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Radiologic-pathologic findings of solitary fibrous tumor of the prostate presenting as a large mass with delayed filling-in on MRI

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We report a case of a solitary fibrous tumor of prostate presenting with urinary retention and a large prostate mass. We describe the clinical presentation, magnetic resonance imaging findings, and histopathology of this rare, benign tumor. Although clinical and radiologic appearances embrace various differential diagnoses including sarcoma, this mass was confirmed by histologic analysis following surgical resection. We report this rare, benign tumor to help the radiologist suggest the diagnosis when presented with a similar case.

Case report

A 37-year-old male presented to the hospital with urinary retention. A smooth, firm, and enlarged prostate was palpated on digital rectal examination. A Foley catheter was placed to relieve urinary retention. Ultrasound showed a markedly enlarged prostate (not shown). Subsequently, an ultrasound-guided biopsy was performed with a resultant benign histology. MRI of the prostate with contrast was performed for surgical planning; it showed a 10.5-x-8.5-cm, well-circumscribed, slightly lobulated mass replacing the prostate gland. The mass was diffusely hyperintense on T1-weighted images (Fig. 1) and mildly hyperintense on T2-weighted images, with few nonspecific hypointense foci on the T2-weighted images (Fig. 2). On contrast administration, there was a gradual enhancement from the periphery to the center (Fig. 3). The neurovascular bundles were normal. Enlarged pelvic lymph nodes were not identified, and the marrow signal in the pelvic bones was normal.

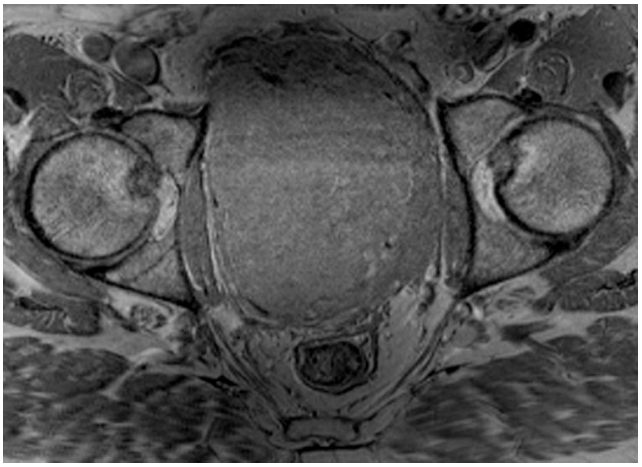

Figure 1. 37-year-old male with solitary fibrous tumor of the prostate. Axial T1-weighted image demonstrates large, isointense mass replacing entire prostate.

The needle-core biopsies showed spindle-cell proliferation with hypercellularity in some areas and hypocellularity in other areas. There were areas of neoplastic cells sepa-

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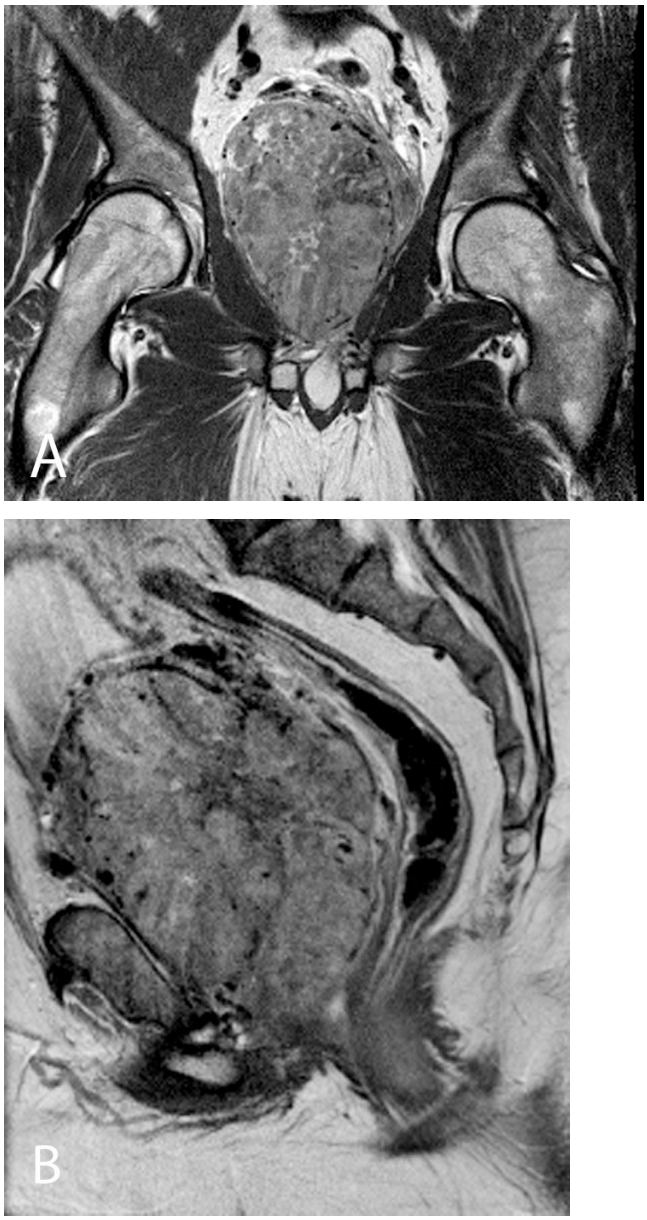

