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Incidental periprostatic schwannoma discovered during evaluation for prostatic adenocarcinoma

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ABSTRACT

Schwannomas of the prostate are exceedingly rare. We present a noteworthy case of a sporadic prostatic schwannoma diagnosed in conjunction with prostatic adenocarcinoma.

A 60-year-old male presented with mild lower urinary tract symptoms and a prostate specific antigen (PSA) level of 4.84 ng/mL. A transrectal ultrasound guided prostate biopsy revealed multifocal Grade Group 2 prostate cancer. MRI demonstrated a PI-RADS 4 lesion and a periprostatic cystic lesion. Prostatectomy was performed. Final pathology demonstrated prostatic adenocarcinoma, with a separate periprostatic schwannoma. We present the first case in the literature of a sporadic periprostatic schwannoma discovered during evaluation for prostatic adenocarcinoma.

Introduction

Schwannomas are benign tumors of the peripheral nerve composed of Schwann cells. In the sporadic form, they are most often observed as solitary masses distributed among soft tissues or spinal nerve roots.[1] Schwannomas of the prostate are exceedingly rare, with few cases reported in conjunction with neurofibromatosis, and even fewer reported in sporadic form.[2–5] Furthermore, none have been observed to arise synchronously with prostatic adenocarcinoma. Herein we report the first case of a sporadic periprostatic schwannoma discovered during evaluation for prostatic adenocarcinoma.

Case presentation

A 60-year-old male had been followed by his local urologist for mild lower urinary tract symptoms (LUTS) and a rise in PSA (<4.0 ng/mL to 4.84 ng/mL in 1 year). At that time, his prostate-health index was 37.24 and he reported intermittent testicular discomfort. A complete physical exam including digital rectal examination and metabolic panel were within normal limits. Family history was pertinent for a father with bladder cancer. He was scheduled for a transrectal ultrasound (TRUS) guided prostate biopsy.

TRUS revealed a prostate of 60 cc, intact capsule, nodularity in the transition zone suggestive of benign prostatic hyperplasia, and no other abnormalities. A 12-core prostate biopsy was performed. Pathology revealed Grade Group (GG) 2 prostatic acinar adenocarcinoma in the left apex, left mid, and left base, and GG1 disease in the right apex and right mid gland with perineural invasion. The patient subsequently underwent multiparameter magnetic resonance imaging (MRI) of the prostate, which revealed a 67 cc prostate. In the left posteromedial peripheral zone, a 9 × 6 mm PI-RADS 4 lesion with abnormal signal was noted on T2 and ADC maps with blurring of the adjacent capsule and abutting of the left neurovascular bundle (Fig. 1A and B). Additionally, a 3.3 x 3.5 × 3.4 cm periprostatic well-circumscribed cystic lesion with an enhancing solid component demonstrated mass effect on the seminal vesicle and prostate with no evidence of invasion (Fig. 1C and D). Pre-operative differential diagnoses included stromal tumor with unknown malignant potential versus an exophytic hyperplastic prostate nodule. Therefore, surgery was planned, and the cystic lesion was to be addressed intraoperatively. The patient subsequently underwent robot assisted laparoscopic radical prostatectomy with bilateral lymph node dissection and en bloc removal of the cystic lesion without complication.

Gross examination of the prostate revealed a lobular cut surface and a 2.5 × 2.5 cm solid and cystic mass predominantly involving the left posterolateral base. Routine Hematoxylin and Eosin (H&E) stained sections of the prostate revealed two organ confined foci of prostatic acinar adenocarcinoma, both Gleason score 3 + 4 = 7 (GG2), with a final pathologic stage of pT2 pN0 (Fig. 2A). Representative H&E sections of

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the solid and cystic mass revealed an unencapsulated, but well-circumscribed spindle cell neoplasm centered in the periprostatic tissue (Fig. 2B and C). The neoplasm displayed variation in cellularity and consisted of cytologically bland elongated spindle cells with ill-defined cytoplasmic borders, elongated and wavy nuclei, and variably tapered nuclear ends (Fig. 2D–F). There was no significant nuclear pleomorphism or mitotic activity. Immunohistochemical stains performed on the spindle cell neoplasm demonstrated diffuse, strong nuclear and cytoplasmic labeling for S100, and diffuse weak to moderate nuclear labeling for SOX-10 (Fig. 2G–I). The overall morphologic features and immunohistochemical profile supported a final diagnosis of periprostatic schwannoma. At the time of this report, the patient has not experienced a recurrence of either the prostatic adenocarcinoma or schwannoma.

