Successful laparoscopic management of hydroperitoneum- a rare complication of retrograde intra renal surgery (RIRS).

ABSTRACT :

Although urolithiasis has many treatment options, every treatment has its own complications. In this case report , we discuss about a 36yr old female who was being treated for lower calyx stone by retrograde intrarenal surgery (RIRS) technique and developed hydroperitoneum post proceedure. Patient developed abdominal compartment syndrome and it was managed immediately postoperatively by laparoscopic intraperitoneal drainage of the collection.

KEYWORDS: abdominal compartment syndrome, hydroperitoneum,

ABBREVATIONS : RIRS , CT KUB, OPD

INTRODUCTION:

Urolithiasis is one of the most common diseases with an increasing global incidence. The management of the renal and the proximal ureteral calculi has evolved during the last few decades.

With the advances in flexible endoscopy, reduction in scope size, improved scope durability, improved light transmission, extended field of vision, and efficacious lithotripsy technology, the RIRS has become widely accepted and employed as the first-line treatment for the upper urinary tract stones of less than 2 cm [1,2]

RIRS has lower complication rates and high stone-free rates [3,4]. Most of the RIRS complications were in the lower Clavien grades and major complications were uncommon [6]. Intraoperative and postoperative complications were observed in 5.9% and 7.3% of patients.

In this case report, we describe immediate successful laparoscopic management of hydroperitoneum, which is one of the rare postoperative complications following RIRS.

CASE REPORT:

A 36-year-old female presented to urosurgery OPD with complaints of right flank pain. CT KUB was suggestive of right lower pole calculus of size 12.6 mm with Hounsfield unit of 900, with both kidneys functioning normally.

She was posted for retrograde intrarenal surgery for the above findings. Intraoperatively, cystoscopy was done with right ureteral cannulation with guide wire and dilated. A 10/12Fr ureteric access sheath passed under C-arm guidance. 7.5fr flexi RIRS scope was passed under vision through access sheath to reach up to renal pelvis. Flexiscope was angled to visualize the lower calyx stone and with the help of holmium laser (0.85J, 10Hz), lithotripsy was done and pressure irrigation was done to remove stone fragments. There was no evidence of bleeding. A 6/26 DJ stent was placed.

Procedure was uneventful and patient was shifted to recovery postop.

Patient developed acute severe pain in abdomen while in recovery. On examination patient had pulse rate-110, with decreased saturation of oxygen up to 80%, ABG showed acidosis. Patient had abdominal tenderness and guarding. Patient had developed abdominal compartment syndrome and hence was immediately taken to operation theatre and decision was taken to go ahead with diagnostic laparoscopy to know the cause. After induction, 10 mm umbilical trocar was inserted with open technique, for camera with intra-abdominal pressure of 12mm Hg. Since patient had intra-abdominal pressure of 22mm Hg hence insufflation was not possible. Hence the pressure was increased up to 22mm Hg. Even with such high pressures, there was no space in intra-abdominal cavity hence blunt dissection done with the scope along the right paracolic gutter near the hepatic flexure following which water was seen seeping from the retroperitoneum into the intra-abdominal cavity which created some space. There was no blood in peritoneal or retroperitoneal cavity. With the same pressures, two 5mm trocar inserted in epigastrium and left iliac fossa and with forceps and suction all the fluid within the peritoneum, drained. The pressures lowered gradually to 12 mm Hg and approximately 2 L of fluid was drained. A Jackson Pratt drain was inserted in the right paracolic gutter and was kept for a period of 2 days which was draining 100-200 ml per day.

Postoperatively patient was stable and discharged on day 3 post-op after drain removal.

