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Metanephreic Adenoma of the Kidney

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ABSTRACT

Metanephric adenoma is a rare benign tumor of the kidney. Macroscopically, the cut surface of the tumor shows a well-circumscribed mass of grey to yellow color. Here we have presented our experience with 2 cases of metanephric adenoma. Although it is very difficult to differentiate it from malignancy by clinical or radiological findings, the differentiation is mainly done by histopathology and immunohistochemistry. Complete surgical removal or polar nephrectomy is the proper treatment in almost all cases.

INTRODUCTION

Metanephric adenoma is a rare benign renal tumor [1-4] and only 80 cases have been documented till now [1]. The concept of metanephric adenoma was recognized as a different entity of adult-onset Wilms tumor [5]. If the tumor is characterized by proliferation of spindle cells surrounding multifocal nodules of epithelial cells, it should be designated as a nephrogenic adenofibroma or metanephric adenofibroma [6]. Argani and Beckwith have recently described another renal tumor designated as metanephric stromal tumor that consists purely of a mesenchymal component without an epithelial component [2]. Pathologists should consider that the spectrum of these 3 metanephric tumors is morphologically continuous [6]. Metanephric adenomas are usually encapsulated and are not associated with metastasis or recurrence [3]. Therefore, further studies on various aspects are needed to identify the gene responsible for the occurrence of metanephric tumors and, also, to clarify the association among the 3 types of metanephric tumors [6].

CASE REPORTS

Case Number 1

A 29-year-old female patient presented with a 6-month history of right-sided, localized, dull aching flank pain with no history of burning micturation or hematuria. On examination no mass was palpable in the right renal area. Ultrasonography revealed a 3.2 cm by 3 cm heterogeneous space occupying lesion (SOL) in the upper pole of the right kidney. The computed tomography (CT) scan showed a 4.2 cm by 4.2 cm mixed density heterogeneously enhancing mass in the upper pole of the right kidney (Figure 1) and the left kidney was normal. On metastatic workup, no metastasis was detected. Laparoscopic radical nephrectomy was done. During operation, no features of local metastasis were found. The cut surface showed a big tumor involving the upper pole up to the hilum, which was yellowish in color with hemorrhagic areas (Figure 2). Histopathological examination showed tiny tubules and papilla accompanied by very scanty stroma. The nuclear features were bland, and the overall features were similar to developing metanephric tubular epithelium. On immunohistochemistry, lectin, keratin, and epithelial membrane antigen (EMA) were positive.

Case Number 2

A 37-year-old female presented with complaints of left flank pain off and on, and had no history of dysuria or hematuria. On Ultrasonography, a heterogeneous solid renal SOL 3.2 cm by 2 cm in the upper pole of the left kidney was seen, and the other kidney was normal. Contrast-enhanced computed tomography (CECT) of the abdomen showed an enhancing

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Figure 1. CECT showing a heterogenous tumor in the upper pole of the right kidney.

