CASE REPORT

Metanephric Adenoma: clinical, imaging, and Histological findings

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INTRODUCTION

Metanephric adenoma (MA), also designated nephrogenic nephroma or renal epithelial tumor resembling immature nephron, has just been recently recognized as a special type of benign renal epithelial tumor. Only few reports are found in the literature regarding this rare renal tumor. The purpose of this paper is to describe our clinical, imaging and histological / immunohistochemical observations of MA diagnosed in two patients and compare these data to previous information reported in medical databases.

CASE REPORT

The first case refers to a 70-years-old female patient, who except by systemic arterial hypertension was completely healthy. During routine examinations, a mass of 4.5 cm located on the lower third of her right kidney was incidentally found. At that time, the patient presented only low-grade fever and weakness for about two weeks. Abdominal ultrasonography (USG) showed hypoechoic mass with solid aspect and irregular limits. It was heterogeneous and exofitic, containing septation and cystic areas in its interior. Magnetic resonance imaging (MRI) showed a solid mass 5.2 cm for its higher dimension located in right kidney with same hemorrhagic foci and no sign of peri-renal invasion (Figure 1). Also, simple renal cysts were evidenced. The patient was submitted to a successful partial nephrectomy by open surgery, evolving uneventfully. Pathologic examination of surgical specimen revealed a firm lesion of light brown tissue with reticulated central area and clear delimitation from the adjacent parenchyma. Microscopic evaluation showed no cellular atypical or mitotic activity. Peri-renal adipose tissue was free from neoplastic invasion.

The second patient was a 23-year-old man with no previous heath problem, who presented with flank pain for one month. Abdominal USG showed a 4 x 4 cm nodular, solid and heterogenic lesion with hyperecogenic areas and exofitic characteristics in the lower third of right renal parenchyma. Computed tomography (CT) confirmed the presence of a 4 cm expansive tumoral formation with intermediate attenuation and minimum venous contrast enhancing at that anatomic site (Figure 2). Partial nephrectomy was again the therapeutic choice. The patient evolved well but an arterial-venous fistula clinically manifested by hematuria was diagnosed in post-operative (PO) day five. The fistula was successfully embolized by arteriography and no other complications occurred. Immunohistochemical study employing incubation of histological cuts with mono and polyclonal antibodies (panels) showed a profile focally and positive to WT-1, EMA and CK7.

Both patients are free of neoplastic disease with no signs of recurrence after 2 years of follow up.

DISCUSSION

MA is a renal tumor with benign behavior. The classification is based on a combination of histological, immunohistochemical, and genetic features. Most small MA tumors are well circumscribed, firm, and white; larger tumors may be hemorrhagic and softer.

The cytology of a few cases has been described1 and is composed of tight, short papillae and loose sheets of cells with scant cytoplasm, round nuclei, fine chromatin and rare small nucleoli. By analyzing all described findings at immunohistochemical and lectin histochemical studies, MA has shown reactivity for keratin (CK7 is the most common), CD 57, vimentin, S-100 protein, EMA, lysozyme,

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Figure 1 - MRI - solid mass 5.2 cm in higher dimension located in right kidney with same hemorrhagic foci and no sign of perirenal invasion
It seems that, presented the only reported case of a metastatic disease. Reporting one tumor found only at.

12 Similar fact was observed for performed partial nephrectomy for a 32 years old in 2004 for MA treatment in a 31 years old female.

In the biggest MA series reported, Bastide et al.,

Authors suggest a preoperative diagnostic biopsy, a partial nephrectomy or active surveillance. We believe, that biopsy should be reserved to cases where patient refuse or does not have clinical conditions for surgery or less invasive procedure shall be tried, such as cryotherapy.

It is possible to realize that MA treatment has evolved as well as others renal tumors approach, and partial nephrectomy should be remembered as an option (Table 1).

Table 1 - MA treatment evolution

| Author            | Year | Number of cases | Surgical Approach       |
|-------------------|------|-----------------|-------------------------|
| before 2000       |      |                 |                         |
| Kosugi 2000       | 1    | Open total nephrectomy      |
| Ebine 2004        | 1    | Laparoscopic total nephrectomy |
| Kumar 2007        | 1    | Laparoscopic partial nephrectomy |
| Bastide 2009      | 9    | 4 partial and 5 total nephrectomies |

Partial nephrectomy is indicated even to malignant tumors and even large masses (bigger than 4 cm) can be resected without prejudice to the oncological results. In 2000, Kosugi et al. performed partial nephrectomy for a 32 years old female patient who presented with a right renal MA of 1.5 cm at abdominal USG examination at a routine medical check up. Our two patients were also treated with partial nephrectomy, procedure with better renal function preservation, without compromising the patient’s survival.

