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Case report

Renal cell carcinoma with alpha-fetoprotein secretion and tissue expression – A case report

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ABSTRACT

Introduction: Alpha-fetoprotein (AFP) is a glycoprotein which can be elevated in some non-oncological conditions, and in few types of cancers being a diagnostic and monitoring biomarker. Kidney cancer can produce several substances, which have biological activity and even cause paraneoplastic syndromes. AFP elevation in course of renal cancer is extremely rarely encountered.
Aim: To present diagnostic difficulties in a case of a 43-year-old man with a kidney tumor.
Case study: Clinical and pathological case description.
Results and discussion: The patient initially presented with features of urogenital infection and lumbar pain. Performed diagnostics revealed at first epididymitis, then serum elevation of AFP, and finally renal tumor. Based on wide immunophenotyping, the tumor was histopathologically recognized as high grade clear cell renal cell carcinoma with AFP expression. Clinically the patient presented unexpected rapid cancer progression with parallel increase of above biomarker level, causing repeated exclusion assessment of germ cell tumor.
Conclusions: The diagnostics of kidney mass in our patient was interfered and complicated by concomitant genital infection and AFP serum elevation. Clinically found increased level of AFP requires extensive evaluation, including diagnostics of different tumors.

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1. Introduction

1.1. Symptoms of kidney cancer

Kidney cancer accounts about 3% of all adult type cancers in Europe. Typical symptoms of advanced renal cell carcinoma are: flank mass, pain and hematuria. However, nowadays renal tumors are often diagnosed incidentally at the ultrasonographic screening. Kidney cancer may produce several factors that may have systemic effects.[1] It is the most frequent genitourinary neoplasm that causes paraneoplastic syndromes (PNS), although PNS in course of genitourinary neoplasia occur rarely. Kidney cancer may produce substances with a potential of biological activity such as adrenocorticotropic hormone (ACTH), corticotropin-releasing hormone (CRH; Cushing syndrome), parathyroid hormone-related protein (PTHrP; hyperkalcemia), renin and erythropoietin (hypertension), insulin, glucagon (hypoglycemia, hyperglycemia), human chorionic gonadotropin (HCG), prolactin, and antidiuretic hormone (ADH).[2] It may also secrete factors that cause pyrexia, cachexia, neuromyopathy, amyloidosis and abnormal liver dysfunction.[1,3] Moreover, very rarely kidney cancer can produce alpha-fetoprotein (AFP).

1.2. Characteristics of AFP

AFP is a glycoprotein of 70 kD consisting of 591 amino acids with sequence similar to albumin, vitamin D and alpha albumin.[4] The exact physiological role of AFP has not been determined, but probably it is involved in the transport of hormones, bilirubin, fatty acids, retinoids, and heavy metals.[4] AFP is the main protein in fetal plasma being produced by cells of yolk sac, and later by the cells of liver, kidneys and the gastrointestinal tract, reaching up to 500 μm/L in the third trimester.[5,6] Its level is used as a 'triple test' in the prenatal diagnostics of some genetic disorders and neural tube defects.[7] After birth, AFP plasma level decreases rapidly to the end of the first year of life and it achieves a normal low level up to 15 μm/L.[8] AFP is one of the established tumor markers which is used to diagnose and monitor treatment of malignant germ cell tumors, as well as hepatic malignancy.[9]

2. Aim

The aim of this paper was to report a rare case of AFP producing renal cell carcinoma.

3. Case study

A 43-year-old man visited his general practitioner in December 2012 because of a left-sided lumbar colic pain. In January 2013 he reported pain in the region of his left testis, accompanied by fever and dysuria. Diagnostic imaging and laboratory tests were performed. Abdominal ultrasonography revealed slight enlargement in the lower pole of the left kidney and significant thickening of the left epididymis. Both testicles were without abnormalities. Laboratory tests showed leukocyturia and elevated CRP level. Due to genitourinary tract infection with high fever, antibiotic treatment with ciprofloxacin was prescribed, with a good therapeutic effect in 2 weeks. In the end of February 2013 the patient was hospitalized due to hematuria with blood clots and urinary retention. At that time laboratory tests revealed slight anemia and elevated levels of AFP (more than 1 318 IU/mL), with normal B-HCG level. Suggestion of germ cell tumor was considered.

Extended diagnostic imaging with CT and MRI showed tumor of the left kidney especially in the inferior pole with thrombus filling left renal vein. Liver was without abnormalities, and chest X-ray was normal. In March 2013 patient underwent uncomplicated left-side nephrectomy with adrenalectomy. Pathological gross examination disclosed a tumor of kidney measuring 10.0 × 7.5 cm with fibrous capsule, perineural, fat and renal vein invasion. Microscopic examination showed malignant epithelioid predominantly clear cell tumor with focal papillary pattern, dense vasculature and focal perivascular arrangements. Differential diagnosis included various types of neoplasm, but mainly renal cell carcinoma and germ cell tumors (yolk sac tumor). On immunohistochemical staining tumor cells were CD10 (+), Vimentin (+), Cytokeratin CAM5.2 (+), racemase (AMACR) (+), placental alkaline phosphatase (PLAP) (−), EMA focally present, PAX_8 (+) and negative for cytokeratin 7, cytokeratin 19, Glypican 3, HMB45.[10] Moreover, AFP expression was found in neoplastic cells (Figs. 1–4). High grade renal clear cell carcinoma, G3 according to Fuhrman, in stage pT2b was recognized. All resection margins were free from the cancer. In the end of April 2013 a control thoracic CT scan detected a conglomerate of metastatic lesion measuring 20 × 17 mm in the right lung and right pulmonary hilar lymph nodes enlargement. Moreover, it showed numerous hypodense metastatic foci in liver and a mass 50 × 38 mm within the space of removed kidney (Fig. 5). Blood tests showed slight anemia and significantly increased level of AFP (more than 10 000 IU). The patient was admitted to chemotherapy department with treatment intention. Due to an unusual dynamic clinical course and increasing AFP level, ultrasound and MRI of testes and core

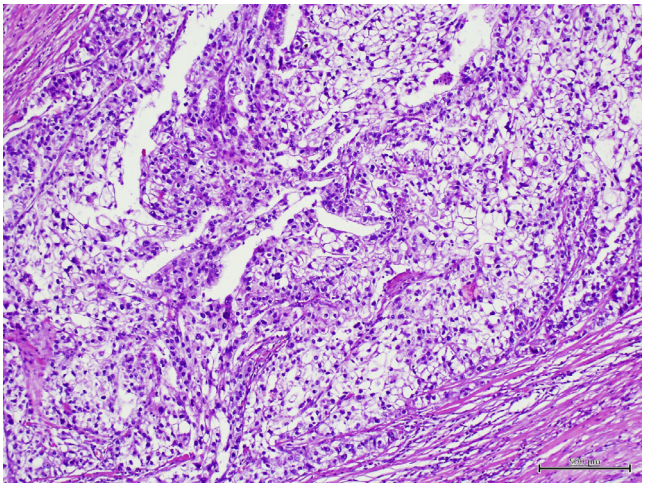

Fig. 1 – Renal cell carcinoma with papillary features (HE, magnification 100×).

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