Figure 2. 37-year-old male with solitary fibrous tumor of the prostate. Coronal (A) and sagittal (B) T2-weighted images reveal large, mildly heterogeneous mass with nonspecific hypointense foci, which displaces rectum posteriorly.

rated by thick bands of collagen, demonstrating foci of keloid-like hyalinization (Fig. 4). The neoplastic cells were positive for CD34 and negative for c-kit. Also, neoplastic cells were reported to express vimentin and were negative for keratin, desmin, actin, S-100, and progesterone receptor. These findings are characteristic of solitary fibrous tumor (SFT).

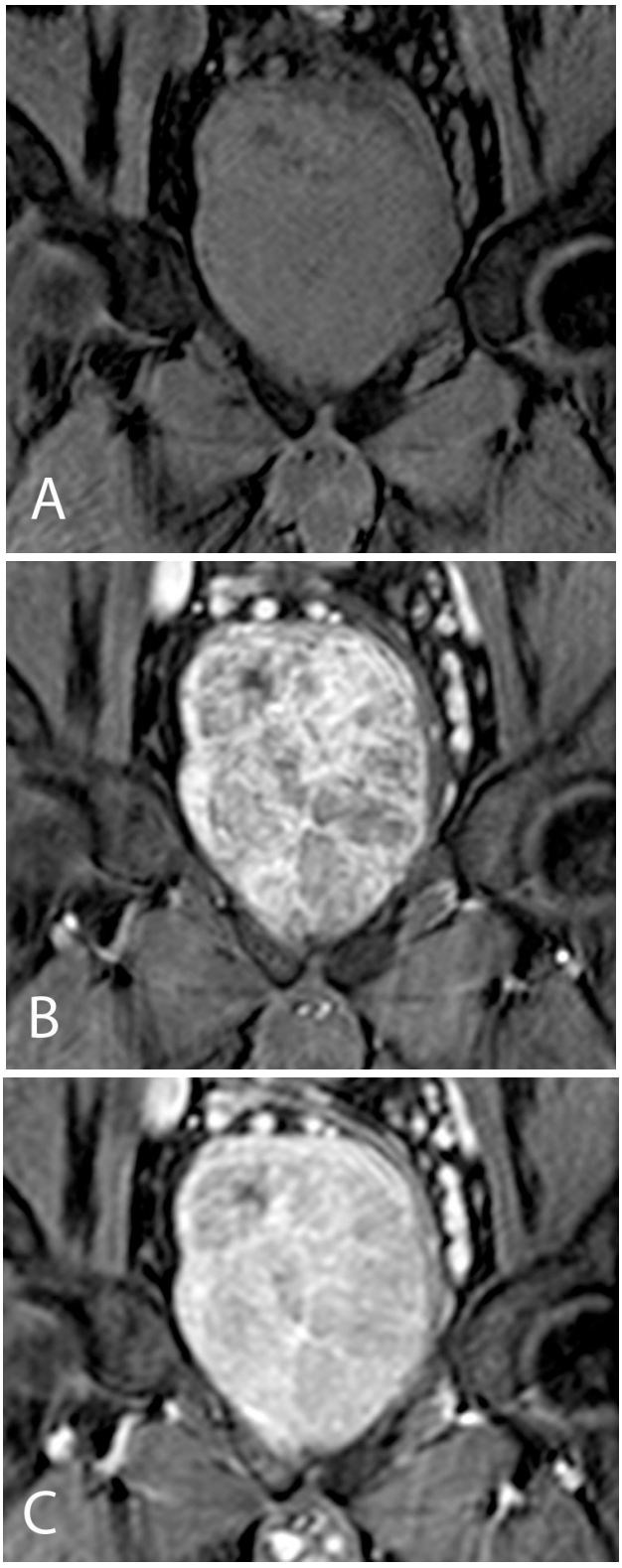

Figure 3. 37-year-old male with solitary fibrous tumor of the prostate. Coronal, breath-hold, 3D, T1-weighted, noncontrast (A), early arterial (B), and delayed (C) high-resolution isotropic volume examination (THRIVE) show gradual enhancement of this mass from periphery to center.

