CASE REPORT

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Giant renal oncocytoma

Džinovski onkocitom bubrega

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Abstract

Background. Renal onkocytoma is a distinctive benign tumor derived from epithelial cells of the distal renal tubules. These tumors are often clinically asymptomatic, diagnosed accidentally and difficult to distinguish from renal cell carcinoma. **Case report.** We presented a giant renal onkocytoma in a man aged 64, without any signs or symptoms of the urogenital system disorder. The preoperative diagnosis described the tumor mass of the right kidney, size 16 × 14 cm, and indicated a malignant tumor of kidney. The patient underwent radical nephrectomy. The tumor was encapsulated at the intersection with the characteristic central hyaline scar. Microscopically, it was built of uniform polygonal cells with abundant eosinophilic cytoplasm. Immunohystochemiclly, tumor cells were immunoreactive to CK AE1/AE3 and CD 117, but showed negative immunoreactivity to CK 7, RCC marker and Vimentin. **Conclusion.** Giant renal oncocytomas are rare tumors with benign clinical course. As a rule, they are discovered by accident. Clinical differentiation from malignant tumors of the kidney is not possible. They are treated surgically, mainly by radical nephrectomy. A definitive diagnosis is made only by histopathological examination of tumors using immunohistochemical marker panels.

Key words:
kidney neoplasms; diagnosis, differential; adenoma, oxyphilic; diagnosis; histological tehniques; surgical procedures, operative.

Apstrakt

Uvod. Onkocitom bubrega je karakterističan benigni tumor, poreklom od epitelnih ćelija distalnih bubrežnih tubula. Klinički su često asimptomatski, dijagnostikuju se slučajno i teško ih je razlikovati od karcinoma bubrežnih ćelija. **Prikaz bolesnika.** Prikazali smo gigantski onkocitom bubrega kod muškarca, starog 64 godine, bez znakova i simptoma od strane urogenitalnog sistema. Preoperativnom dijagnostikom opisana je tumorska masa desnog bubrega veličine l6 × 14 cm, koja je ukazala na maligni tumor bubrega. Bolesnik je podvrgnut radikalnoj nefrektomiji. Tumor je na preseku bio inkapsuliran sa karakterističnim centralnim hijalinim ožiljkom. Mikroskopski, bio je građen je od uniformnih poligonalnih ćelija, sa obilnom eozinofilnom citoplazmom. Imunohistohemijski, tumorske ćelije su bile imunoreaktivne na CK AE1/AE3 i CD 117, a negativnu imunoreaktivnost pokazivale su na CK 7, RCC marker i Vimentin. **Zaključak.** Gigantski onkocitomi bubrega su retki tumori sa benignim kliničkim tokom. Po pravilu se otkrivaju slučajno. Klinička diferencijacija od malignih tumora bubrega nije moguća. Lečenje je operativno, uglavnom radikalnom nefrektomijom. Definitivna dijagnoza se postavlja isključivo histopatološkim pregledom tumora, primenom panela imunohistohemijskih markera.

Ključne reči:
bubreg, neoplazme; dijagnoza, diferencijalna; adenom, oksifilni; dijagnoza; histološke tehnike; hirurgija, operativne procedure.

Introduction

Oncocytoma is a benign epithelial tumor that consists of oncocytes, large cells characterized by the profusion of mitochondria with eosinophilic granular cytoplasm. Renal oncocytoma suggests the origin of distal renal tubule cells and accounts for about 3%–7% of primary renal tumors [1]. The majority of them are asymptomatic and are accidentally discovered [2]. Renal oncocytoma was first described in 1942 by Zippel [3] as a unique pathological entity. We presented a giant renal onkocytoma as a very rare entity.

