

Renal Cell Carcinoma in Horse Shoe Kidney – A Rare Case Report with Review of Literature

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Abstract

Renal cell carcinoma in horse shoe kidney is a rare disease. Only around 200 such cases have been reported in literature. Because of associated vascular anomalies surgery for tumour in horse shoe kidney is usually complicated. We are reporting a case of renal cell carcinoma in horse shoe kidney with inferior vena cava thrombosis from a tertiary cancer centre in eastern India.

Keywords: Renal cell carcinoma, Horse shoe kidney, Clear cell carcinoma

Introduction

Horse shoe kidney is a renal fusion anomaly affecting approximately 1 in 400 live births. Patients are mostly asymptomatic and this anomaly is usually found incidentally during imaging studies carried out for other reasons. But symptoms may arise when hydronephrosis, infection, or calculus forms in horse shoe kidney. We are reporting a case of renal cell carcinoma (RCC) in horseshoe kidney.

Case Report

54 year old male patient presented to us with haematuria. Examination findings were within normal limits. Blood investigations are within normal limits. CECT (fig 1) was suggestive of a solid renal mass involving the right moiety of a horse shoe kidney in the lower pole with tumour thrombus in the right renal vein extending to the infra hepatic inferior vena cava (IVC). There was no evidence of other metastasis. After optimizing the patient, he was taken up for surgery. Intra operative findings were suggestive of a horse shoe kidney with isthmus at the level of the IMA origin with a large tumour of size 7 x 6 cm involving the lower pole of the right kidney

extending till the isthmus (fig 2). There were three right renal arteries and five right renal veins-each having separate origins from aorta and separate drainage into the IVC. Open right radical nephrectomy and isthmusectomy of horse shoe kidney with Mayo level 1 IVC thrombectomy was performed. Post-operative period was uneventful and he was discharged on post-operative day 6. Histopathology report was suggestive of grade 2 clear cell renal cell carcinoma. Post procedure follow up of 6 months patient is doing fine.

Discussion

Horse shoe kidney is a fusion anomaly of the kidneys affecting approximately 1 in 400 live births. The anomaly consists of two distinct renal masses lying vertically on either side of the midline in retro peritoneum and connected at their respective lower poles by a parenchymatous isthmus. The isthmus is located adjacent to L3 or L4 vertebra just below the origin of inferior mesenteric artery. Horse shoe kidney is more commonly found in males and male female ratio is slightly more than 2:1. Patients are often asymptomatic and it is usually identified

incidentally. When hydronephrosis, calculus or infection develops in a horse shoe kidney, it becomes symptomatic¹.

The risk of developing cancer in a horse shoe kidney is similar to the normal kidneys². In the world literature, approximately 200 cases of tumours developing in horse shoe kidneys have been described. Most common among them were RCC³. The incidence of renal cell carcinoma in horseshoe kidney is predicted to be approximately 5.2/100000 individuals⁴. Most of these malignancies were arising from isthmus of horse shoe kidney⁵, and the majority of these were of the clear-cell variety⁶.

CT utilizing routine renal mass protocol is the primary imaging modality of choice for localization and staging of any renal tumour. However, in case of RCC and horseshoe kidney, CT angiography is highly recommended to check the renal vascularity, which generally varies and is essential for pre-operative planning. Because horseshoe kidney merges malformations and vascular changes, open surgery is the standard for treatment⁴. The surgical resection is considered the best therapeutic option in case of resectable disease.

References

1. Alamer A. Renal cell carcinoma in a horseshoe kidney: radiology and pathology correlation. *J Clin Imaging Sci.* 2013 Mar 29; 3: 12.
2. Tijani KH, Ojewola RW, Orakwe DE, Oliyide AE. Renal cell carcinoma in a horse shoe kidney: Report of a rare disease. *Niger postgrad Med J* 2016; 23:232-4
3. Tkocz M, Kupajski M. Tumour in horseshoe kidney - different surgical treatment shown in five example cases. *Contemp Oncol (Pozn).* 2012; 16(3):254-7.
4. Gaku Yamamichi, Wataru Nakata, Go Tsujimura, Yuichi Tsujimoto, Mikio Nin, Masao Tsujihata, Renal cell carcinoma in a horseshoe kidney treated with robot-assisted partial nephrectomy, *Urology Case Reports*, 2019; 25: 100902.
5. Rubio Briones, J., R. Regalado Pareja, et al. Incidence of tumoural pathology in horseshoe kidneys. *Eur Urol* 1998; 33(2): 175-9.
6. Navin Ram, Bharat Behera, Sudheer Rathi, Sameer Trivedi, Uday Shankar Dwivedi. *UroToday Int J.* 2012; 5(6):70.

Figures

Fig 1 CECT showing renal mass involving the right moiety of a horse shoe kidney