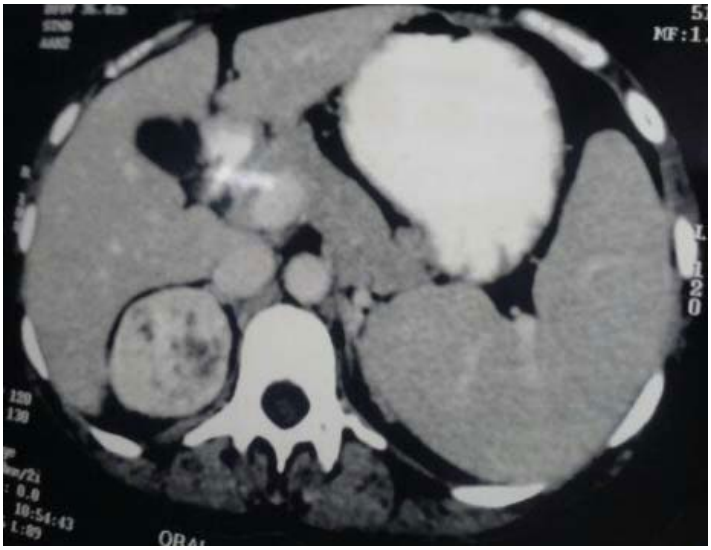
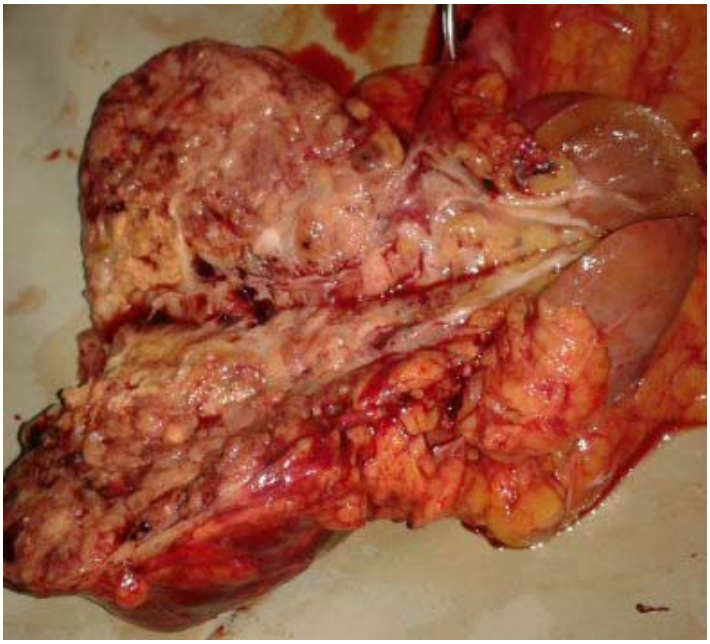
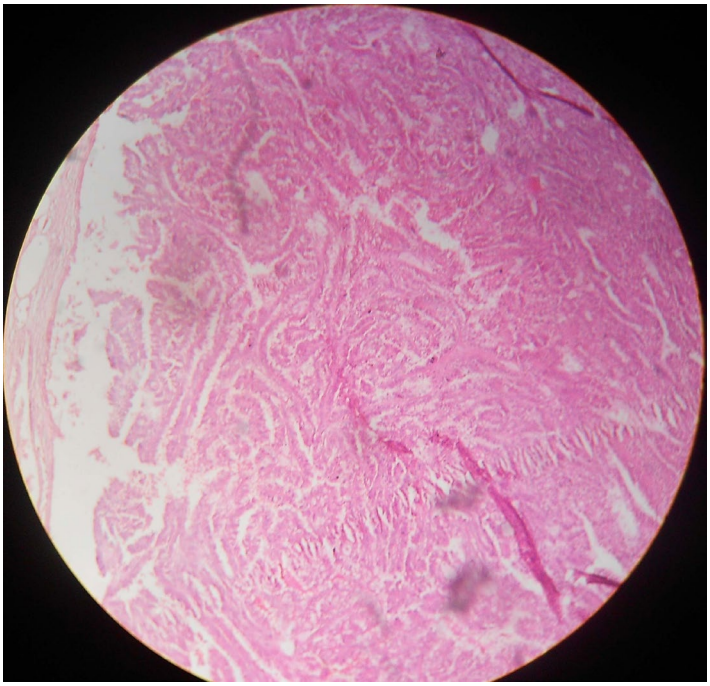


Figure 2. Cut surface of the tumor showing yellowish color in hemorrhagic background.



lesion of the same size with no evidence of metastasis or retroperitoneal lymphadenopathy. Metastatic workup was negative. She underwent left radical nephrectomy. On gross examination, the specimen was solid and white in color with no areas of necrosis. Histopathalogical examination showed a highly cellular, tightly packed small tubules and acini lined by monomorphic cells lying in a loose oedematous stroma. The tumor cells were bland in appearance and did not show significant mitotic activity. No lymphovascular invasion was found (Figure 3). On immunohistochemistry it showed lectin and EMA positivity.

Figure 3. Microphotograph showing tiny tubules and papilla with very scanty stroma (H&E X 400).



DISCUSSION

Metanephric adenoma is a very rare tumor and till now only few cases are reported [1-5]. As the kidney develops from metanephros, the remnants of this tissue remain within the renal parenchyma in post-natal life and often develop into Wilms tumor whether blastemal component remains and predominates. Metanephric adenoma develops when a blastemal component is absent or not predominant. So, metanephric adenoma and Wilms tumor are histologically related [7] though Wilms tumor is more common than metanephric adenoma.

It generally occurs in adult females but also occurs in children. Most of the patients suffer from dull aching flank pain, hematuria, or something asymptomatic. In some patients paraneoplastic syndrome like polycythemia and hypercalcemia is found. It is a benign and slow-growing tumor. They are usually

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encapsulated and not associated with metastasis or recurrence. Tumor size is considered as the criteria to differentiate between malignant and non-malignant tumors, with 3 cm being the cut-off [4]. Treatment is usually radical nephrectomy as it is diagnosed only by histopathological examination. Partial nephrectomy is considered adequate for polar lesions.

Both metanephric adenoma and Wilms tumor have tubular, tubulo papillary structures, and glomeruloid bodies [7,8]. Metanephric adenoma lacks the large nuclei and other primitive components that are characteristics of Wilms tumor. The lining cells in metanephric adenoma are bland. Sometimes these two may coexist; so proper histological examination and immunohistochemistry are essential for the diagnosis [9]. Morphologically metanephric adenoma is often compact, showing compact tubules within much stroma, lined by bland cells. Immunohistochemistry positivity for metanephric adenoma are lactin, keratin, and EMA. S-100 protein expression is very high in metanephric adenoma, and they are also positive for vimentin and Leu7 [6], but negative for WT1, which is positive in Wilms tumor. So further studies on various aspects are needed to identify the gene responsible for the occurrence of metanephric adenoma and also to differentiate it from oncogenes for Wilms tumor.

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