

Solid Tumour Section

Short Communication

Kidney: Metanephric adenoma

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Abstract

Review on Kidney metanephric adenoma a, with data on clinics, and the genes involved.

Keywords

Metanephric adenoma of the Kidney; BRAF

Identity

Other names

Embryonal adenoma, Nephrogenic nephroma

Phylum

Urinary system: Kidney: Adult: Adenoma:
Metanephric adenoma

Note

A benign renal epithelial tumor resembling differentiation toward early embryonic metanephric tubules.

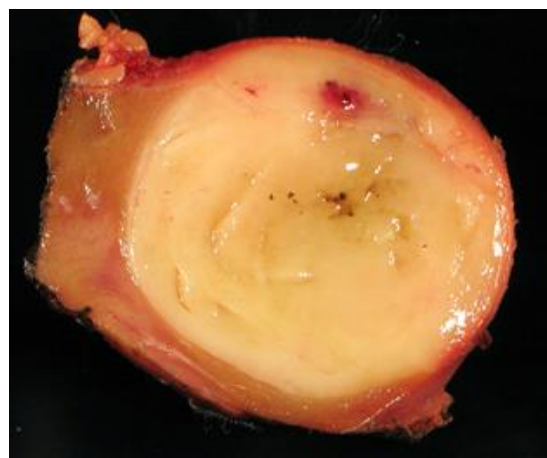


Figure 1A Metanephric adenomas are typical, small, well circumscribed with a fleshy tan cut surface (Kelsey McIntyre and Michelle S. Hirsch).

Figure 1B Histologically, the tumor cells are small, monomorphic and cuboidal. Architecturally, the tumors can demonstrate tubular (predominant), papillary and glomeruloid growth patterns (courtesy Chin-Chen Pan).

Classification

Metanephric adenoma belongs to the category of Metanephric tumor in the WHO histological classification of tumors of the kidney.

Clinics and pathology

Etiology

Although previously suggested to be derived from persistent blastema, metanephric adenoma is currently thought to develop from maturation of nephroblastoma.

Epidemiology

Metanephric adenomas are rare (<1% of renal epithelial neoplasms) but occur across a wide range of patients, from infants to older individuals.. The peak age frequency is 40 to 69 years. There is a female predominance (2.3:1). Ten percent of patients present with polycythemia.

Clinics

Mostly metanephric adenomas are incidentally discovered. Some patients present with hematuria and abdominal or flank pain.

Pathology

Grossly, metanephric adenomas demonstrate a tan to fleshy white homogeneous cut surface (Fig. 1A) (Grignon et al., 2016). Most tumors are well-demarcated but lack a true capsule and are typically unilateral. Microscopically, the tumor is highly cellular and chiefly composed of tightly packed primitive tubules; papillary or glomeruloid structures may also be seen. The individual tumor cells are small, bland and cuboidal with scant cytoplasm, and round-to-oval nuclei with smooth chromatin, and inconspicuous nucleoli (Fig. 1B). Stromal hyalinization, dystrophic calcification and psammoma bodies are occasionally seen. Metanephric adenomas may resemble nephroblastoma or papillary renal cell carcinoma microscopically. Mitotic figures are rare or absent; necrosis is not seen. Tumor cells are immunoreactive for WT1, PAX8 and BRAF, and are typically negative for CK7 and AMACR.

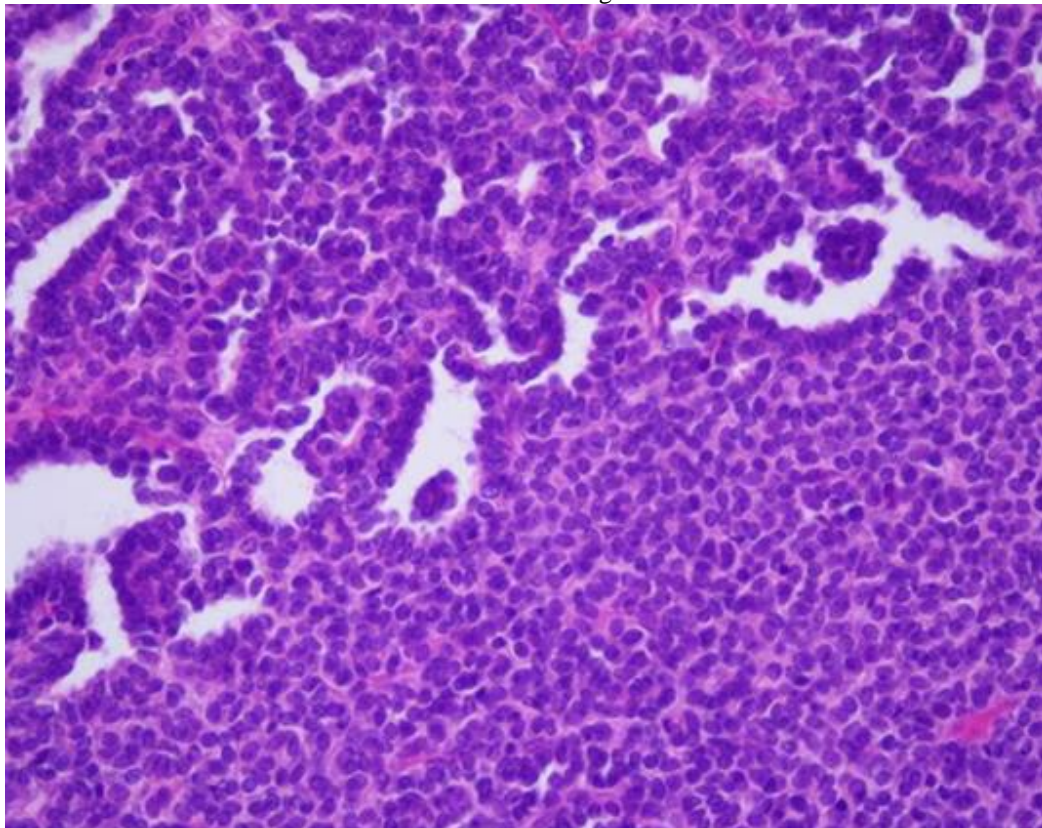


Figure 1B Histologically, the tumor cells are small, monomorphic and cuboidal. Architecturally, the tumors can demonstrate tubular (predominant), papillary and glomeruloid growth patterns (courtesy Chin-Chen Pan).

Treatment

Surgical excision.

Prognosis

The vast majority of metanephric adenomas behave in a benign fashion. Cases of regional lymph node metastasis and sarcomatoid changes have been individually reported.

No consistent cytogenetic abnormalities have been identified in metanephric adenoma. The gains of chromosomes 7 and 17 noted in papillary renal cell carcinoma, as well as the chromosome gains of 1q, 7q, and 12, and losses of 11p and 16q commonly seen in Wilms' tumor have not been detected in metanephric adenoma.

Cytogenetics

Genes involved and proteins

Approximately 90% of metanephric adenomas contain a V600E activating mutation in exon 15 of BRAF (Choueiri et al., 2012). BRAF-mutated metanephric adenomas stain positive for V600E mutation-specific immunohistochemistry (Pinto et al., 2015; Udager et al., 2015). BRAF mutations are very rare (<1%) or absent in other renal tumor subtypes.

BRAF (v-raf murine sarcoma viral oncogene homolog B1)

Location

7q34

Note

BRAF V600E mutations are found in approximately 90% of metanephric adenomas.

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