: Division Urology, Department of Surgery, Faculty of Medicine/Gadjah Mada University, Sardjito General Hospital. Jl. Kesehatan No.1, Senolowo, Sinduadi, Mlati, Sleman, Yogyakarta 55281. Phone: +62 274 631190; Fax: (0274) 565639. Mobile phone: 08114057573. Email: mitarisan@gmail.com.

INTRODUCTION

Advances technology in endourology has to facilitate access to the upper urinary tract. Successful endourology procedures are highly related to the access of the pathologic lesion.¹ However, difficulties in accessing the ureter tract still are encountered. Access failure prohibited URS and caused a significant complication. This incident failure occurs in 1.6% of cases and may be associated with an abnormality in musculoskeletal, anatomy

pathologic of ureters such as stricture, extrinsic compression, obstruction by edema or stone, and iatrogenic trauma.² Due to this access problem conversion to open surgery is often done by urologists, which more invasive and has more complications. Based on previous studies, in case of difficult access to the ureter tract, Laparoscopic Retroperitoneoscopy Ureterolithotomy (RPLU), and Open Mini Incision Ureterolithotomy (MIU) were a choice if the URS procedure was unsuccessful. But open procedures were associated

with higher complications and longer hospitalization.²⁻³

Many techniques in obtaining access to the proximal ureter have been reported. For instance, manual compression of the kidney and ureteral traction using a balloon catheter. The occlusion technique using a balloon catheter in the distal part of the kinked can be used to apply gentle caudal traction and straighten the ureter to gain access.⁴⁻⁵ In this case we described a needle renal lifting technique using an 18-gauge needle to the performed gentle lifting of the renal and straightened the ureter to gain access for lithotripsy.

CASE(S) PRESENTATION

A 46 years old man came to the hospital with right flank pain. The pain was intermittent and feels sharp in sensation also migrate to the anterior of the

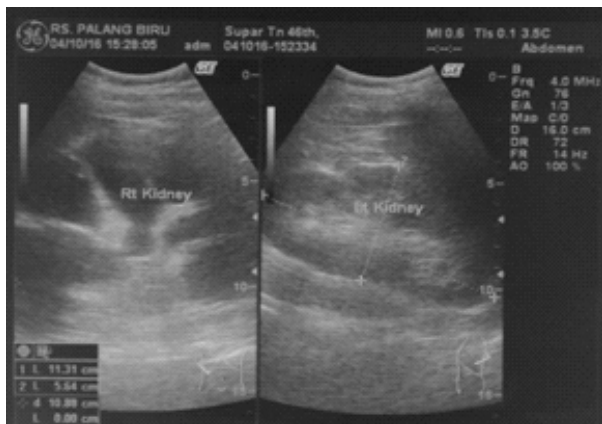


Figure 1. Widening of pelvicalyceal system of the right kidney in ultrasonography.

right abdomen. The patient was more comfortable if moving around, the pain was decreased by using analgesia. Patients also complain of nausea and vomiting. On the physical examination, we found tenderness at the right flank. In a urological ultrasound examination, there was pelvicalyceal widening in the right kidney with no apparent abnormalities in the left kidney and bladder (Figure 1). On the KUB-IVU examination, the contrast impression did not enter the right kidney (nonvisual right kidney).

The needle renal lifting technique was performed under fluoroscopic guidance, with the X-ray beam perpendicular to the tract. Initially, we performed retrograde pyelography to identify the level of obstruction and anatomy structure of the ureter. We found stenosis in the caudal part of the proximal ureter with kinked and stone in its cephalic part (Figure 3). At first, we tried to perform direct lithotripsy without using this technique, but we could not reach the stone site due to stenosis with the kinked ureter. Then we decide to performed the needle renal lifting technique. An 18-gauge needle was punctured in line with the middle calyx projection directed to the lower calyx (Figure 4A, 4B). A hydrophilic guidewire was inserted using URS at the level of obstruction (Figure 5). The needle's proximal end was pushed to the caudal direction, under continuous fluoroscopic monitoring (Figure 4C). Consequently, the kidney was pushed to the cephalic direction and made the ureter structure straightforward (Figure 6). Then the URS sheath could enter the proximal ureter, and lithotripsy was performed. Finally, we inserted a double-J stent to maintain the urethral tract.

