e - ISSN - 2349 - 8005

INTERNATIONAL JOURNAL OF ADVANCES IN CASE REPORTS

Journal homepage: www.mcmed.us/journal/ijacr

METANEPHRIC ADENOMA OF KIDNEY: A CLINICOPATHOLOGIC STUDY OF 2 CASES

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Article Info
Received 15/03/2015
Revised 27/03/2015
Accepted 25/04/2015

Key words:
Metanephric adenoma, Pathological diagnosis, Prognosis.

ABSTRACT
Metanephric adenoma is a rare, benign neoplasm of renal epithelial cells. It is difficult to be identified from other neoplasms. Here we describe 2 MA cases to present the clinical manifestations, imageology, pathology, diagnosis and treatment of MA. In this article we also reviewed the previously published MA cases and recent literature.

INTRODUCTION

Metanephric adenoma (MA) is a rare neoplasm, it is benign and accounting for about 0.2% of renal epithelial neoplasms [01]. It was firstly described by Brisigotti in 1992[02]. Most of MA cases occurs in patients aged from 50-60 years and is rare in children. The male and female ratio is 1:2 [03]. But a 7-year-old girl had been reported diagnosed with MA recently [04]. MA was usually believed to be a unilateral lesion, but recently a multilateral case had been reported in child aged 6 [05]. Clinical manifestations and radiological features of this neoplasm are non-specfical. The final diagnosis of MA depends on histopathological and immunohistochemical analysis. Early diagnosis and effective treatment are critical. Partial nephrectomy is effective treatment at this stage. Here we describe 2 MA cases and reviewed the previously published MA cases and recent literature.

Case Report-1

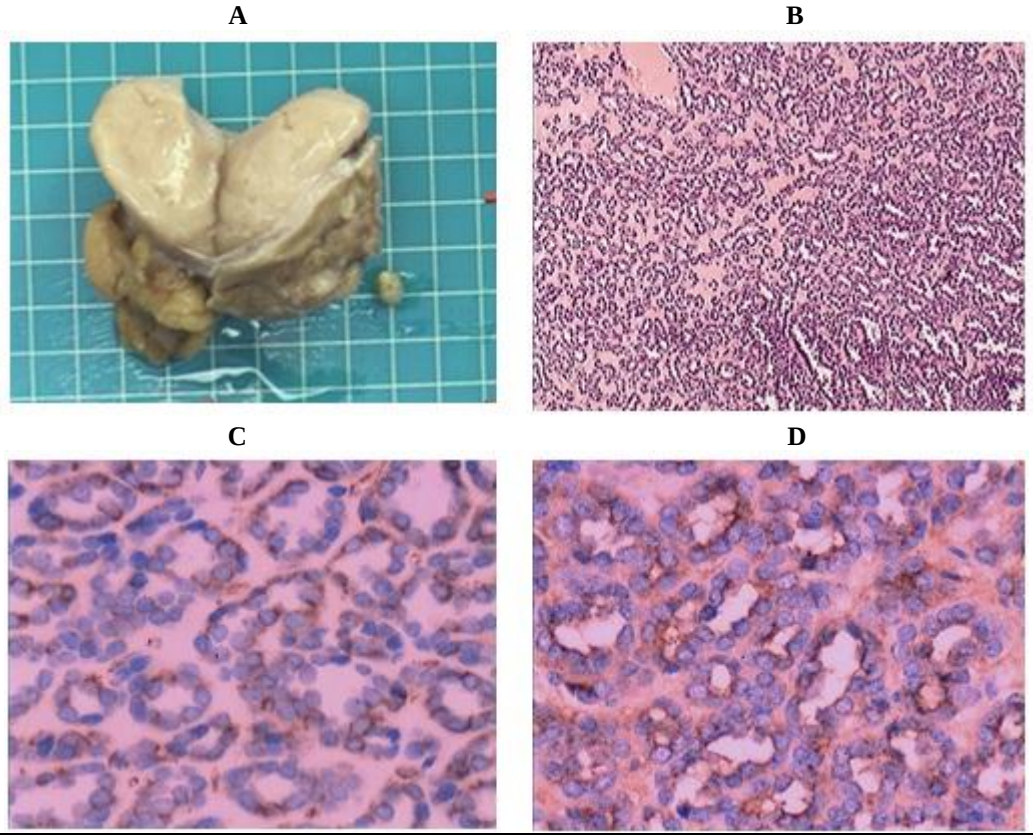
A female aged 40 complaining of a right lumbar mass for was admitted to our hospital. Blood RT and other routine hematological and biochemical examination were normal. CT tests found a solid mass measuring 6.0 x 4.8cm in the lower pole of the right kidney. It was well-demarcated, 42HU, and was slightly enhanced after enhancement, with septation and cystic areas in the interior. Given the size of the tumor and the possibility of malignancy, a radical nephrectomy was finally performed. The specimen showed monotonous, acinar and tubular structures lined by small, uniform, epithelial cells with scanty cytoplasm and hyperchromatic round nuclei. A diagnosis of MA was suggested after pathological diagnosis. There is no recurrence after a 3-year follow up.

