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Teaching cases

Mucin-producing renal oncocytoma. An undescribed variant of oncocytoma

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ABSTRACT

We report here one case of renal oncocytoma producing focal extracellular mucinous secretion in a 47-year-old woman. To the best of our knowledge, the presence of mucinous secretion in this tumor has not yet been reported. Mucin production, despite its low frequency, can be considered an additional feature of renal oncocytoma. Therefore, oncocytoma should be added to the list of parenchymal renal tumors that can show significant mucin secretion, and it should be included in the inventory of morphologic variations of oncocytoma which may cause diagnostic difficulties.

Introduction

Renal oncocytoma may present unusual morphologic features, including hemorrhage, central or multiple cysts, focal nuclear pleomorphism, groups of small cells (vimentin positive), intratumoral vascular invasion, intratumoral adipocytes, calcification, intranuclear inclusions, vacuolated cells [19], osseous and myeloid metaplasia within the stroma [15], occasional papilla formation [2], small foci of necrosis [3], extension of tumor into perinephric fat [3], extra-neoplastic venous invasion [8], dominant small cells [7], cylindromatous changes [9], obliterative renal fibrosis [5], involvement by metastatic tumor [1], multicentricity with growth in multiple oncocytic nodules (oncocytosis or oncocytomatosis)[20], hybrid morphology with chromophobe renal cell carcinoma [16], presence of Gamna-Gandy bodies [23], and intraneoplastic diffuse and prominent xanthomatous reaction [23].

We report herein one case of renal oncocytoma producing focal extracellular mucinous secretion. To the best of our knowledge, the presence of mucinous secretion in this tumor has not yet been reported.

Case report

A 47-year-old woman was referred to the Urology Service for a large right renal neoplasm diagnosed by ultrasound examination. Her past medical history was remarkable for type II diabetes mellitus and essential arterial hypertension. Computed tomography scan of the abdomen showed a solitary, circumscribed, homogeneous, 6-cm mass located in the upper posterior segment of the right kidney. A right partial nephrectomy was performed.

Materials and methods

The renal specimen was fixed in 10% buffered neutral formalin and embedded in paraffin following standard procedures. Deparaffinized sections were stained with hematoxylin and eosin, Mayer's mucicarmin, Alcian blue, pH 2.5, Alcian blue, pH 0.4, and periodic acid Schiff procedure.

Selected sections were immunostained using the Dako FLEX Ready-to-Use System (Dako, Glostrup, Demmark) and an automated immunostainer (AutostainerLink 48, Dako). The primary antibodies used are listed in Table 1. For pre-treatment, a retrieval solution (Dako) was used. Appropriate controls were included.

For the fluorescence *in situ* hybridization (FISH) analysis, 5 μm-thick sections were cut from a paraffin-embedded block. Alpha-satellite centromeric DNA probes (CEP) for chromosomes 7 and 17 were obtained from Vysis (Downers Grove, Il, USA). The CEP 7 and CEP 17 were diluted with tDenHyb1 (Insitus, Albuquerque, NM, USA) in a ratio of 1/100. Five microliters of diluted probes was added to the slide in reduced light condition. The slides were counterstained with 10 μL of DAPI/Antifade (DAPI in Fluorguard, 0.5 μg/mL, Insitus). These slides were examined using a MetaSystem Axioplan 2 System with appropriate DAPI and Spectrum Green filters.

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Table 1
List of all antibodies used.

Antibody for	Clone	Source	Dilution	**Pretreatment**
Vimentin	V9	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 9
Estrogen receptor alpha	SP1	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 9
Progesterone receptor	PgR636	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 9
CD10	56C6	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 9
Renal cell carcinoma marker	SPM314	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 9
Ki67	MIB1	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 6
c-kit (CD117)	Polyclonal	Dako, Glostrup, Denmark	1/200	Retrieval solution* pH 9
Cytokeratin	AE1/AE3	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 9
Cytokeratin 7	OV-TL12/30	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 9
E-Cadherin	NCH-38	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 9
Mitochondrial antigen	113-1	BioGenex, San Ramon, CA, USA	1/400	Retrieval solution* pH 9
AMCR (racemase, P504S)	13H4	Dako, Glostrup, Denmark	FLEX prediluted	Retrieval solution* pH 9

* Dako, Glostrup, Denmark.

Pathologic findings

The surgical specimen weighed 182 g with attached perinephric adipose tissue. The upper pole was distorted by a 6 × 5.5 × 5.5 cm, well-circumscribed, uniform, non-encapsulated, tan to pale yellow tumor (Fig. 1). Central scarring was not present.

Conventional histopathologic preparations showed a neoplasm with cells arranged in a predominantly tubular pattern embedded in scant hypocellular myxoid stroma. The cells were uniform, medium in size, and cuboidal to polygonal. Their cytoplasm was homogeneous, acidophilic, and granular. The nuclei of cells were regular, round to oval with evenly dispersed, finely granular chromatin. Nucleoli were often present but small. No mitoses were found.