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Case report

A 64-year-old male patient after being examined for hypertension, was referred to the urologist due to the initial stage of renal failure. He was without any symptoms regarding the urogenital tract. On physical examination, by bimanual palpation of the flank area a painless mass the size of an adult male fist was palpated in the right loin. Ultrasonography followed by multislice computed tomography (MSCT) with intravenous urography (IVU) described a totally anatomical alteration of the right kidney with an expansive encapsulated nodule 16 × 14 × 13 cm with central zones of necrosis (Figure 1) with a

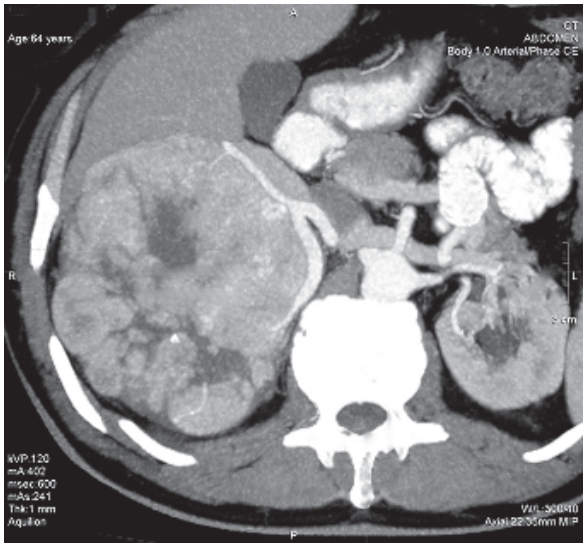

Fig. 1 – Multislice computed tomography of the abdomen – an expansive tumor of the kidney

partially preserved parenchyma in the upper pole of the kidney. The renal pelvis and ureter of the right kidney were not shown on IVU. Angiography described a hypervascular tumor mass in the arterial phase with pathological accumulation of contrast in the parenchyma phase (Figure 2). The complete ra-

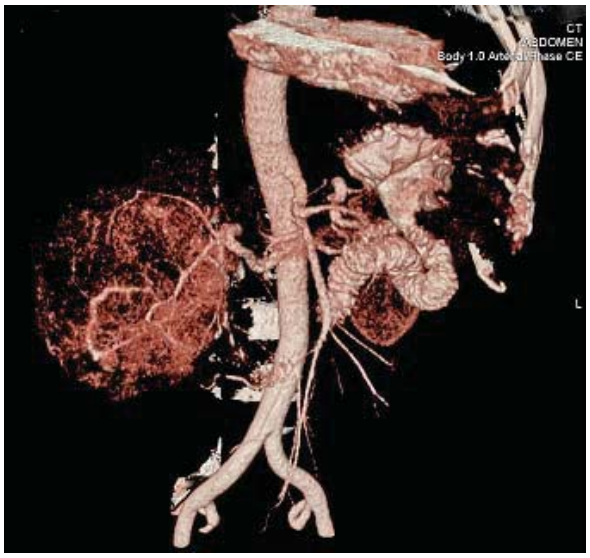

Fig. 2 – Multislice computed tomography angiography – pronounced pathological vascularization

diologic imaging suggested renal cell carcinoma (RCC). The patient underwent radical nephrectomy employing transabdominal subcostal approach. During the course of an almost three hour surgery, there was no significant intraoperative hemmorhage as renal hilus blood vessels were timely tied off. The postoperative course was regular. The patient was discharged on the 9th postoperative day fully recovered.

Macroscopically, the kidney was deformed by the tumor and weighed around 900 g. On its section, there was a solid oval encapsulated tumor of 16 cm in diameter, lobular structure, tan brown in color with a central dense fibrous band with fibrous trabeculae extending out in a stellate pattern to the margins of the tumor and infrequent dark brown areas (Figure 3).

