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**Case Report**

# Metanephric adenoma of kidney: a rare and distinct entity

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## ABSTRACT

Metanephric adenoma (MA) is an unusual renal neoplasm with benign behaviour most of the times. Clinically MA mimics malignant renal neoplasms due to nonspecific signs and symptoms such as polycythaemia, haematuria and abdominal pain. MA usually presents as a mass lesion on radiographic studies and can be found incidentally. The treatment of choice is surgical excision. Though MA is usually a benign tumour, increase in the knowledge of MA pathology may lead to less invasive treatments in the future. Less than 200 cases of metanephric adenoma are reported till date in the literature.

**Keywords:** Metanephric adenoma, Benign, Surgical excision

## INTRODUCTION

Metanephric adenoma(MA) is very rare neoplasm accounting for <0.2% of adult renal epithelial neoplasms.[1-5] According to WHO classification of renal tumours, metanephric adenoma, metanephric adenofibroma and metanephric stromal tumour forms metanephric group of renal neoplasms.[6] Less than 200 cases of metanephric adenoma are reported till date in the literature.[2,5] Metanephric adenoma, first described by Bove et al is a recently characterized benign cortical renal tumor.[3] This tumour commonly affects patients in $6^{th}$-$7^{th}$ decades of life with slight female preponderance.

We report a case of metanephric adenoma in a 57 year old female patient.

## CASE REPORT

A 57-year-old female presented to surgical OPD with pain in right loin region since 3 months and facial oedema since 1 month. There was no history of haematuria, burning micturition or fever. Renal function tests were within normal limits.

CT scan of abdomen-pelvis was carried out for the evaluation of loin pain which showed a large 5.7x4.9 cm well circumscribed mass lesion in lower portion of right kidney with modest heterogeneous contrast enhancement (Figure 1). Possibility of angiomyolipoma and renal cell carcinoma was raised on radiology findings.

Patient underwent right radical nephrectomy and specimen was sent for hisopathological examination.

On gross examination, right kidney showed a tumour on lower pole measuring 5.5x5cm. Tumour was well circumscribed with homogenous greyish white appearance on cut surface without haemorrhage or necrosis (Figure 2). Microscopy revealed well circumscribed highly cellular tumour showing tightly packed tubular structures with minimum intervening stroma (Figure 3a and 3b). Tumour cells were monotonous with small round oval uniform nuclei showing focal nuclear grooves (Figure 3c and 3d). Mitotic activity was nil with absence of haemorrhage or necrosis.

Based on this characteristic histomorphology the diagnosis of metanephric adenoma was given.

Patient has been followed up for 12 months without any recurrence.

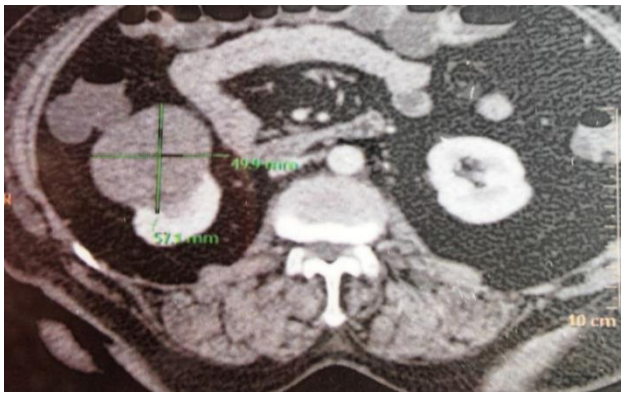

**Figure 1: CT scan showing large 5.7x4.9 cm well circumscribed mass lesion in right kidney with heterogeneous contrast enhancement.**

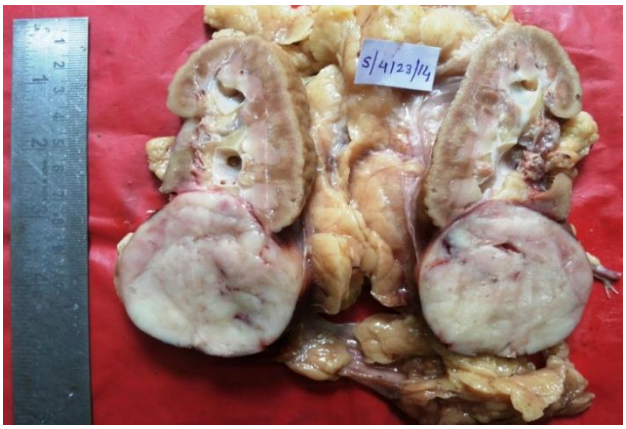

**Figure 2: Gross morphology showing a well circumscribed homogeneous grey white tumour measuring 5.5x5 cm in right kidney, without haemorrhage or necrosis.**