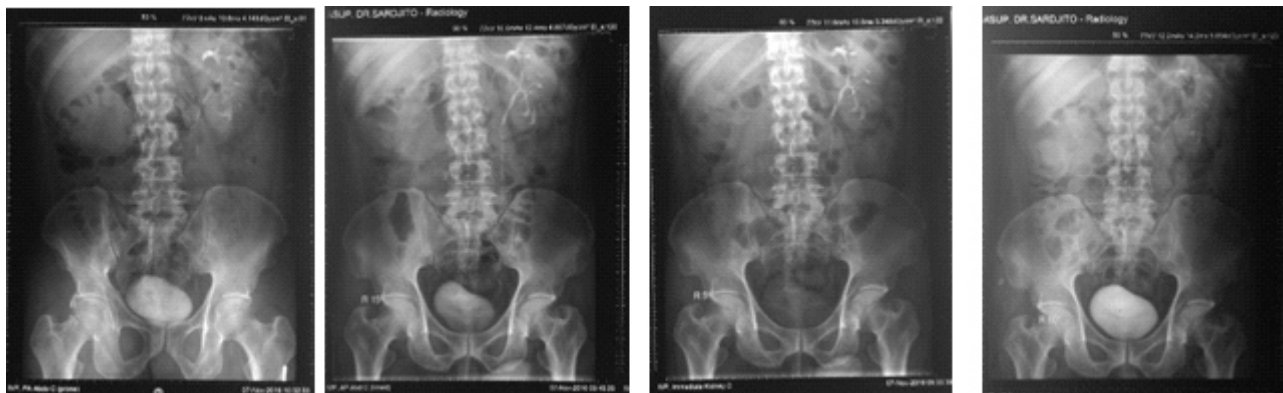


Figure 2 Non-visual right kidney in KUB-IVU.



Figure 3. Retrograde pyelography shows, multiple stenoses with a kink in and stone at the proximal site of the right ureter, which prohibited access of the proximal ureter.

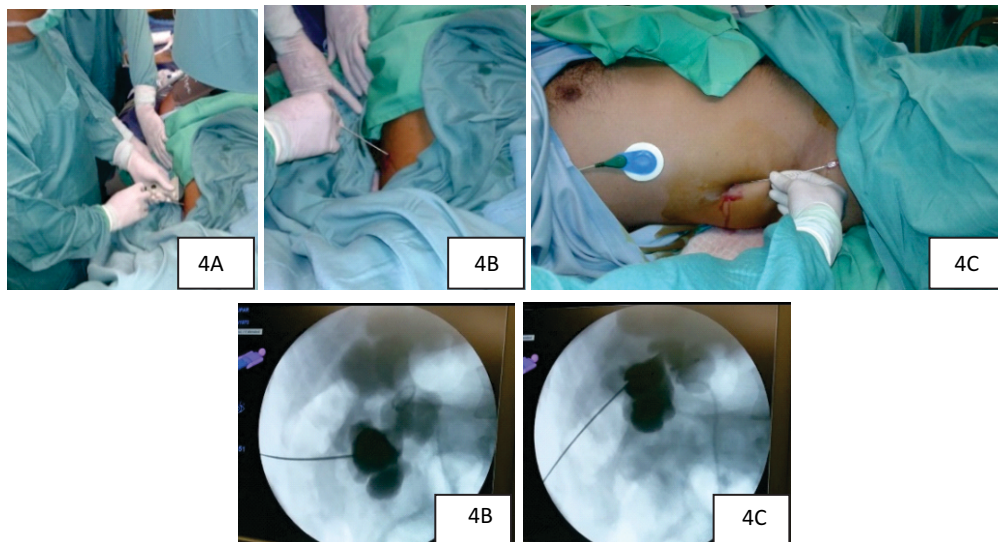


Figure 4. (A) An 18- gauge needle was punctured in line with middle calix projection. (B) The needle was directed to the lower calix. (C) The proximal end of needle was pushed in the caudal direction so the kidney could move upward.

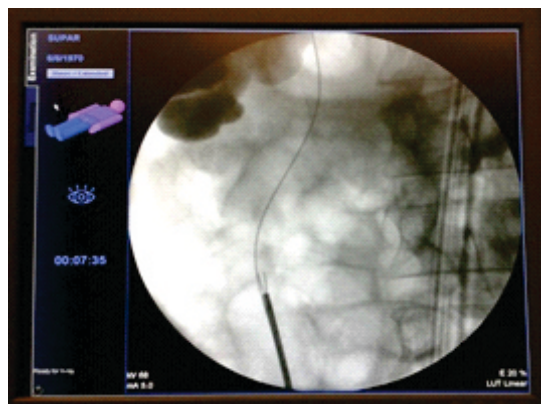


Figure 5. Guidewire was inserted and pass the obstruction level.

