

Multiple Calculi and Clear Cell Carcinoma in Same Kidney Rare Condition with Remarkable Implications for Surgery

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Received date: November 09, 2022; Accepted date: December 18, 2022; Published date: January 10, 2023.

Citation: Henry K. YISA, Yun F. LIAO, Guo X. ZHANG, Liu L. WEI. (2023). Multiple Calculi and Clear Cell Carcinoma in Same Kidney Rare Condition with Remarkable Implications for Surgery, *Journal of Clinical Research and Reports*, 13(1) DOI:10.31579/2690-1919/283.

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Abstract:

The main risk factors are tobacco smoking, obesity, hypertension, horseshoe kidneys, acquired renal cysts and genetic factors especially von Hippel Lindau disease (VHL).

Key Words: right kidney; laparoscopic; Right renal; lower pole; renal tumour

Introduction

Clear cell renal cell carcinoma (ccRCC) is the most primary renal malignancy in adults with an incidence of 0.04% in the general population [1]. The main risk factors are tobacco smoking, obesity, hypertension, horseshoe kidneys, acquired renal cysts and genetic factors especially von Hippel Lindau disease (VHL) [2]. The aetiology of ccRCC is linked to a loss of the short arm of chromosome 3 and the tumor arises from the proximal tubules. Microscopically, it has a clear cytoplasm and a low nuclear/cytoplasmic ratio, the cytoplasm is filled with glycogens and lipids which dissolves during tissue processing resulting in a clear cytoplasm.

With respect to the concomitant existence of a clear cell carcinoma and calculus in the same kidney, only 7 previous cases have been reported in the world literature [3]. In all cases, the tumor was identified at the time of open renal exploration to remove the calculus. In each patient, a total nephrectomy was performed instead of the calculus-removing, nephron-sparing procedure [4]. No underlying etiology to account for the coexistence of the calculus and ccRCC has been identified [5]. The patient reported on herein is unique in that the renal cell carcinoma was diagnosed prior to treatment. Instead of undergoing a percutaneous nephrolithotomy in which the nephrostomy tract could have gone through the tumor, a robot assisted laparoscopic partial nephrectomy was performed first, followed three months later by a two-stage flexible ureteroscopy lithotripsy (FURL).

Case

Level of evidence: 4

A 59-year-old man with a BMI of 28.8kg/m² who was admitted in the hospital for 2 weeks due to intermittent right flank pains for 3 months, a known hypertensive, treated for pulmonary tuberculosis 5 years ago, a chronic smoker, 2-3 packs / day (60-90 pack years), no family history of renal disease, no previous history of abdominal or pelvic surgery. Non contrast CT KUB showed that the right kidney had multiple stones and hydronephrosis, the largest measuring 3cm in diameter. CT contrast revealed a tumor in the lower pole of the right kidney measuring 2.5cm in length with a strong suspicion of a renal carcinoma. A robot assisted suprapubic single port laparoscopic partial nephrectomy was done first followed by a two staged flexible ureteroscopy lithotripsy (FURL) three months later. During the robot assisted operation, the advantages of flexibility and precision of robot arm were fully exploited, the renal artery was not clamped and the tumor was completely excised under zero ischemia. The operation time was about 40 minutes. Blood loss during the operation was about 100 ml. The vital signs were stable after the operation. Histopathology results showed clear cell renal carcinoma with tumor negative margins. After a full recovery of this patient after three months a two staged FURL was done with a one-week free interval between the two sessions, a 100% stone free rate was achieved and further stone analysis revealed a Calcium oxalate stone.