Further advance in reducing patient morbidity may be achieved by laparoscopic nephrectomy as reported by Ebine et al. in 2004 for MA treatment in a 31 years old female patient with a left renal mass of 4.5 cm detected incidentally during an abdominal ultrasound examination. Three years latter, Kumar et al. reported a laparoscopic partial nephrectomy as treatment for MA in a 47-year-old patient.

In the biggest MA series reported, Bastide et al. performed four radical and five partial nephrectomies. In this paper, authors suggest a preoperative diagnostic biopsy, a partial nephrectomy or active surveillance. We believe, that biopsy should be reserved to cases where patient refuse or does not have clinical conditions for surgery or less invasive procedure shall be tried, such as cryotherapy.

Cytologic and fluorescence in situ hybridization (FISH) examination of metanephric adenoma. Diagn Cytopathol. 1997;16:107–11, doi: 10.1002/(SICI)1097-0339(199702)16:2<107::AID-DC2>3.0.CO;2-E.

Kato H, Suzuki M, Aizawa S and Hano H. Metanephric Adenoma of the Kidney with Massive Hemorrhage and Necrosis: Immunohistochemical, Ultrastructural, and Flow Cytometric Studies. International Journal of Surgical Pathology. 2003;11:545–52, doi: 10.1177/10668969031100418.

Renshaw AA, Freyer DR, Hammons YA. Metastatic metanephric adenoma in a child. Am J Surg Pathol. 2000;24:570–4.

Zafar N, Spencer D, Berry AD III. Embryonal adenoma of the kidney: A clinicopathological, immunohistochemical, flow cytometric, and electron microscopic study of seven cases. Am J Surg Pathol. 1995;19:615-26.

Araki T, Hata H, Asakawa E, Araki T. MRI of metanephric adenoma. J Comput Assist Tomogr. 1998;22:87–90, doi: 10.1097/00004728-199801000-00016.

Nonomura A, Mizukami Y, Hasegawa T, Okhawa M, Kadoya M. Metanephric adenoma of the kidney. Pathol Int. 1995;45:180–3, doi: 10.1111/j.1440-1827.1995.tb06357.x.

Jones EC, Piris M, Dickens WR, Young RH. Metanephric adenoma of the kidney: A clinicopathological, immunohistochemical, flow cytometric, cytogenetic, and electron microscopic study of seven cases. Am J Surg Pathol. 1995;19:615-26.

Araki T, Hata H, Asakawa E, Araki T. MRI of metanephric adenoma. J Comput Assist Tomogr. 1998;22:87–90, doi: 10.1097/00004728-199801000-00016.

Fielding JR, Visweswaran A, Silverman SG, Granter SR, Renshaw AA. CT and ultrasound features of metanephric adenoma in adults with pathologic correlation. J Comput Assis Tomo. 1999;23:441–4, doi: 10.1097/00004728-199905000-00020.

Bastide C, rambeaud JJ, Bach AM, Russo P. Metanephric adenoma of the kidney: clinical and radiological study of nine cases. BJU Int. 2009;103:1544-8, doi: 10.1111/j.1464-410X.2009.08357.x.

Kosugi M, Nagata H, Nakashima J, Murai M, Hata J. A case of metanephric adenoma treated with partial nephrectomy. Japanese Journal of Urology. 2000;91:489-92.
11. Ebine T, Ohara R, Momma T, Saito S, Kuramochi S. Metanephric Adenoma Treated with Laparoscopic Nephrectomy. International Journal of Urology. 2004;11:232–34, doi: 10.1111/j.1442-2042.2003.00771.x.

12. Kumar S, Mandal AK, Acharya NR, Kakkad N, Singh SK. Laparoscopic nephron-sparing surgery for metanephric adenoma. Surg Laparosc Endosc Percutan Tech. 2007;17:573-5, doi: 10.1097/SLE.0b013e3181568389.