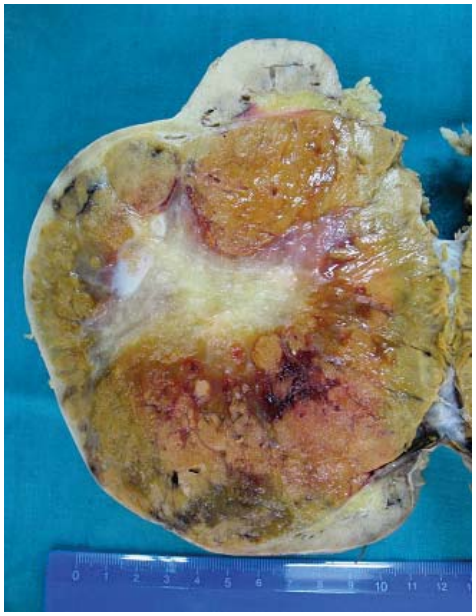

Fig. 3 – Macroscopic appearance of renal oncocytoma

For the purpose of routine histopathological examination, the material was fixated in 10% buffered, neutral formalin, embedded in paraffin, cut with a microtome 5 microns in depth and treated by the standard hematoxillin-eosin (HE) method. For the purpose of immunohistochemical analysis, streptavidin-biotin peroxidase technique was used in the standard procedure (DAKO, LSAB Kit), using monoclinic antibodies for cytokeratin AE1/AE3 (CK AE1/AE3), cytokeratin 7 (CK 7), RCC and Vimentin and polyclinic antibodies for CD117 (c-kit), (DAKO, Denmark). 3,3' – diaminobenzedin (DAB) was used as a chromogenic substrate and the slides were contrasted with Mayer hematoxillin.

Microscopically, the tumor was formed of uniformed polygonal cells with distinct cellular margins with rich eosinophilic granular cytoplasm, without nuclear atypia, with noticeable nucleoli arranged in an alveolar, solid or in a rare tubular manner (Figure 4). Mitoses were not seen. Immunohistochemically, the tumor cells showed weak cytoplasmatic immunoreactivity to CD 117 (Figure 5) and distinct diffuse cytoplasmatic immunoreactivity to CK AE1/AE3 (Figure 6) and the absence of immunoreactivity to CK 7, RCC marker and Vimentin.

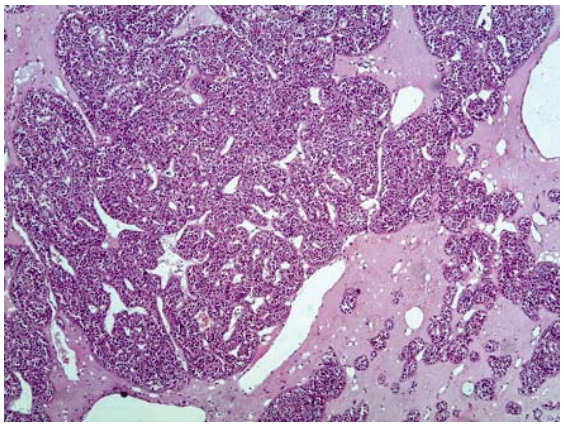

Fig. 4 – Aggregates of small eosinophilic cells – oncocytes (hematoxillin-eosin, × 50)

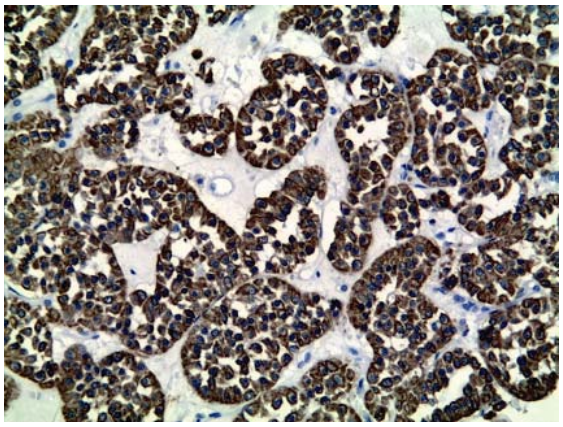

Fig. 5 – Weak focal cytoplasmic immunoreactivity of tumor cells to CD 117 (L SAB$^+$, × 200).

