

Oncology

Surgical management of a locally invasive renal cell carcinoma in an ectopic pelvic kidney

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ABSTRACT

The coincidence of renal cell carcinoma in an ectopic kidney is a unique phenomenon. We report a case of 55 years old male patient who presented with backache and accidentally discovered ectopic kidney with an upper polar mass. Preoperative assessment was done with pelviabdominal sonography and triphasic renal CT. Our patient underwent radical nephrectomy through a midline incision with unexpected vasculature encountered intraoperatively. According to our knowledge, only eight cases of pelvic kidney tumors have been reported in the literature and this case is unique with its complex vascular structure.

Introduction

Renal ectopia results from failure of ascent of the normal embryonic kidney which may arise as a result of abnormality in the metanephros that fails to induce the ascent, urinary bladder maldevelopment, genetic, maternal illness or teratogenic causes. According to site the kidney may be pelvic which is the most common, iliac, abdominal, and thoracic or crossed sided. The report incidence is 1:900 and equally represented in both sex.¹

Compared to a normally situated kidney an ectopic one is no more susceptible to disease other hydronephrosis development or urinary calculi. However, such embryological anomaly has a complex vascular network depending on the kidney's position.¹

Renal cell carcinoma is the most common solid tumor occurring within the kidney representing 2–3% of all adult malignant. However, the incidence of renal cell carcinoma in a pelvic kidney is rare, and has only been described in a very small number of cases^{2–4}

Nevertheless, when considering surgical approach to an ectopic kidney especially with an intention to resect a tumor, a detailed imaging study with accurate vascular anatomy evaluation is mandatory to avoid unnecessary damage to blood vessels or leaving remnants of tumor within the patient.

Case report

A 55 years old male patient was referred to our clinic from the orthopedic department complaining of low backache of one-month duration and accidentally discovered renal mass in a left ectopic kidney which is not associated with any urological symptoms. The patient's past surgical history is irrelevant, his physical examination revealed a non-tender paraumbilical swelling and tenderness over the lumbar spine and paravertebral muscles. Abdomin-pelvic sonography shows a left ectopic kidney with an upper polar soft tissue lesion. triphasic renal CT shows an ectopic left kidney with an upper polar irregular exophytic focal lesion measuring 5 × 4 cm encasing the Aorta with no line of separation between them with more than 50% of aortic circumference is involved as well as involvement of inferior mesenteric artery and stranding of surrounding fat planes with direct arterial supply from the Aorta in addition to the left renal artery which arise more distal from the Aorta with a patent renal vein with no evidence of invasion (Fig. 1).

The patient underwent radical nephrectomy through a midline incision trans-peritoneal approach with a careful meticulous dissection. Ectopic kidney was identified with an upper polar mass adherent to the Aorta with no line of separation in-between and adherent as well to vertebral column posteriorly, regarding the vasculature of the ectopic kidney and the upper polar mass, many parasitic vessels were encountered in addition to the already pre-operatively known 2 main supply, 1 vessel from left external iliac, 2 vessels from the left common iliac, 1

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Fig. 1. (arrows refers to the blood supply to an ectopic kidney as shown by CT angiograph).

from the right common iliac and 2 branches other than the main left renal artery from the aorta. All feeding vessels were successfully ligated with no significant bleeding or vascular injury and the specimen was removed leaving the adherent part on the anterior surface of the Aorta (Fig. 2). The tumor was confirmed to be a high-grade renal cell carcinoma with focal sarcomatoid differentiation, Fuhman nuclear grade G3 with lymphovascular invasion and invasion of the perinephric fat (Fig. 3).

Discussion

Renal cell carcinoma is a rare phenomenon in an ectopic kidney. According to our knowledge only eight cases were reported in the literature.³ It was evident that this is the first case of renal cell carcinoma of an ectopic pelvic kidney with an uncommon presentation of backache in addition to the abnormally multiple vascular supply that being surgically adherent to the aorta and the vertebral column. The surgical approach to an ectopic kidney merits caution with meticulous dissection due to their bizarre vascular anatomy. Triphasic renal CT was done in our case showing 2 main blood supply arising from the descending Aorta and tumor mass encroaching anterior surface of the Aorta and inferior mesenteric artery. However, we encountered during surgery other parasitic vessels one from the external iliac, two vessels from the left common iliac, one from the right common iliac and 4 branches from the descending aorta 2 of them are major vessels that were already known by our imaging studies. Taking in consideration the abnormal anatomy and vascular supply of the ectopic kidney, it is indispensable to have a detailed preoperative vascular anatomy evaluation and to anticipate inadequately investigated parasitic vessels during surgical dissection.