Discussion

The differential diagnosis of prostatic and periprostatic lesions is broad. Neoplastic, inflammatory, and congenital processes, ranging from benign cystic lesions to periprostatic stromal sarcomas, must all be considered. This broad variety of diagnoses translates to largely variable prognoses and treatment pathways. However, it is difficult to diagnose such lesions based on imaging findings alone, and definitive diagnosis should be made with histopathological examination. While uncommon, schwannoma must be considered if a well-circumscribed, hypoechoic, or cystic lesion is observed on prostatic MRI or ultrasound.

Sporadic schwannomas of the genitourinary system remain extremely rare, with documented cases arising in the penis, spermatic cord, testis, or prostate.[5] When associated with neurofibromatosis, the urinary bladder is the most commonly involved genitourinary organ in the form of neurofibroma.[1] This patient presented with a sporadic schwannoma with no history of neurofibromatosis and a concurrent diagnosis of prostatic adenocarcinoma.

This case offered many unique features. For one, the location of the schwannoma was atypical. Previous cases of prostatic schwannoma have largely been located centrally within the prostatic tissue, while this lesion was discovered within the periprostatic fascia, most likely arising from posterolateral periprostatic neurovascular bundle (Table 1). Similarly, 3/4 (75%) of previous sporadic cases were discovered due to disabling LUTS. This patient was only mildly symptomatic at presentation, and the investigation was prompted by a rise in PSA. This variation in presentation may be in part due to the location of the schwannoma. Given this mass was peripheral and periprostatic, obstructive symptoms would have been unlikely. Furthermore, adding to the rarity of this case was the presence of a synchronous primary prostate cancer.

The incidental nature of this case raises the question of the ideal treatment for asymptomatic and benign prostatic and periprostatic tumors. While surgery is indeed curative—and in this case necessary owing to the prostatic adenocarcinoma—it is not without morbidity and decreased sexual quality of life. The rate of malignant transformation for schwannomas is exceedingly rare, and there has been demonstration of simple observation for an asymptomatic prostatic schwannoma.[2] It is plausible that local resection would offer durable control while preserving erectile function; providing an option to avoid complete resection for patient preference. Therefore, shared decision-making would provide the optimal course of action between the patient and physician.

Conclusion

We report the first case of a periprostatic schwannoma discovered during evaluation for prostatic adenocarcinoma. Without adequate characterization available from clinical presentation or imaging, definitive diagnoses of prostatic masses must rely on histopathology, as sporadic prostatic schwannomas comprise a diagnostic possibility and may alter clinical decision-making.

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Declaration of competing interest

None.

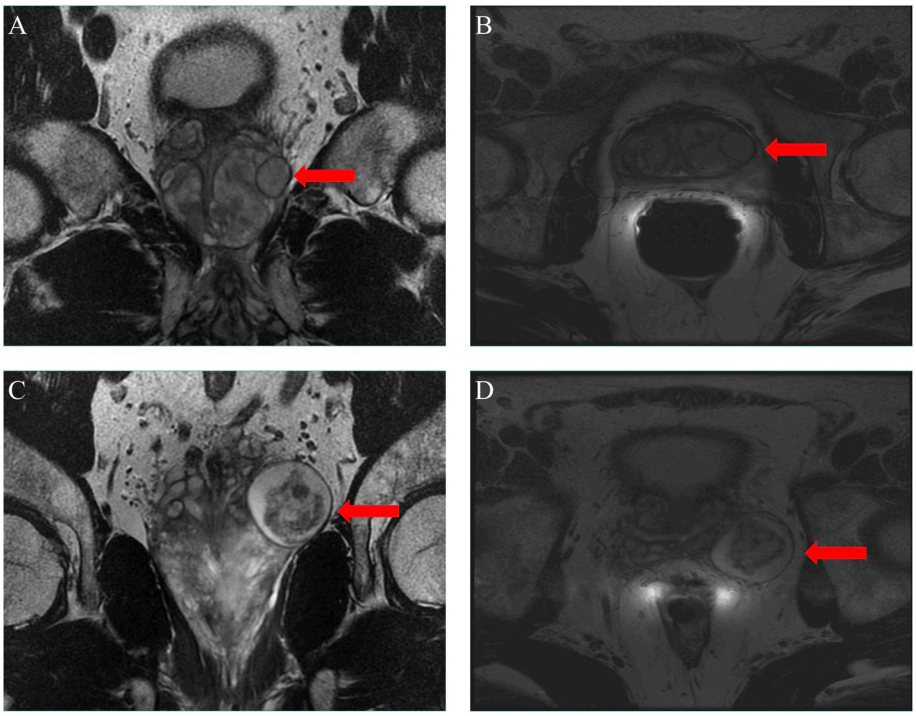

Fig. 1. Coronal (A) and axial (B) T2 weighted MRI of PI-RADS 4 adenocarcinoma. Coronal (C) and axial (D) T2 weighted MRI of periprostatic cystic lesion.

