



Functional medicine

A combination of laparoscopic ureteroplasty and flexible uteroscopic lithotripsy in the treatment of circumcaval ureter and right renal calculi: A case report

Mohamed Mohamoud Adan¹, Minbo Yan¹, Wu Xiang, Yingbo Dai^{*}

Department of Urology, The Fifth Affiliated Hospital, Sun Yat-sen University, PR China

ARTICLE INFO

Keywords:

Circumcaval ureter
Renal calculi
Uteroplasty
Flexible ureteroscopy
Case report

ABSTRACT

Patients with circumcaval ureter and right renal calculi are not often seen in the clinical practice and require special approach. Hereby we report a case of a 34-year-old male that was diagnosed with circumcaval ureter complicated by right kidney stones. Laparoscopic ureteroplasty and flexible ureteroscopic lithotripsy were implemented in the treatment of both of these entities. A combination of these approaches allowed us to perform the surgery effectively, efficiently and safely without having to do the second one.

Introduction

Circumcaval ureter (CU), also known as retrocaval ureter, is a congenital abnormality of the development of inferior vena cava (IVC), when the right ureter passes posteriorly to it. It has an extremely low prevalence of approximately 0.001% and occurs more frequently in men.¹ It is associated with various congenital malformations.² Due to the specifics of this disorder, some patients require simultaneous right renal calculi removal, and such cases are seldom found in either clinics or literature. Hereby, we present a patient diagnosed with CU and right renal calculi that successfully underwent surgery consisting of combined flexible uteroscopy and retroperitoneal laparoscopy.

Case presentation

A 34-year-old male came to our hospital following the diagnosis of CU made in the local hospital. He was asymptomatic and did not report any significant past or family history. CT scan revealed right hydronephrosis, right renal stones and CU (Fig. 1). A surgery was suggested to the patient.

The right upper ureter and IVC were mobilized. The ureter running posteriorly to the IVC was repositioned anteriorly following its complete disconnection. The utmost attention was paid to reducing amount of soft

tissue surrounding the renal pelvis and upper ureter in order to make the structure fixed and thus facilitate introduction of ureteroscope for lithotripsy. The ureter was dissected above the beak-like stricture, and ureteroscope was inserted to explore the renal pelvis and calyces. Holmium laser was used in lithotripsy. However, we discovered that renal pelvis could not be fully expanded and crushing stones completely would only damage renal pelvis mucosa, so stones were collected with a specialized basket. Double-J stent was placed, ureteral end-to-end anastomosis was performed, and, finally, perinephric drainage tube was inserted. The surgery took 115 minutes. Intraoperative blood loss was 30 ml. The patient recovered intestinal function on the 1st day after surgery. There were not any post-operative complications. Drainage tube was removed on the 3rd day after surgery. The patient was discharged on the 5th day after surgery. 1 month after discharge, double-J tube was removed. No abnormal findings were reported on follow-up.

Discussion

Some doctors choose to perform laparoscopic pyeloplasty and pyelolithotomy in the treatment of symptomatic CU with right kidney stones.³ However, one of the main disadvantages of this procedure is the necessity of opening renal pelvis and limited exploration of renal calices leading to excessive hemorrhage, longer operation time and unnoticed

Abbreviations: CU, circumcaval ureter; IVC, inferior vena cava; CT, computed tomography.

*** Corresponding author. Department of Urology, the Fifth Affiliated Hospital, Sun Yat-sen University, No. 52, Meihua East Road, Xiangzhou District, Zhuhai, Guangdong, 519000, PR China. Tel.: +86 0756 2528679.

E-mail address: daiyingbo@126.com (Y. Dai).

¹ Adan MM and Yan MB contributed equally to this article first author.

<https://doi.org/10.1016/j.eucr.2021.101609>

Received 13 January 2021; Received in revised form 8 February 2021; Accepted 13 February 2021

Available online 17 February 2021

2214-4420/© 2021 Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

residual stones. Only several reports described a surgery in patients with CU complicated by kidney stones, but only renal calculi were treated rather than CU or both.^{4,5}

To our knowledge, the surgery we performed has never been reported. In addition, it is somewhat unique in terms of procedure. Firstly, we completely disconnected the ureter in order to achieve dilation of the proximal end of the ureter. Secondly, by disconnecting the ureter and reducing tissue surrounding renal pelvis and proximal ureter steps, ureteroscope insertion into the pelvis requires less effort (we did it within 1 minute). Also, ureter disconnection can prevent the stone from falling into middle and lower portions of ureter. Finally, in our case, crushing stones completely with laser would only lead to damage of renal pelvis mucosa. Luckily, the patient was deemed feasible for large stone removal because of dilated proximal ureter. So, we first crushed stones using high energy and low frequency lithotripsy and then removed the remaining fragments. Not only this method can reduce amount of residual stone fragments, but also increase efficiency and reduce operation time. Lithotripsy was done in 15 minutes, and no stones were found postoperatively.

Conclusion

In conclusion, laparoscopy combined with ureteroscopy is safe in the treatment of CU with right renal stones. Its effectiveness, efficiency, high stone removal rate, minimal trauma and fast postoperative recovery make it worthy of advocating. The patient reported their condition as satisfactory and did not complain of any symptoms.

Ethical approval

This study was approved by the local ethics committee.

Consent for publication

Written informed consents were obtained from the patient for publication of this case report and any accompanying images.

Availability of data and materials

Not applicable.