IMAGES:

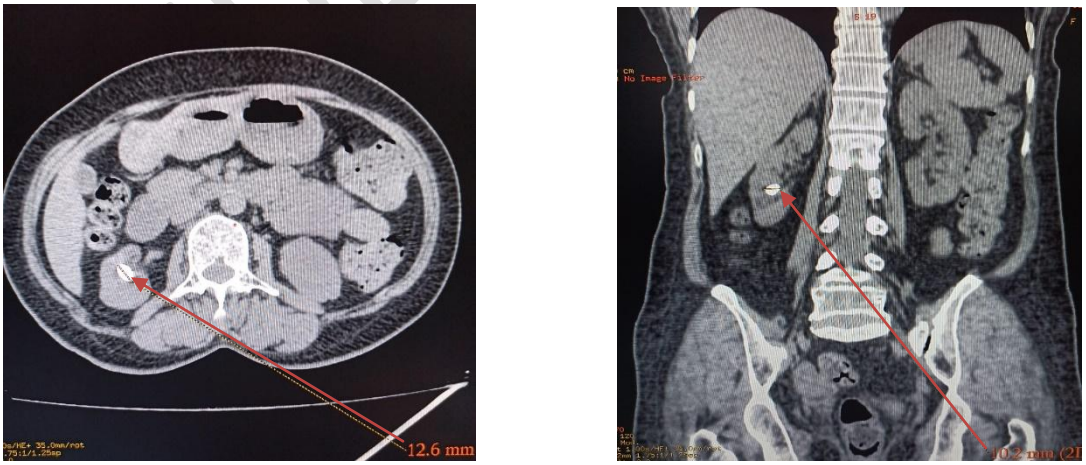

Fig 1: CT KUB (plain) showing right lower calyx stone.

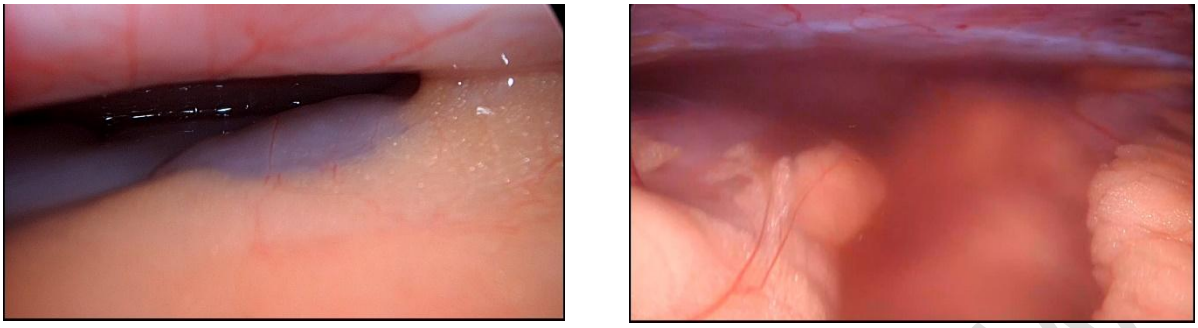

Fig 2: Hydroperitoneum at intra-abdominal pressures of 22mm Hg

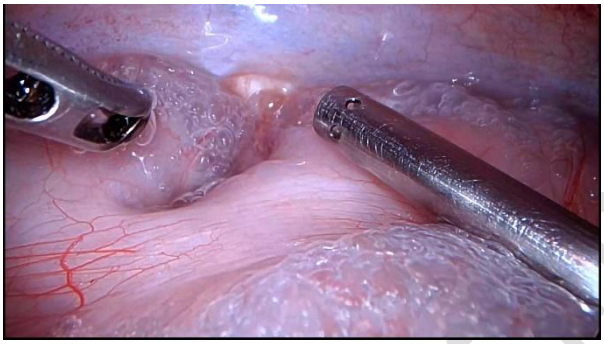

Fig 3: Trocar insertion with suction draining of hydroperitoneum.

DISCUSSION:

Urolithiasis is one of the reasons for increased number of hospital visits. The lifetime risk of urolithiasis in the general population is 13% in men and 7% in women [7]. RIRS is the most popular treatment in patients with renal stones smaller than 2 cm. RIRS has shown stone-free rates comparable to other therapeutic modalities and with a lower risk of renal damage and bleeding [8,9]. After first treatment, stone-free rate achieved is 81.9% and is about 87.4% after a second procedure [5]

Breda et al. reported that the overall complication rate for RIRS was 8% and the rate of major complications was 1.9% [10]. Fever in the postoperative period was the most common individual complication [11,12]. Sepsis was the most severe complication [13]. Hydroperitoneum is an unusual complication with only two cases reported so far [14]. Positioning of an abdominal drain under CT or ultrasound guidance was done which led to rapid resolution of symptoms in two days [14]

Our patient had lower calyx stone and, lower pole stones can be reached more difficultly compared to middle and upper pole stones due to the anatomy. Also, there is limited spontaneous drainage of stone fragments after lithotripsy due to the position of lower pole. The cause of hydroperitoneum is probably due to seepage of fluid from the lower calyx following pressure irrigation. Patient was treated

immediately post-operative due to development of abdominal compartment, with laparoscopic drainage of intra-abdominal fluid and placing an abdominal drain to drain any fluid that drains from the retroperitoneum into intraabdominal compartment.

