Updates in Benign Lesions of the Genitourinary Tract

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• Renal tumors • Urinary bladder pathology • Prostate pathology • Testis pathology
• Benign neoplasms

ABSTRACT

The genitourinary tract is a common site for new cancer diagnosis, particularly for men. Therefore, cancer-containing specimens are very common in surgical pathology practice. However, many benign neoplasms and nonneoplastic, reactive, and inflammatory processes in the genitourinary tract may mimic or cause differential diagnostic challenges with malignancies. Emerging clinicopathologic, immunohistochemical, and molecular characteristics have shed light on the pathogenesis and differential diagnosis of these lesions. This review addresses differential diagnostic challenges related to benign genitourinary tract lesions in the kidney, urinary bladder, prostate, and testis, with emphasis on recent advances in knowledge and areas most common in diagnostic practice.

KIDNEY

MIXED EPITHELIAL AND STROMAL TUMOR AND CYSTIC NEPHROMA

Introduction

Mixed epithelial and stromal tumors (MESTs) of the kidney and cystic nephroma are benign renal tumors composed of a mixture of cysts and spindle cell stroma, both of which occur predominantly in adult women.[1–7] In light of the female predilection[8] of both tumors, immunohistochemical positivity for estrogen and progesterone receptors (greater in MESTs),[9] foci of overlapping morphology, and areas reminiscent of ovarian-type stroma in both tumors (although greater in MESTs), it has been debated whether these tumors should be considered a spectrum of a single entity or unique neoplasms. As such, the term, *renal epithelial and stromal tumor*, has been proposed by some investigators to encompass both lesions.[7] In most cases, however, classification into 1 of the 2 categories is readily achievable.[8] Although it was previously hypothesized that only the stroma is neoplastic,[10] recent molecular evidence suggests that the epithelium and stroma are both neoplastic in MESTs.[11] In the pediatric age group, tumors previously classified as cystic nephromas are currently thought best regarded as cystic partially differentiated nephroblastomas (Wilms tumors), in which areas of morphologically apparent nephroblastoma may be scant.

Gross Features

Grossly, cystic nephroma forms a circumscribed mass, often located centrally within the kidney, composed entirely of cysts with thin fibrous septa separating the cystic cavities. Some investigators have found this septal thickness consistently less than 5 mm, in line with the absence of a solid component in these tumors.[7] In contrast, MEST forms a solid and cystic renal mass, and in some cases, the solid component may be predominant, raising diagnostic suspicion for another subtype of solid mesenchymal neoplasm.[7]

Microscopic Features

Microscopically, heterogeneous cyst lining epithelium may show a variety of patterns in both tumors, including flattened, hobnail-like, cuboidal,

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columnar, or urothelial-like lining cells.[1,7] The stroma has also been reported to show a spectrum of morphologies, including areas that range from hypocellular and collagenous to more cellular, composed of spindle-shaped cells or smooth muscle-like cells.[1,7] Foci resembling ovarian stroma have been described in both tumors (**Fig. 1**A). Stromal cellularity, however, is generally low in cystic nephroma, with a greater predominance of hypocellular, collagenous stroma. Entrapped tubules may be seen in some of the septae. In MESTs, the epithelial elements also vary substantially in size, ranging from small clusters of tubules (see **Fig. 1**B) to larger cystic spaces. In MEST, stroma sometimes invaginates into epithelial structures, forming large polypoid phyllodes tumor-like papillary structures (**Fig. 2**A). Immunohistochemically, the stromal cells are often positive for estrogen (see **Fig. 2**B) and progesterone receptors, and some positivity has been reported for CD10, calretinin, and inhibin, generally greater in MESTs than in cystic nephroma.[1,3,7] Stromal cells are also typically positive for smooth muscle actin,[1,3] and in MESTs there is often substantial stromal positivity for desmin,[1] even sometimes in areas without overt

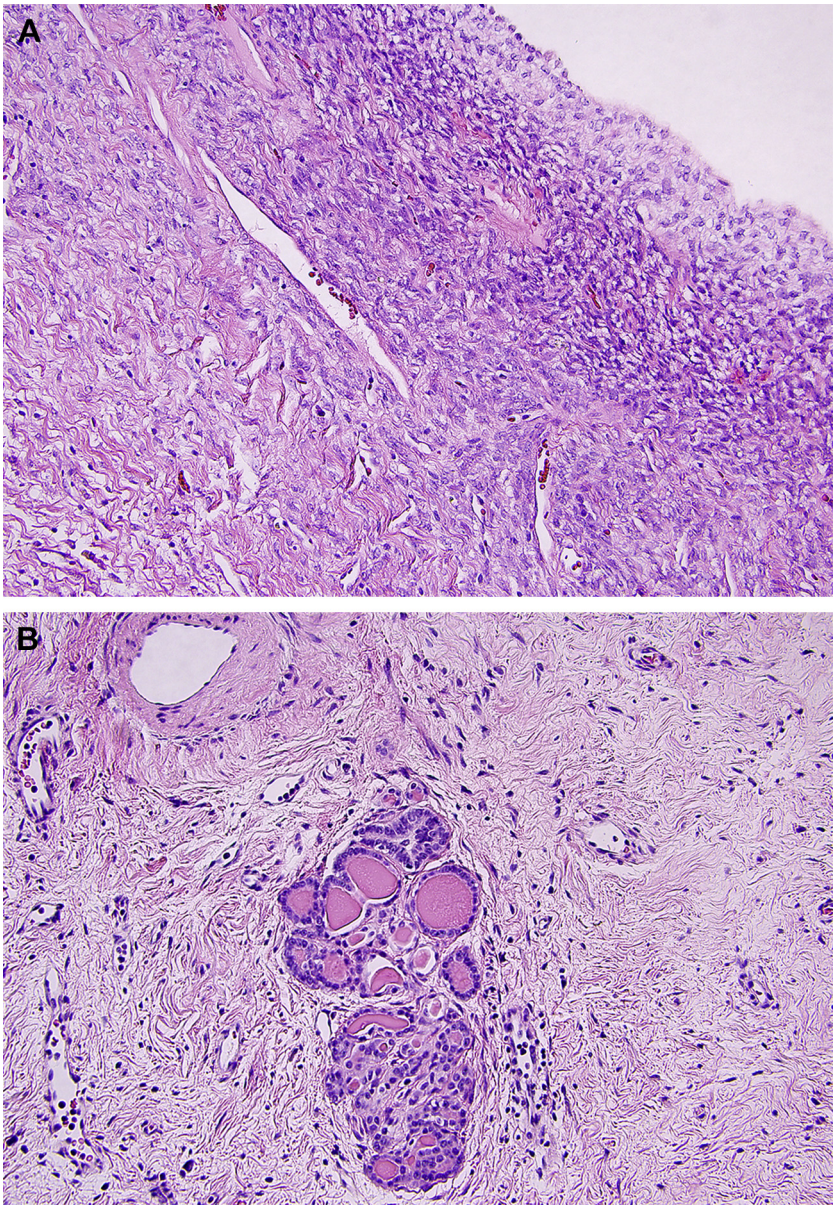

Fig. 1. MESTs of the kidney may contain (*A*) large cystic structures with condensation of ovarian-like stroma just under the lining epithelium or (*B*) smaller clusters of renal tubular elements in solid areas of fibrous or cellular stroma (H&E stain, original magnification ×20).