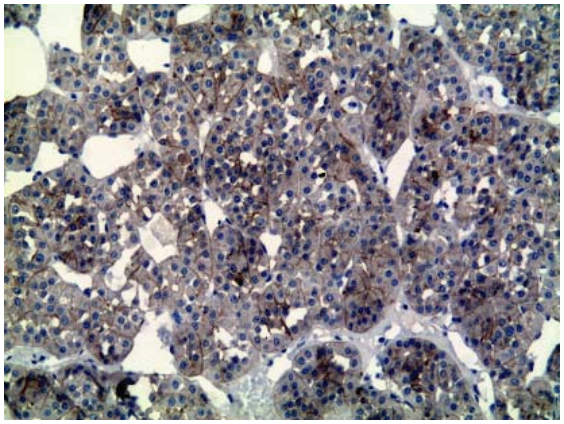

Fig. 6 – Diffuse cytoplasmic immunoreactivity expressed by tumor cells to CK AE1/AE3 (L SAB$^+$, × 200).

Discussion

Renal oncocytomas are grossly round, tan or light brown in color, encapsulated, well circumscribed and have the average size of 4–6 cm. Oncocytes are large epithelial cells with minimal nuclear atypia, with a developed eosinophilic cytoplasm and uniform nuclei. Oncocytomas built of well differentiated cells are benign nonaggressive tumors, which do not give metastasis and have a favorable clinical course [4].

Oncocytomas do not have a characteristic clinical presentation and are frequently diagnosed accidentally by using radiological imaging techniques such as ultrasound computed tomography (CT) or magnetic resonance imaging (MRI), because of other problems. Preoperative diagnostic methods are unable to differentiate oncocytomas from RCC. Oncocytomas are presented as solid, homogenous well circumscribed tumor formations with different attenuations similar to RCC. The central stellate pattern scar that is often imaged on the CT scan and a typical spoke-wheel pattern on the angiogram may suggest the diagnosis of oncocytoma but previous experiences have proved them unreliable and of insufficient predictive valuae [5]. Aspiration biopsy may give a preoperative diagnosis but is unreliable. A sufficient tumor specimen is not always obtained and there is a risk of hemorrhage from a hypervascular tumor. The limited value of biopsy is a confirmed presence of RCC and oncocytoma in the same lesion or in the different area of the same kidney. Due to the preoperative suspicion of RCC and the unreliable diagnosis by frozen section, radical nephrectomy is the safest method of therapy unless contraindicated by other factors (solitary kidney, bilateral tumors or poor renal function).

In a case report on renal oncocytoma in November 2010, being the fourth in weight (1973 g, dimensions 27 × 16 × 13 cm), Anastasiadis et al. [6] reviewed the largest and heaviest cases published in literature: Demos et al. [7] (4652 g, 27 × 20 × 15cm), Banks et al. [8] (3090 g , 21 × 18 × 15 cm), and Kiliç et al. [9] (2680 g, 20 × 15 × 10 cm). In no single case renal oncocytoma could be differentiated from RCC preoperatively [10] neither clinically nor by using radiological imaging.

It is very important to carefully examine both kidneys because 13% of patients have multiple oncocytomas and up to 32 % have synchronous RCC [11]. The definitive diagnosis is made by histopathological examination of the tumor, applying histochemical and immunohistochemical methods and ultrastructural analysis in some cases [12]. Renal oncocytomas show similar immunoprofile as RCC, especially with eosinophilic variations. Some studies suggest the use of different markers such as Vimentin, S-100 protein and CD82, but the interpretation of these markers must be done with caution [13].

Conclusion

Renal oncocytomas may be asymptomatic for prolonged periods of time and can became very large in size. Inadequacy of specific diagnostic methods and the overlapping of radiological characteristics with RCC make their clinical differentiation hard. Definitive diagnosis is usually made after removing the tumor surgically, through histopathological examination using adequate (immuno) histochemical analysis.

This case confirms the difficulties in making a preoperative diagnosis even by the use of contrasting the enhanced graphic representation of such a large tumor lesion. This emphasizes the necessity to include renal oncocytomas in the differential diagnosis of such lesions, as a reliable preoperative diagnosis of oncocytomas provides for nephron sparing surgery.

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