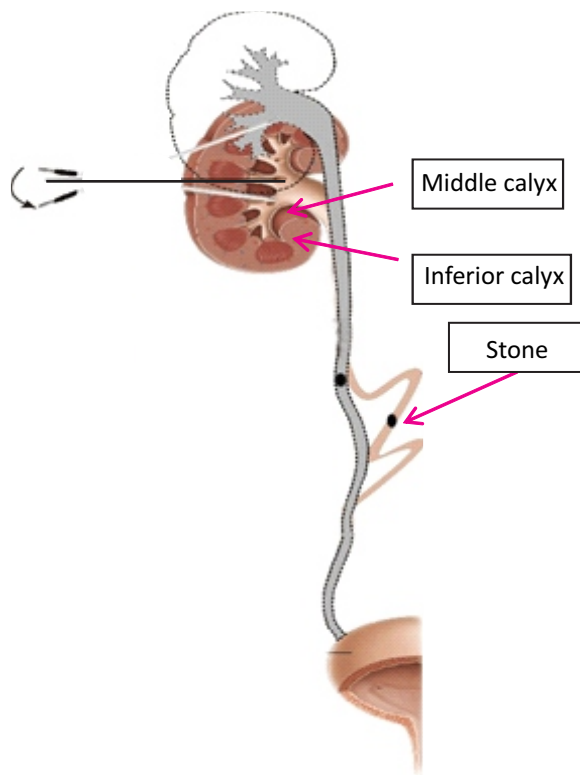


Figure 6. Illustration of needle renal lifting procedure.

DISCUSSION

This was the first experience performing this technique. At the beginning of the operation, we tried to use manual mobilization of the kidney by using upward pressure in the right anterior abdomen but it failed. Then we decide to straighten the ureter by performing needle puncture.

We had a concern about the risk of urothelium or renal parenchyma shear injury by the needle's distal end when we performed upward-lifting, but there was no hemorrhage or urothelium laceration was noted, nor any complication related to the technique. Lezrek et al. had performed a similar technique in the case of nephrolithiasis in the upper calyx and perform percutaneous lithotripsy.⁵ No complication was noted after the procedure.

Jai P and Byong et al. described in case of difficult access to the ureter tract, Laparoscopic Retroperitoneoscopy Ureterolitotomy (RPLU), and Open Mini Incision Ureterolithotomy (MIOU) were a choice if the URS procedure was unsuccessful.³ But in both of the above procedures, the rate of complications such as stricture is 11.4% and 17.4%

compared to the URS procedure which has less than 1% complication. Besides that, a longer length of stay was associated to open procedure with an average stay of approximately four days to one week. Previously, Lezrek described that the displacement technique has always been possible in kidneys with no surgical history.⁵ However, it failed when the kidney had been fixed by postsurgical adhesions. Similar to our procedure, the subject of this procedure had no surgical history nor chronic infection which could lead to adhesion of the kidney.

There was no difference in renal movement between right and left kidneys using this technique. In the other report, Marberger described the use of a ureteral balloon catheter in the distal part of the obstruction and performed gentle traction to gain access, but this procedure put larger pressure in the ureter wall which may cause ischemic and lead to further complication.⁴

In our case, the large hydronephrosis of the patient did not influence this procedure, which different from Lezrek et al. who described that large hydronephrosis caused renal displacement was unsatisfactory.⁵ Based on a comparative study with a similar technique, the needle renal lifting technique was less invasive and quite simple to use to adjunct URS in the management of complicated ureteral stone. But in fact, this technique is complementary. The success rate of this procedure is based on the operator's skills to access the calyx and perform URS simultaneously. Same as the previous technique, needle renal lifting is effective only when the kidney is mobile.

CONCLUSION

Needle renal lifting technique can be used to adjunct URS in the management of complicated ureteral stones which prohibited access to the proximal ureter. This procedure is considered minimally invasive with minimal complications when compared with open surgical procedures. Besides, the recovery process takes place faster with a short length of stay.

REFERENCES

1. Mc Dougall EM, Liatsikos EN, Dinlenc CZ, Smith AD. Percutaneous approach to the urinary tract. In: Walsh PC, Retik AB, Vaughan ED, Wein AJ, eds. *Campbell's Urology*. 11th ed. Philadelphia: Saunders; 2016. p.98.

2. Smith AD. Difficulties of ureteral access. In Smith's Textbook of Endourology. Blackwell: Blackwell Ltd; 2012. p. 47.
3. Prakash J. Retroperitoneoscopic versus open mini-incision ureterolithotomy for upper- and mid-ureteric stones: Urolithiasis Vol.42. Springer; 2014. p. 133.
4. Marberger M. Fitzpatrick JM. Jenkins AD. Upper Urinary Stone. In stone surgery. Edinburgh: Churchill Livingstone; 1991.
—