A case of an adenocarcinoma within a horseshoe kidney (HK) is presented. Male patient presented with a history of a painless hematuria. A contrast enhanced magnetic resonance (MR) scan showed a horseshoe kidney. A large soft tissue mass was also noted on the right side. Kidney was receiving supply from two arteries on the left side and one at the right side. Angiography of the right renal artery demonstrated hypervascular tumor staining. The kidney was approached through midline abdominal incision, and a right heminephrectomy was performed. The histopathology examination showed pT2, grade 2 renal cell carcinoma. To conclude, angiography is indispensable for guiding surgical interventions.

Key words: renal cell, carcinoma, horseshoe kidney

INTRODUCTION

A horseshoe kidney (HK) is a rare, developmental anomaly that occurs in about 0.25% of the population. A HK predisposes to urinary stasis, infection and nephrolithiasis, but the development of cancer, although previously documented, is rare. Diagnosis of the horseshoe kidney may be difficult and enhanced magnetic resonance (MR) scan is essential in the diagnosis and management of these cases. Because vascularisation vary from case to case, several authors have recommended pre-operative arteriography in these situations, which helps to identify any vascular anomalies (seen in up to 70% of cases).

Heminephrectomy adapted to neoplastic localization remains the essential treatment. Such a case, of an adenocarcinoma arising within a HK, in which pre-operative arteriography and MR were performed is presented herein.

CASE REPORT

A sixty-two old male patient presented with a history of a painless hematuria of two months duration. The general physical examination was unremarkable, but examination of the abdomen revealed a hard, bimanually palpable, non-tender mass, about 12 by 10 cm in size, in the right lumber region.

Patient’s routine hematological and biochemical investigations were within normal limits, but examinations of the urine revealed a microscopic hematuria. An intravenous urogram (IVU) was suggestive of horseshoe kidney, with adequate function, although a persistent extrinsic impression was noted in the right pelvicalyceal system. A contrast enhanced magnetic resonance (MR) scan showed a horseshoe kidney. A large soft tissue mass was noted on the right side, which was supero medially displacing the pelvis. There was no evidence of extra-organ spread on the scan (Figure 1A). Angiography showed that kidney was receiving supply from two arteries on the left side and one at the right side. Cranial artery on the left side supplied two/thirds of the kidney. Caudal artery on the left side supplied the lower third of the kidney. Isthmus was also receiving supply that originated from the left caudal artery. Angiography of the right renal artery demonstrated hypervascular tumor staining (Figure 1B).

With preoperative diagnosis of a carcinoma in the horseshoe kidney, the patient was taken for surgery, following adequate preparation. The kidney was approached through midline abdominal incision, and the tumor localized to the right hemi-kidney, which was seen to extend into isthmus. The isthmus of the horseshoe kidney was cut 2 cm from tumor margin, and a right heminephrectomy was performed, taking care to ligate the supplying vessels. The para-caval lymph nodes were also removed. After ensuring there was no urine leak from the residual kidney, the procedure was completed.
The histopathology specimen showed a growth of 12x10 cm in dimension. On microscopic examination, the cellular pattern was pT2, grade 2 renal cell carcinoma. There was not metastasis in the removed para-caval nodes. The resection margin, renal vein and ureter were free of the tumor.

The patient had an uneventful post-operative course, and was discharged on the seventh postoperative day. The patient is presently well after a one year follow up, with a normal MR scan and renal function.

DISCUSSION

The blood supply to the horseshoe kidney can be quite variable. In 30% of the cases, it consists of one renal artery for each kidney, but the blood supply may be atypical, with duplicate or even triplicate renal arteries supplying one or both kidneys.

The isthmus and adjacent parenchymal masses may receive a branch from each main renal artery, or they may have their own arterial supply originating from the aorta either above or below the level of the isthmus. Not infrequently, this area is supplied by branches from the inferior mesenteric artery, the common or external iliac arteries, or the sacral arteries.

In this case of HK angiography showed triplicate renal arteries supplying different parts of the kidney with hypervascular tumor staining. Thus, careful angiographic examination together with MR findings enabled us to confirm renal anomaly, tumour situation and to plan surgical approach.

Although radical nephrectomy is the standard therapy for RCC in cases of neoplasm in a horseshoe kidney, there is a place for limited resection or heminephrectomy. In this case a right hemi-nephrectomy was performed, taking care to ligate the supplying vessels.

The isthmus, had to be divided during the removal of the cancer from the HK. Not only does division of the isthmus provide access to the draining lymph nodes, it also help us normalize the course of the remaining ureter, thereby minimizing the potential of further complications.

"Reperitonealization" helped us to reduce the problems of bleeding and urinary fistula from the sectioned parenchyma.

SUMMARY

ADENOKARCINOM POTKOVIČASTOG BUBREGA

Prikaz slučaja adenokarcinoma potkovičastog bubrega. Bolesnik muškog pola koji se javio zbog bezbolne hematurije. Snimak kontrastne magnetne rezonance je pokazao postojanje i karakteristike tumora.


FIGURE 1A
59 YEAR OLD MAN WITH RENAL CELL CARCINOMA IN A HOSESHOE KIDNEY. A. PREOPERATIVE MR SCAN REVEALS A HOSESHEOE KIDNEY WITH A WELL ENHANCED ISTHMUS AND A 3-cm ENHANCING MASS CLOSE TO THE COLLECTING SYSTEM IN THE RIGHT PART

FIGURE 1B
ANGIOGRAPHY SHOWED DUAL ARTERIES SUPPLIED BLOOD TO THE LEFT SIDE OF THE KIDNEY, AND ONE TO THE RIGHT SIDE OF THE KIDNEY. ANGIOGRAPHY OF THE RIGHT RENAL ARTERY DEMONSTRATED HYPERVASCULAR TUMOR STAINING. RIGHT KIDNEY IS COMPLETELY PATHOLOGICALLY CHANGED WITH THE TUMOUR FORMATION SPREADING INTO THE ISTHMUS

Hirurški pristup bubregu je bio kroz srednju medijalnu inciziju i učinjena je desna heminefktomija. Histopatološko ispitivanje je pokazalo adenokarcinom bubrega pT2, gradusa 2.

U zaključku angiografija ima značajno mesto u planiranju hirurške intervencije.

Ključne reči: bubreg, adenokarcinom, potkovičasti
REFERENCES


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