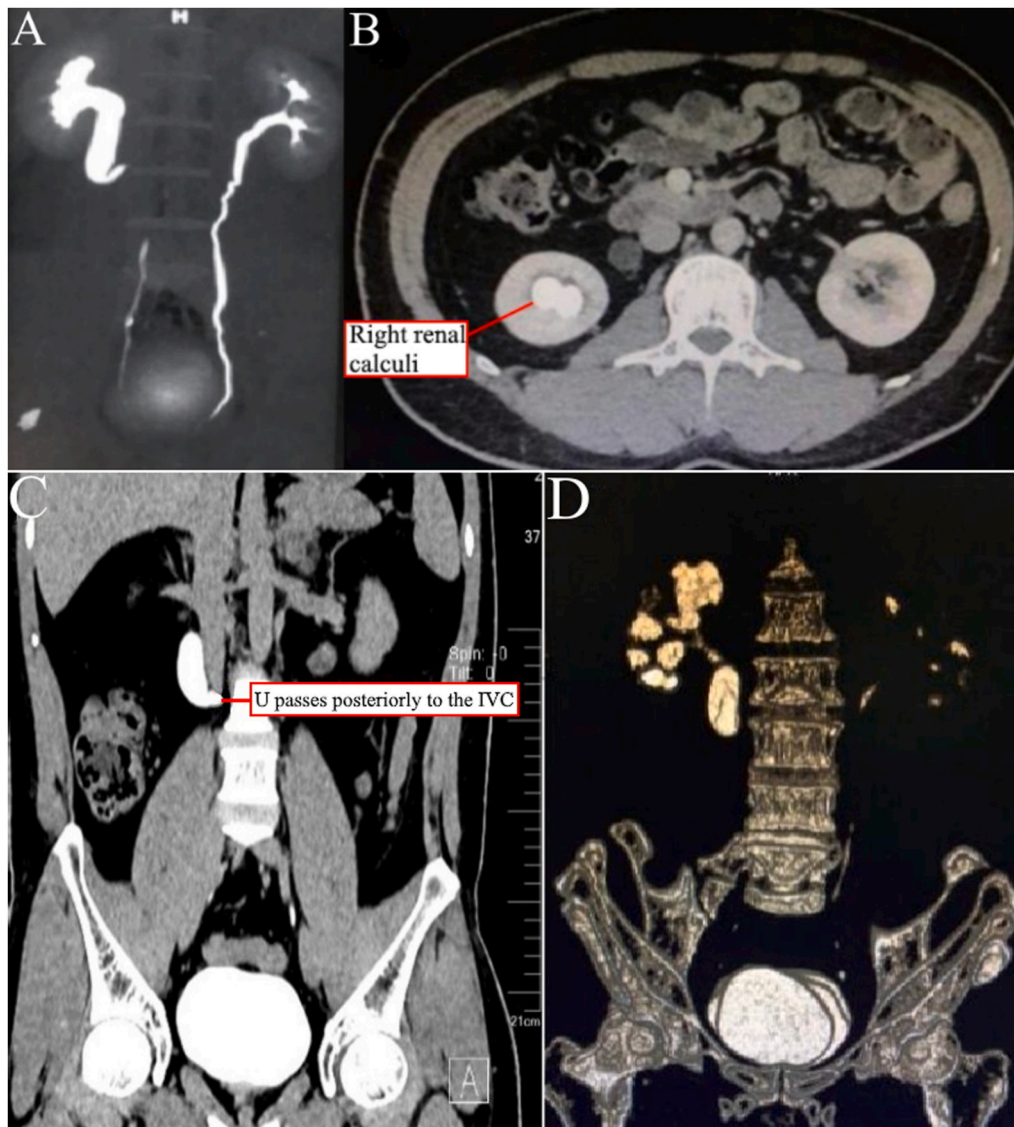


Fig. 1. A. CTU scan B. CT scan C. CTU scan D. 3D model.

Funding

None.

Authors' contributions

Adan MM – Formal analysis, Investigation, Writing - original draft, Writing - review & editing.

Yan MB – Methodology, Project administration, Resources, Software, Validation, Visualization, Writing - review & editing.

Wu Xiang – review & editing

Dai YB – Conceptualization, Data curation, Funding acquisition, Supervision.

Declaration of competing interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

Acknowledgement

None.

References

1. Hostiuc S, Rusu MC, Negoii I, et al. Retrocaval ureter: a meta-analysis of prevalence. *Surg Radiol Anat.* 2019;41:1377–1382. <https://doi.org/10.1007/s00276-019-02269-w>.
2. Perimenis P, Gyftopoulos K, Athanasopoulos A, et al. Retrocaval ureter and associated abnormalities. *Int Urol Nephrol.* 2002;33(1):19–22. <https://doi.org/10.1023/a:1014436432109>.
3. Ramakumar S, Lancini V, Chan DY, et al. Laparoscopic pyeloplasty with concomitant pyelolithotomy. *J Urol.* 2002;167(3):1378–1380.
4. Guttilla A, Fiorello M, Fulcoli V, et al. A case of retrograde treatment of a ureteral stone in a retrocaval ureter. *J Endourol Case Rep.* 2018;4(1):198–200. <https://doi.org/10.1089/cren.2018.0061>.
5. Prakash J, Raj A, Sankhwar S, et al. Renal calculi with retrocaval ureter: is percutaneous nephrolithotomy sufficient? *BMJ Case Rep.* 2013;2013, bcr2013008889. <https://doi.org/10.1136/bcr-2013-008889>.