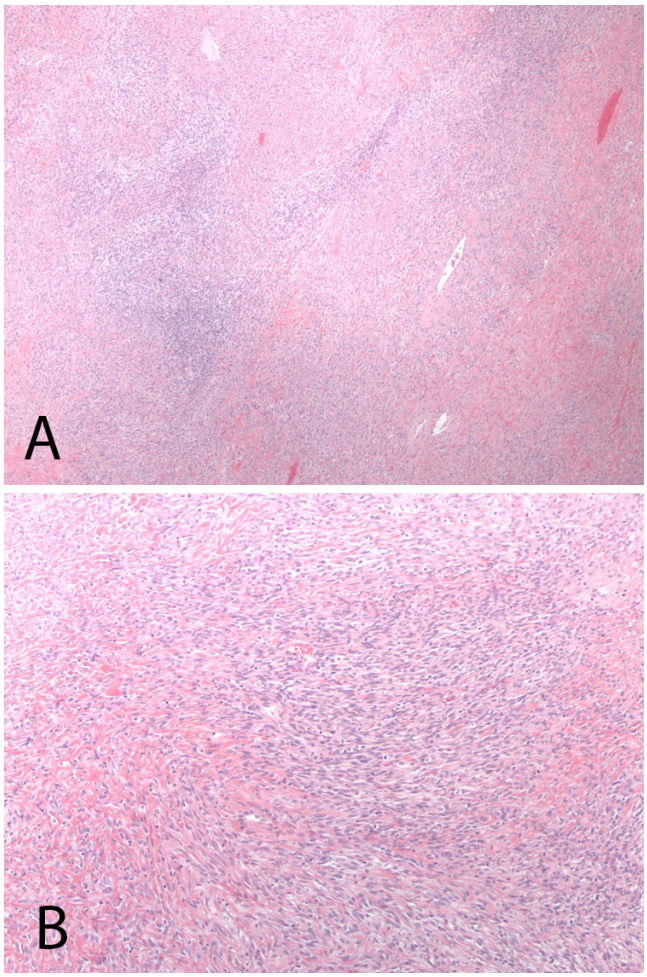

Figure 4. 37-year-old male with solitary fibrous tumor of the prostate. Hematoxylin-eosin stain with magnification of 40X (A) and 100X (B) shows spindle-cell proliferation with hypercellularity in some areas and hypocellularity in other areas. Neoplastic cells are separated by thick bands of collagen, demonstrating foci of keloid-like hyalinization. There is minimal nuclear atypia and mitotic activity. No necrosis or lymphovascular invasion is identified. These features, along with the typical immunohistochemistry, are characteristic of solitary fibrous tumor of the prostate.

Discussion

SFTs are rare, benign tumors derived from mesenchymal cells; most commonly, they arise from visceral pleura and less commonly from other serosal surfaces such as the lung, upper respiratory tract, nasal cavity and paranasal sinuses, thyroid, orbits, mediastinum, major salivary glands, breast, meninges, kidney, renal capsule, liver, spermatic cord, and soft tissues (1). Fewer than 20 cases of SFT of the prostate and four additional cases originating from the periprostatic Denonvilliers fascia have been described. Their most common clinical findings include urinary frequency, dysuria, and hypoglycemia (2).

SFT of the prostate usually presents as a nodule on rectal examination. The peripheral location of the lesion and its solid hypoechoic appearance on transrectal ultrasound (TRUS) result in its often being confused with prostatic carcinoma (3). These lesions are usually hypointense to muscle on both T1- and T2-weighted MR images. Larger lesions can have heterogeneous T2 signal. Lee et al. (4) suggested that this variable signal intensity on T2-weighted images depends mainly on differences in the main components of the tumor, namely, the amount of collagen and fibroblasts, and on the presence of degeneration. A gadolinium-enhanced dynamic study can show gradual enhancement from the periphery to the center, and the enhancement is usually sustained (5).

The differential considerations include leiomyosarcoma, fibrosarcoma, carcinosarcoma, phylloides tumor, and hemangiopericytoma. Whil imaging with ultrasound and MRI accurately identifies these lesions, biopsy and immunohistochemical markers are mainstays for a final pathological diagnosis. SFTs histologically have a "patternless pattern" of uniform spindle cells. A combination of different histological patterns (patternless, storiform, fascicular, neural-type, diffuse sclerosing, and herringbone growth patterns) is even more characteristic of SFT. No single specific immunohistochemical marker is diagnostic; however, positivity for vimentin, CD34, and CD99 is specific and helps exclude alternative diagnoses (1, 5, 6).

Because of rarity of this disease entity, little is known about its clinical behavior and natural history. Although many SFTs are believed to be benign, some may have a malignant component. In general, a SFT without malignant component has a favorable clinical course, and therefore surgical treatment is usually adequate. However, those tumors that are greater than 10 cm and have a histologically malignant component have a worse clinical outcome and deserve close followup (7).

This report adds to the limited number of reported cases of SFT of prostate and describes the imaging appearance in MRI. MRI can play an important role in determining the exact location and extent of this tumor. Knowledge of this rare benign tumor may help radiologists to include this rare entity in their diagnosis when presented with a similar case.

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