Figure 1: XRAY- KUB showing multiple right renal calculi

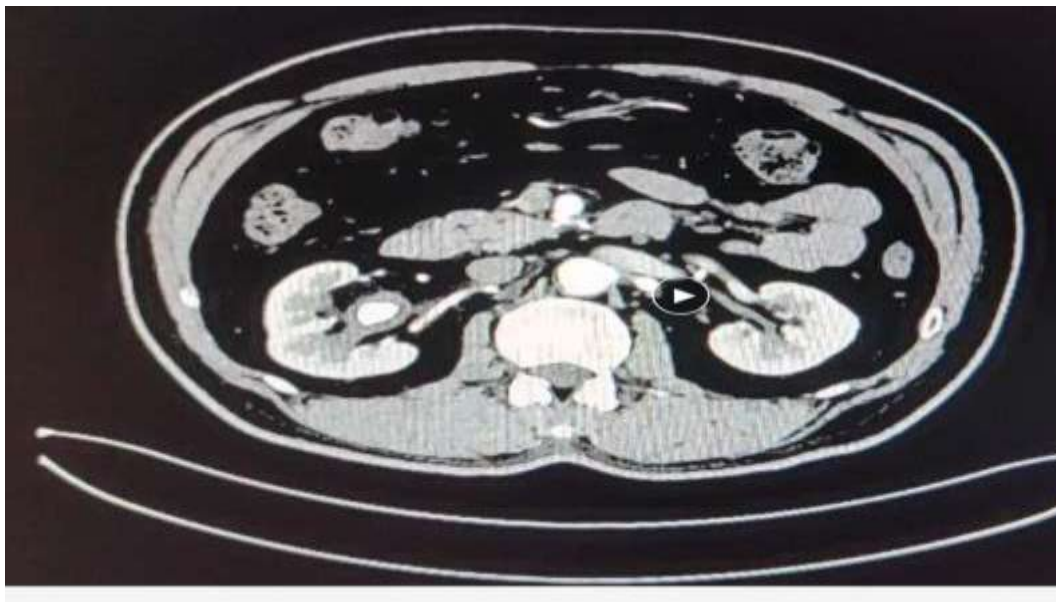


Figure 2: Abdominal CT Showing multiple right renal calculi

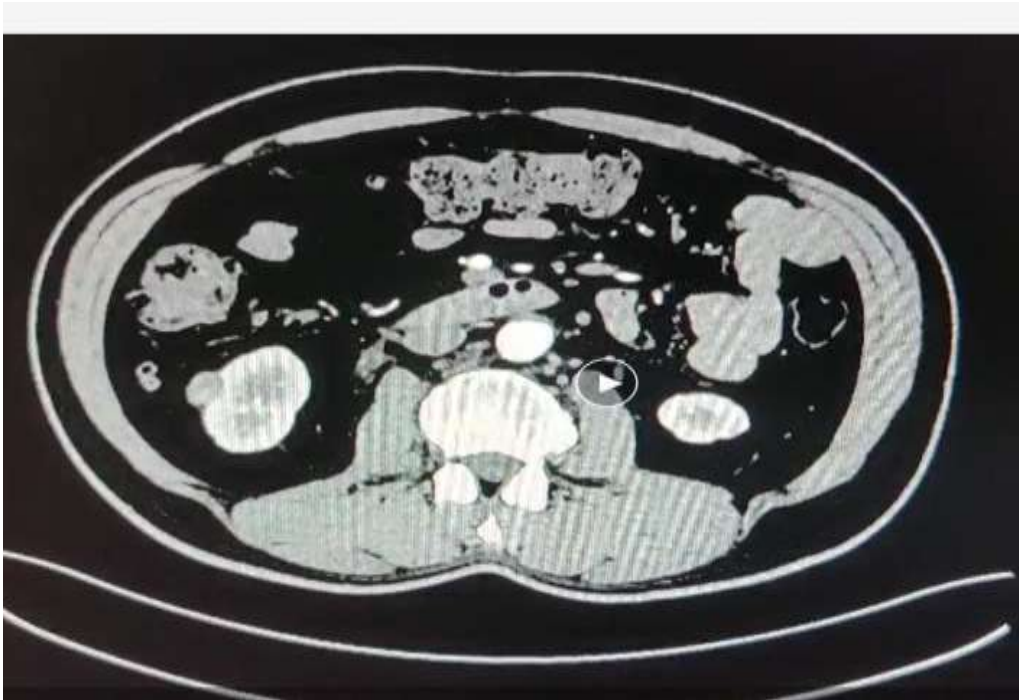


Figure 3: CT right kidney showing a renal tumor in the lower pole



Figure 4: Port position for robot assisted laparoscopic partial nephrectomy



Figure 5: *Intraoperative findings during robot assisted laparoscopic partial nephrectomy*



Figure 6: *Right renal lower pole after excision of renal tumor*



Figure 7: Excised renal tumor with a wide margin

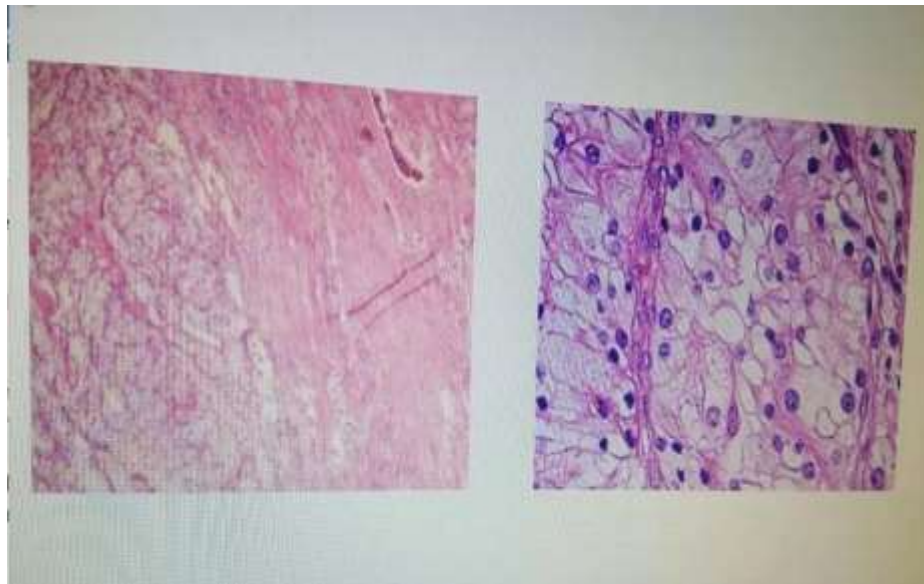


Figure 8: Histopathology results of resected tumor revealing clear cell renal cell carcinoma

Discussion

Patients beyond the fifth decade with a renal calculus have an increased likelihood of a coexisting malignancy and, as a result, should be carefully evaluated by critically evaluating the renal parenchyma before treatment of calculus especially PCNL to avoid dissemination of a renal malignant tumor and to prevent hematoma. If a tumor is suspected, further investigations should be carried out, a contrast computed tomography (CT), and/or magnetic resonance imaging (MRI) should be done. The concomitant presentation of a small renal mass with stone disease is uncommon, with an incidence of 3% but when it occurs it presents a treatment challenge especially in deciding which pathology that should be managed first. In this particular case the tumor was first excised through a robotic assisted laparoscopic partial nephrectomy without clamping of the renal artery followed by a staged flexible ureteroscopy lithotripsy resulting in a favorable outcome.

Conclusion

In conclusion, the concomitant existence of a CCRCC with multiple calculi in the same kidney is very rare but when it occurs careful evaluation is paramount in deciding which pathology to manage first, it is safe and successful to do a laparoscopic partial nephrectomy followed by a flexible ureteroscopy lithotripsy.

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DOI: [10.31579/2690-1919/283](https://doi.org/10.31579/2690-1919/283)

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