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Stones in hydrocalyx: Endoscopic treatment in a complex case

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Introduction

Hydrocalyx is a rare cause of lumbar pain. The Fraley syndrome is described as the presence of a symptomatic hydrocalyx of the renal upper pole due to vascular compression. Persistent pain in patients with middle or inferior obstructed calyces is also reported in case reports. The most common treatment for hydrocalyx is surgery with caliceal plasty or calycectomy with surgical repair of the collecting system or in selected cases partial nephrectomy with open or minimally invasive technique. Recent technological improvements has made intrarenal flexible endoscopy a feasible alternative to surgery, with the aim to reduce complications and allow a faster recovery.

Materials and methods

A 27 years old woman came to our attention for persistent right lumbar pain without fever and hematuria. She underwent a right retrograde intrarenal surgery for renal stones 2 years before.

At US two large stones were seen in the right middle calyx with no hydronephrosis.

The contrast-enhanced CT scan showed two 15 mm and 7 mm stones in dilated middle calyces with an obliterated common infundibulum.

The patient was counseled about the treatment options and a repeat endoscopic retrograde intrarenal surgery was planned. A semirigid ureteroscopy was performed without pathological findings. A ureteral sheath was placed and a flexible ureteroscope was inserted. The two stones were clearly visible at fluoroscopy. At first endoscopic exploration of the renal cavities no stone fragments were found and the obstructed infundibulum was not visible. A retrograde pyelogram showed signs of contrast around the larger stone.

Under fluoroscopic guidance an incision of the mucosal flap occluding the calyceal collar was made with a 200 nm Holmium laser fiber. After incision the larger stone in the hydrocalyx was visualized and fragmented with 0,4 J at 80 Hz (32W), short pulse. The second stone was located in a more anterior calyx with a very thin collar. The collar was incised and the stone was dislocated in the larger calyx allowing a complete fragmentation. After lithotripsy a retrograde pyelogram showed no contrast leakage. A double J stent was placed.

Results

Total operative time was 120 minutes. The patient was discharged in POD 1. The JJ ureteral stent was removed after 45 days. CT scan after stent removal showed a complete stone clearance. At the time of this report the patient is asymptomatic without lumbar pain.

Conclusions

Only few papers discuss surgical treatment of hydrocalyx. Most of them describes etiology and pathophysiology of Fraley syndrome. In this cases caliceal surgery was the preferred technique. Some case reports describe treatment of acquired hydrocalyx (an uncommon complication of intrarenal surgery or percutaneous renal surgery) with laparoscopy or interventional radiology. In 2000 Wolf [1] described laparoscopic management of hydrocalyx where the portion of parenchyma drained by obstructed calyx was selectively removed and the excretory system was closed. In his work the author suggest to use the laparoscopic technique when the hydrocalyx in anterior, when a percutaneous or endoscopic approach is possible, when drained parenchyma is small or large stones are present inside the calyx. In this paper the outcomes of laparoscopic treatment were good but few cases were described. In 1994 Bellman et al. [2] described a single case report of a post-traumatic hydrocalyx treated with percutaneous access and incision of the collar to re-establish communication with the renal pelvis. One month after surgery the collar of the calix was still open and renal parenchyma was well drained. In 2020 Santiapillai and Agrawal [3] described the combined endoscopic and percutaneous treatment of intrarenal cyst causing caliceal obstruction and pseudo hydrocalyx with stone inside. A

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laparoscopic approach was initially planned but the presence of difficult perinephric fat and multiple crossing vessels led the authors to abort the procedure. The authors decided to perform an endoscopic and percutaneous access to drain the cyst and to treat stones in the obstructed calyx. The procedure was perfomed by urologists and interventional radiologists and good results were reported at one year follow-up with no residual stones or hydrocalyx. The endoscopic and percutaneous approach seems to be safe and effective to treat this rare disease. In 2020 Chopra et al. [4] described 2 cases of creation of neoinfundibulum to hydrocalyx with successive balloon dilatation of the infundibulum. The procedure was performed with two percutaneous accesses; the continuity of the infundibulum with renal cavities was reestablished using a stiff guidewire with sharp technique. On this guidewire a dilation balloon was passed and used to widen the infundibulum. This technique was inspired by sharp treatment of vascular occlusions. Otherwise, the use of radiofrequency needle to recreate the calical infundibulm was used. The authors recommended to perform serial balloon dilatations monthly for 6 months after procedure to obtain better results. This technique requires highly-experienced interventional radiologist to prevent complications. A long term follow-up is needed to confirms results. No papers in literature describes the endoscopic-only treatment of hydrocalices.

Treatment of stones in hydrocalices is challenging and generally requires surgical treatment.

This case shows how the endoscopic approach guided by fluoroscopy is feasible and effective in selected cases and can achieve a complete stone clearance also when the calyceal infundibulum is not visible or very narrow. In centers with significant expertise in the treatment of renal stones, patients with a symptomatic hydrocalyx should be counseled about all treatment options including endoscopic intrarenal surgery.

Informed consent was signed by the patient.

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Disclosure

I, Gianmarco Bondonno, MD, Certified Urologist, declare that have obtained signed consent from the patient of case to publication of this case.

The video related to this article can be found online at: doi:10.1016/j.urolvj.2021.100098.

Declaration of Competing Interest

None

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