CONCLUSION:

Although RIRS is a minimal invasive procedure in the treatment of renal calculi, it is not free of complications. Early recognition of any postoperative complication and its immediate management is of crucial value.

DECLARATIONS:

1. Funding: Not applicable
2. Conflict of interest: Not applicable
3. Code availability: Not applicable

BIBLIOGRAPHY:

1. Zheng C, Xiong B, Wang H, Luo J, Zhang C, Wei W et al (2014) Retrograde intrarenal surgery versus percutaneous nephrolithotomy for treatment of renal stones > 2 cm: a meta-analysis. Urol Int 93:417–424
2. Mahmood, S.N., Babarasul, M.H., Fakhralddin, S.S. *et al*. Retrograde intrarenal surgery for the treatment of renal stones in patients with a solitary kidney: Does access sheath matter? *Afr J Urol* **27,** 35 (2021).
3. Giusti G, Proietti S, Cindolo L, Peschechera R, Sortino G, Berardinelli F et al (2015) Is retrograde intrarenal surgery a viable treatment option for renal stones in patients with solitary kidney? World J Urol 33(3):309–314
4. Kuroda S, Fujikawa A, Tabei T, Ito H, Terao H, Yao M et al (2016) Retrograde intrarenal surgery for urinary stone disease in patients with solitary kidney: a retrospective analysis of the efficacy and safety. Int J Urol 23(1):69–73
5. Scoffone CM, Cracco CM, Cossu M, et al. Endoscopic combined intrarenal surgery in galdakao-modified supine Valdivia position: A new standard for percutaneous ne-phrolithotomy? Eur Urol 2008; 54:1393–1403.
6. Xu Y, Min Z, Wan SP, Nie H, Duan G. Complications of retrograde intrarenal surgery classified by the modified Clavien grading system. Urolithiasis. 2018 Apr;46(2):197-202.
7. Lin KJ, Lin PH, Chu SH, Chen HW, Wang TM, Chiang YJ et al (2014) The impact of climate factors on the prevalence of urolithiasis in Northern Taiwan. Biomed J 37:24–30

8. Ramon de Fata F, Garcia-Tello A, Andres G, Redondo C, Meilan E, Gimbernat H et al (2014) Comparative study of retrograde intrarenal surgery and micropercutaneous nephrolithotomy in the treatment of intermediate-sized kidney stones. Actas Urol Esp 38:576–583
9. Alkan E, Avci E, Ozkanli AO, Acar O, Balbay MD (2014) Same session bilateral retrograde intrarenal surgery for upper urinary system stones: safety and efficacy. J Endourol 28:757–762
10. Breda A, Angerri O (2014) Retrograde intrarenal surgery for kidney stones larger than 2.5 cm. Curr Opin Urol 24:179–183
11. Oguz U, Resorlu B, Ozyuvali E, Bozkurt OF, Senocak C, Unsal A (2014) Categorizing intraoperative complications of retrograde intrarenal surgery. Urol Int 92:164–168
12. Sabnis RB, Ganesamoni R, Doshi A, Ganpule AP, Jagtap J, Desai MR (2013) Micropercutaneous nephrolithotomy (microperc) vs retrograde intrarenal surgery for the management of small renal calculi: a randomized controlled trial. BJU Int 112:355–361
13. Shoshany O, Margel D, Finz C (2015) Percutaneous nephrolithotomy for infection stones: what is the risk for postoperative sepsis? A retrospective cohort study. Urolithiasis 43:237–242
14. Benincasa A, Nicolosi F, Falsaperla M, Saita A. Hydroperitoneum: A Rare Complication Performing Endoscopic Combined Intrarenal Surgery. Journal of Endourology Case Reports. 2016 ;2(1):55-58.