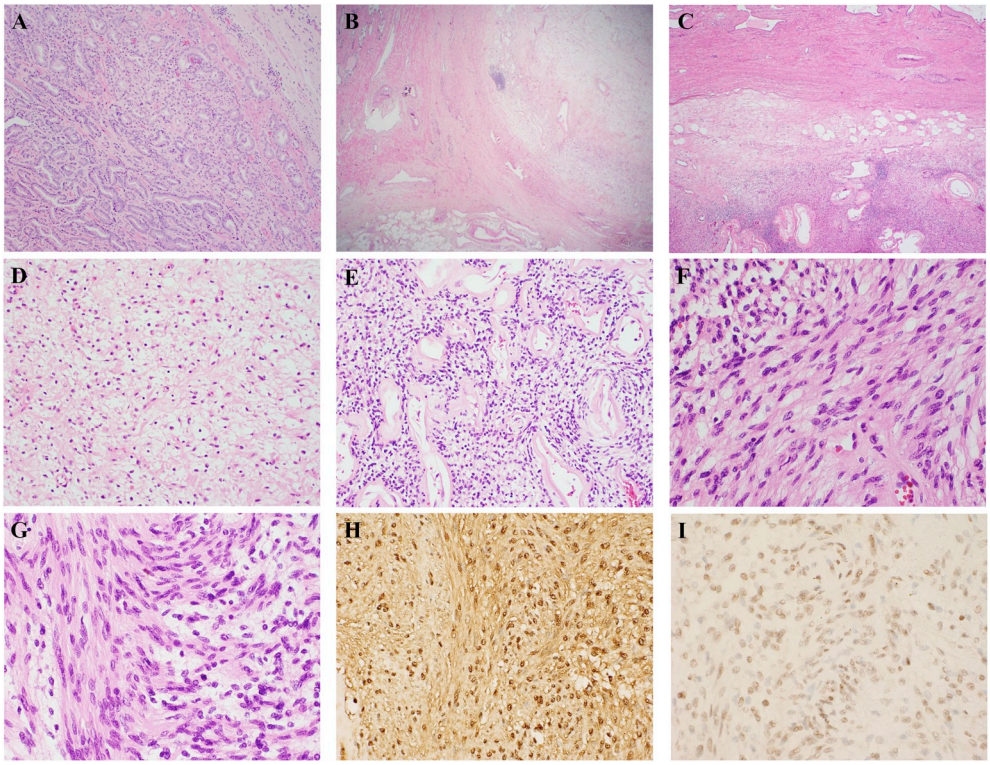

Fig. 2. A) Representative focus of prostatic acinar adenocarcinoma, Gleason score 3 + 4 = 7 (Grade Group 2). B) 2.5 cm spindle cell neoplasm centered in the left posterolateral base periprostatic soft tissue. C) The lesion is unencapsulated, but well-circumscribed without invasion into the immediately adjacent prostatic stroma. D) Higher magnification revealing a variably cellular spindle cell neoplasm, with alternating zones of hypo- and (E) hyper-cellularity. Associated variably sized hyalinized blood vessels are prominent. (F) The neoplastic cells are cytologically bland with ill-defined cytoplasmic borders, elongated and wavy nuclei, and variably tapered nuclear ends. G) Immunohistochemical stains demonstrating (H) strong and diffuse nuclear and cytoplasmic S100 expression, and (I) diffuse weak to moderate nuclear SOX-10 expression.

Table 1
Literature review of sporadic prostatic schwannomas.

Reference	Lesion-related Symptoms	Physical Exam	Schwannoma Location	Treatment	Outcome
Jiang R et al.[5]	Painful hematuria, obstructive voiding	Enlarged, tender prostate, PSA 1.8 ng/mL	Intraprostatic, left lobe, 7 cm	Transvesical suprapubic prostatectomy	NED 2-years at time of publication
Francica et al.[2]	Asymptomatic	No palpable prostate nodule, PSA 2.4 ng/mL	Intraprostatic, peripheral zone, 1.2 cm	Observation	Unchanged disease 1-year post-observation
Rane et al.[3]	Four years of obstructive symptoms	Benign enlargement of prostate, PSA n/a	Intraprostatic, size n/a	Exploratory laparotomy	NED at 17 months post-operatively
Üçer et al.[4]	Severe lower urinary tract symptoms	Grade 3 enlarged prostate. PSA 2.1 ng/mL	Intraprostatic, size n/a	Transvesical suprapubic prostatectomy	NED 18 months post-operatively

PSA = Prostate specific antigen; NED = No evidence of disease.

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