Izadpanahi et al., mentioned the use of 64-slice CT and 3D-CT

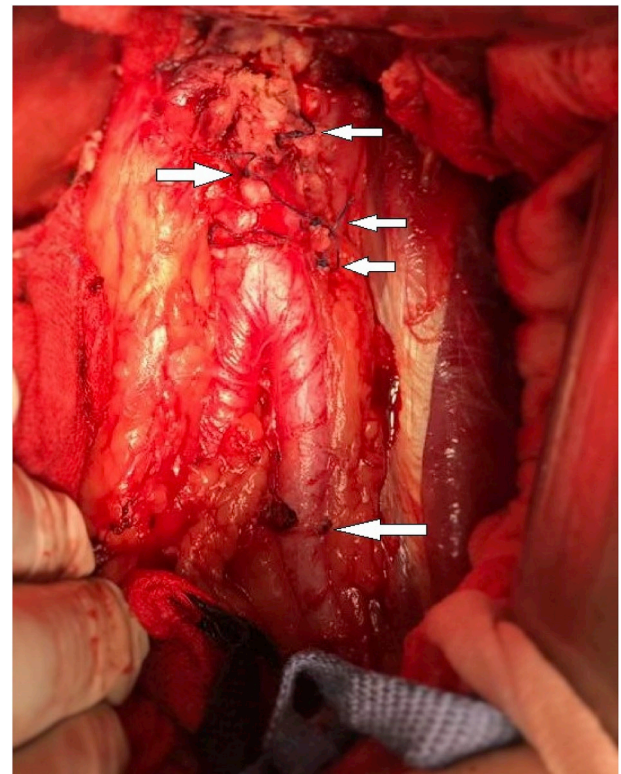


Fig. 2. (arrows refers to ligated feeding vessels from tumor bed).

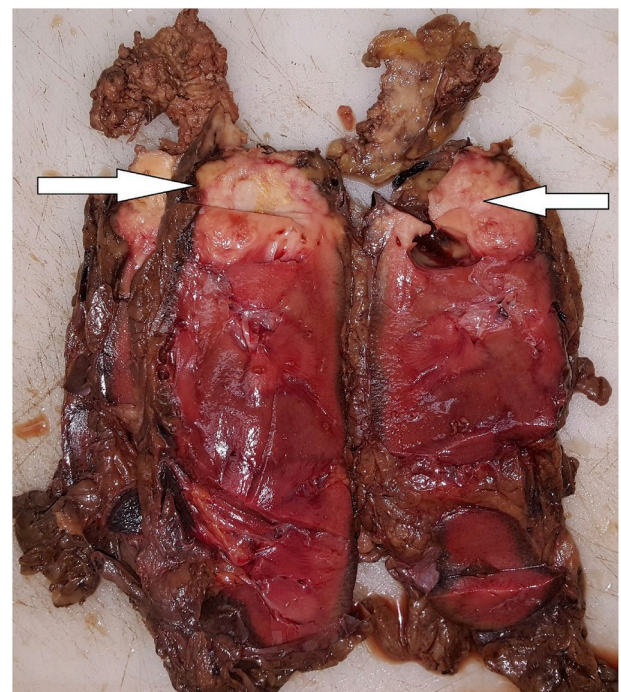


Fig. 3. (arrows refers to the renal mass in the resected kidney).

angiography to be an ideal, non-invasive modality that clearly showed the anatomy of the pelvic kidney, its relation to the surrounding in addition to the vascular supply of the kidney as shown by 3D-CT angiography that was confirmed during surgery.²

Other study recommends magnetic resonance angiography (MRA) as an alternative for angiography in detecting renal vessels prior to surgical

resection, Terrone et al., adopted MRA for pelvic RCC as a diagnostic procedure and suggested a superiority compared to CT angiography in identifying renal vessels.⁴

Conclusion

To our knowledge this is the first case of ectopic kidney with a locally invasive renal cell carcinoma adherent to the descending aorta with such a complex vasculature. In order to avoid any unpredictable event intraoperative, it is recommended to have a detailed imaging study to prevent vascular injuries and ensure complete resection.

References

1. McDougal WS. *Campbell-walsh Urology Tenth Edition Review*. Philadelphia, PA: Elsevier/Saunders; 2012.
2. Izadpanahi MH, Kabiri M, Mazdak H, Nouri-Mahdavi K, Khorrani MH. Preoperative evaluation of pelvic kidney renal cell carcinoma with 64-slice CT and 3D-CT angiography. *Adv Biomed Res*. 2014;3. India.
3. Tanwar HV, Wagaskar VG, Fernandes G, Patil B, Patwardhan SK. *Surgical Management of Ectopic Kidney with Bilateral Iliac Vein Invasion*. 10. 2016:3–4, 3.
4. Terrone C FD, Destefanis P, Fiori C, Savio D. "Renal Cell Cancer in Presacral Ectopic Kidney : Preoperative Diagnostic,". 2004:174–175.