Scattered tubules containing basophilic mucin in their lumens were observed (Fig. 2A). Mucin-producing cells showed features of oncocytic cells (Fig. 2B). Intracytoplasmic mucin was not observed (Fig. 2C). Presence of secretion was observed in 5 of the 6 tumor-containing slides (83%). The mucin stained strongly with Alcian blue at pH 2.5 and Mayer's mucicarmin. The presence of strongly acidic sulphated mucosubstances was demonstrated with Alcian blue at pH 0.4 (Fig. 2D).

Tumor cells showed an intense, diffuse immunoreaction for antimitochondrial antibody (Fig. 3A), cytokeratin AE1/AE3, E-cadherin (Fig. 3B), and c-kit (CD117) (Fig. 3C), as well as scattered reactivity in single cells for cytokeratin 7, alpha-methylacyl-coenzime A racemase (AMACR, P504S), and progesterone receptor. Proliferative activity, as revealed using Ki67 (MIB1), was 2.05%. Tumor cells were negative for vimentin (Fig. 3D), estrogen receptor alpha, CD10, and renal cell carcinoma (RCC) marker.

The fluorescent signals were scored in normal and neoplastic nuclei with a total of 200 nuclei. No gains of chromosomes 7 and 17 were observed in tumor cells.

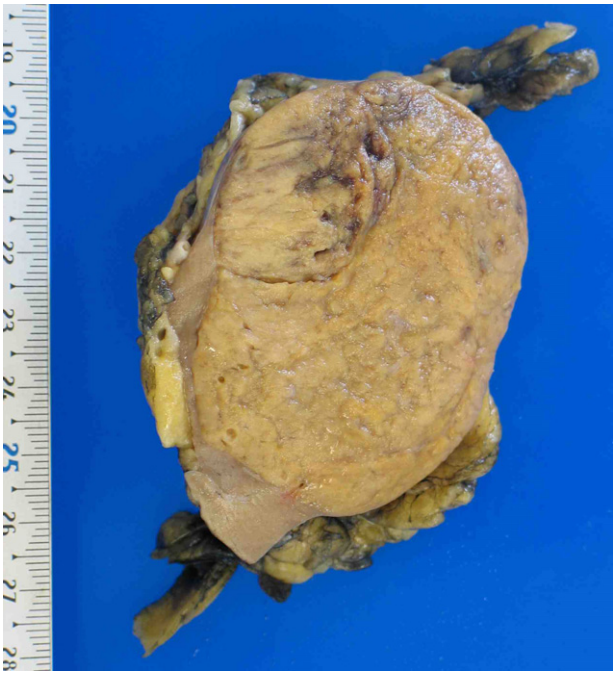

Fig. 1. Renal oncocytoma. The tumor is circumscribed and tan to pale yellow.

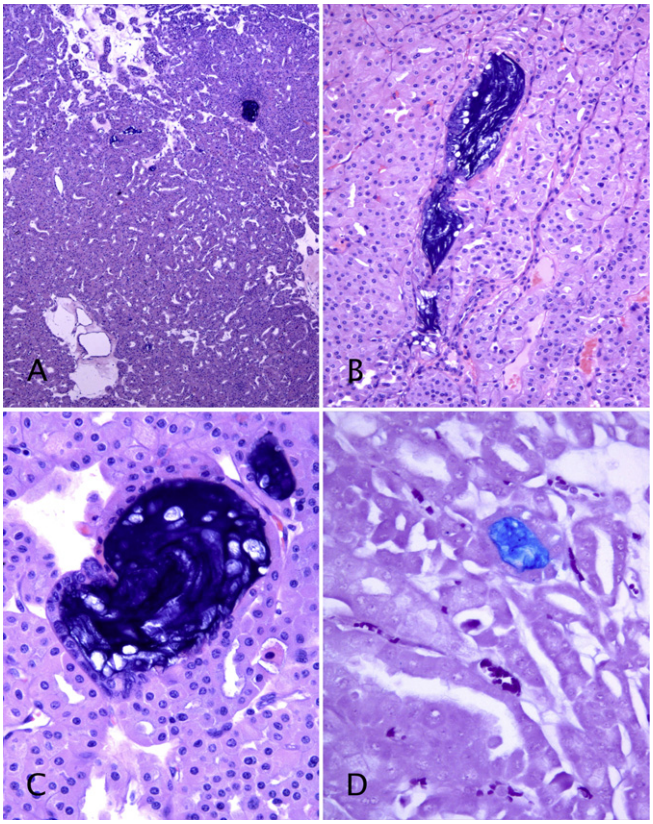

Fig. 2. Mucin-producing renal oncocytoma. (A) Panoramic view of scattered foci of extracellular mucin secretion (HE). (B) Medium power view of foci of intratubular (luminal) acid mucin (HE). (C) High power view of extracellular mucin. Oncocytoma cells showed absence of intracellular mucin (HE). (D) Sulphated mucin stained with Alcian blue, pH 0.4.