Case Report-2

A 51-year-old female with no previous heath problem complained of flank pain for 1 months. US showed a hypoechoic mass with solid aspect and regular limits in the lower pole of the left kidney. CT found a 4.5 x 4.0cm solid tumor with intermediate attenuation and minimum venous contrast enhancing at that anatomic site. The patient went under a successful partial nephrectomy by laparoscope. Pathologically, the tumor is composed of closely packed small epithelial cells with tiny regular nuclei, a high nuclear-cytoplasmic ratio, and no mitotic

figures. Immunohistochemically, the tumor tissue showed diffuse positive staining for CD57 and Vimentin, and weakly positive for WT1. Immunostain for EMA, CD10, CD34 were negative (FiguresA/B/C/D). A diagnosis of MA was suggested based the pathological diagnosis. The patient remains no recurrence after a 2-year follow up.

Figure 1. Metanephric adenoma of case report-2. (A) Macroscopic appearance of the tumour. (B) Retiform and micropapillary architecture of the tumor [hematoxylin-and-eosin stain; 200X]. (C) Diffuse, strong positive cytoplasmic immunostaining of the tumor for CD57 (400X). (D) Diffuse, strong positive cytoplasmic immunostaining of the tumor for vimentin (400X).



DISCUSSION AND CONCLUSION

About a half of MA patients do not appear clinically symptoms, such as flank pain, haematuria, fever, hypertension polycythaemia et al. Interestingly, nearly 10% MA patients was combined with polycythemia [06], this was probably caused by paraneoplastic syndrome. Scientists detected EPO, GM-CSF,G-CSF in the culture medium of MA cells[07],but the relevance between polycythemia and these biomolecules is still unclear. Other complications such as hypercalcemia and chyluria are also reported in some MA cases.

The imaging characteristics of MA lack specificity and have not been described clearly until now. Generally, MA more common presented as a well-circumscribed, round or oval, solid mass on ultrasonography and sometimes with hypoechoic rim, which occasionally could show a cystic mass. The power Doppler evaluation demonstrated that the lesion was hypovascular. MA appears as hyperdense mass on pre-contrast CT and slight enhancement after contrasted. Peak enhancement of the neoplasm in the late nephrographic phase was also reported [8]. In magnetic resonance imaging, MA presented as isointense on T1 WI and heterogeneous hyperintense on T2 WI.

The gross specimen of MA is a firm lesion of light brown tissue with reticulated central area and clear boundary from the adjacent renal tissue. Unlike renal adenoma, which is defined by 5 mm in diameter, MA can be very large (6 to 200 mm in diameter). Our findings were renal tumors of 45 and 60 mm. Microscopially, the tumor is composed by small, uniform, epithelial cells, the cytoplasm is scant with a high nuclear-cytoplasmic ratio. Abundant psammoma bodies were common but mitoses were rare. Large tumor tissue can be heterogeneous, hypovascular, and frequent foci of hemorrhage, necrosis and calcifications.

The immunohistochemistry staining patterns of MA is controversial. MA is frequent focal positivity for CD7 and CD57, and diffuse positivity for vimentin, WT1, AE1/AE3, but negativity for EMA, CEA, CgA, S-100, Syn, Actin [11]. This can be used in differential diagnosis

of papillary renal cell carcinoma (RCC), as papillary RCC is positive for CK7 and EMA [09]. A recent study found cadherin 17(CDH17) is a sensitive (81%) and highly specific (100%) marker for metanephric adenoma, and CDH17 can be considered in the immunohistochemistry panel for distinguishing MA from its mimics[10].

The differential diagnosis of renal MA includes certain renal tumors such as papillary RCC and epithelial Wilm's tumor (WT). Papillary RCC is more common than MA, it accounts for about 10% of RCC. Pathologically, Papillary RCC cells were arranged in a papillary pattern with abundant oncocytic cytoplasm, and often showed stratification or pseudostratification. The nuclei can be large and hyperchromatic with nucleoli. Mitotic figures are evident. Psammoma bodies and hemosiderin positive for Prussian blue are scattered. Foamy cells are also found. Genetic studies showed that trisomies of chromosomes 7 and 17 is common, and loss of sex chromosomes can also be found. WT are three phase embryonic renal tumors composed by varying properties of blastemic, epithelial and mesenchymal cells with a high morbidity in children. MA is very difficult to be distinguished from epithelial type WT, but pithelial type WT is highly aggressive, mitotic figures were very often with a many atypia cells.

In brief, MA is an invariably benign renal tumor and the prognosis is favorable. But most MA had undergone nephrectomy in clinical practice. The biological behavior of MA was benign and always accompanied by a favorable outcome after nephrotomy or mass resection. But a MA case with metastases, presented in the periaortic,hilar and aortic bifurcation lymph nodes was reported in 2000 [11]. In another 11-year-old girl, metanephric adenoma containing foci of papillary carcinoma,had a regional lymph node contained metastatic deposits [12]. Another MA case with bone metastases also had been reported in 1999 [13].

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