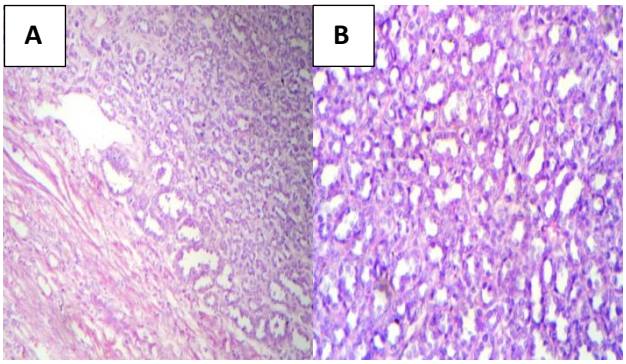


**Figure 3 A & B: Microscopy showing highly cellular tumour arranged in small tightly packed tubules with scant intervening stroma, well demarcated from surrounding unremarkable renal parenchyma with absence of haemorrhage or necrosis (HE X 40, HE X 100)**

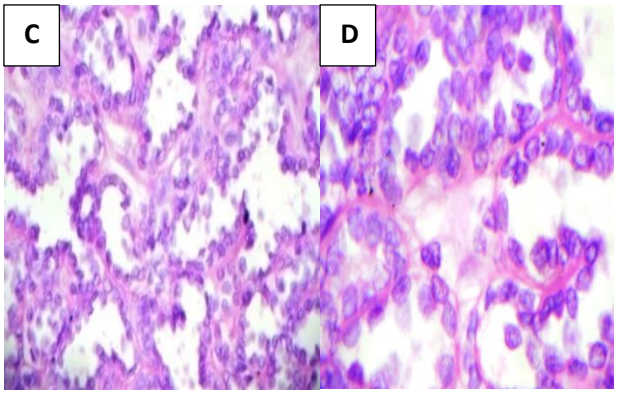


**Figure 3 C & D: The tumour cells were monotonous with small round oval uniform nuclei showing focal nuclear grooves, focal papillary architecture and no mitotic activity (HE X 400).**

## DISCUSSION

Metanephric adenoma is a rare benign neoplasm of kidney which can mimic many malignant renal tumours clinically and histopathologically.

Clinically metanephric adenoma commonly presents as abdominal mass, flank pain and haematuria but often these tumours can be found incidentally on imaging studies.[1,7] Occasionally these tumours are responsible for paraneoplastic syndrome such as polycythemia.[3,7,8]

Radiological studies mostly reveal well circumscribed mass lesion in kidney. Metanephric adenoma on USG shows hypoechoic lesion but some authors have found MA to be hyperechoic. On CT, MA show non-distinct mass with low attenuation but this tumour has been described to show contrast enhancement occasionally. It is clear that, metanephric adenoma cannot be differentiated from other renal masses as there are no specific definitive radiologic findings.[2-4,9]

On gross examination, size of MA ranges from 0.6-20 cm.[3,9] MA is usually well circumscribed but un-encapsulated with no extra-renal extension and tan to grey color on cut surface.

Microscopically MA is a highly cellular neoplasm composed of small epithelial cells forming compact tubules or small acini.[4,8,10] The cells are uniform with round to oval nuclei showing nuclear grooves with inconspicuous nucleoli and scant cytoplasm. The tumor cells may proliferate to form glomeruloid bodies with papillary projections. Stroma is usually acelluar, edematous which may show myxoid degeneration. Calcification in the form of psammoma bodies may be present. MA usually lacks atypia and mitoses however in rare cases atypical features like absence of characteristic tubular architecture or glomeruloid bodies, presence of atypia or mitoses may be present.[10] Metanephric adenoma in these cases can mimic other malignant renal

neoplasms, thus it is important to distinguish MA from malignant renal neoplasms such as Wilms tumour (WT) in children and papillary renal cell carcinoma (PRCC) in adult patients. In present case such atypical features were absent.

Absence of blastemal elements and nephrogenic rests will help to distinguish MA from WT. PRCC is usually distinguished from MA on histomorphology. Basophilic variant of solid PRCC may resemble MA due to presence of scant cytoplasm as seen in MA, focal cytoplasmic clearing as well as abundant eosinophilic to amphophilic cytoplasm in PRCC helps in differentiation.[11]Also nuclear overlapping due to scant cytoplasm seen in MA is characteristic.[11]Also PRCC shows foamy histiocytes which are not seen in MA. Difference between solid PRCC and MA is described by Pins et al.[11]

Immunohistochemically, MA is usually positive for CD57 and occasionally for WT1 antigen however these tumors are negative for CK7and CK17 which can help in differentiating MA from PRCC.[9,12]

Cytogenetic analysis in various studies revealed lack of gains of chromosome 7 and 17 and lack of loss of Y chromosome which are frequently seen in PRCC. These studies carried out by FISH can be useful in diagnosis of MA with extensive papillary architecture from PRCC.[11,12] Cytogenetic analysis of present case showed normal karyotype with no gains of chromosome 7 and 17 or no loss of Y chromosome .

MA is usually treated by total or partial nephrectomy, however surgical enucleation is also justifiable.[2,3] Follow up is short and not well documented in the literature however distant metastasis after 46 months of follow up post-surgery has been described.[2,10]

## CONCLUSION

MA is a rare distinct benign tumor which can mimic other benign and malignant tumors. Thus it is important to have knowledge about it to prevent unnecessary extensive treatment as MA treated with complete or partial nephrectomy has an excellent prognosis.

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