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Rare prostate cancer mimic on multiparametric MRI: Cowper's gland hyperplasia

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ABSTRACT

Multiparametric MRI and targeted biopsies of the prostate have been increasingly utilized in men with elevated PSA. It is important to recognize potential mimics of prostate cancer on MRI and on biopsy specimens. Familiarity with the location, imaging and histological appearance of Cowper's glands will prevent misdiagnosis and help avoid unnecessary biopsies. We present a case of Cowper's gland hyperplasia with a review of its imaging and histopathologic characteristics.

Introduction

Multiparametric magnetic resonance imaging (MRI) of the prostate has been increasingly adopted in the evaluation of men with elevated prostate specific antigen (PSA) to identify suspicious regions before targeted biopsies. With its increasing utilization, it is important for radiologists, urologists, and pathologists to recognize potential mimics of prostate cancer on MRI and biopsy specimen. A vital component of the male reproductive system, Cowper's glands are closely related to the prostate gland apex and, when enlarged, may mimic a prostatic nodule. Familiarity with the location, imaging and histological appearance of these glands will prevent misdiagnosis and help avoid unnecessary biopsies. We present a case of Cowper's gland hyperplasia with a review of its imaging and histologic characteristics.

Case report

A 57-year-old man with a previous negative systematic prostate biopsy and without other significant past medical history presented to the outpatient urology office for evaluation of elevated prostate specific antigen, most recently 11.3 ng/mL. A multiparametric prostate MRI was performed to evaluate for potential prostate lesions.

Although no suspicious intra-prostatic lesion was identified on the MRI, a 15 mm nodule abutting the distal most left apex was noted, centered at the level of the left urogenital diaphragm, the expected location of the left-sided Cowper's gland. The nodule demonstrated slightly heterogeneous intermediate signal intensity on T2-weighted images and homogenous, avid enhancement on post-contrast images, and no significant restricted diffusion (Fig. 1), features mimicking nodular prostatic hyperplasia. Given the unexplained PSA elevation and the close relationship between the nodule and the apex of the prostate, a targeted MRI-guided biopsy was performed which revealed hyperplastic Cowper's glands with no evidence of malignancy (Fig. 2).

Discussion

Cowper's glands – also known as bulbourethral glands – are a pair of pea-sized exocrine glands in the male reproductive system located just inferior to the prostate apex at the level of the urogenital diaphragm. These are homologous to the Bartholin's glands in women. Cowper's glands secrete an alkaline mucus fluid that aids in urethral lubrication, reduces the urethral acidity from residual urine and neutralizes the vaginal acidity.[1]

Due to its proximity to the prostate gland apex, they can be found in prostatic specimens, particularly during biopsies of apical lesions. On histopathology, they are characterized by compact glandular arrangement comprised of mucin-containing cells with small nuclei and inconspicuous nucleoli. Because they are closely packed glandular units, Cowper's glands can be misdiagnosed as prostatic adenocarcinoma.[2] To our knowledge, the MRI features of benign hyperplasia of the Cowper's gland has not been reported. In this case, its appearance resembled a nodule of benign prostatic hyperplasia.

Other benign congenital and acquired conditions have been reported affecting the Cowper's glands.[1] Syringoceles – which on MRI are seen as

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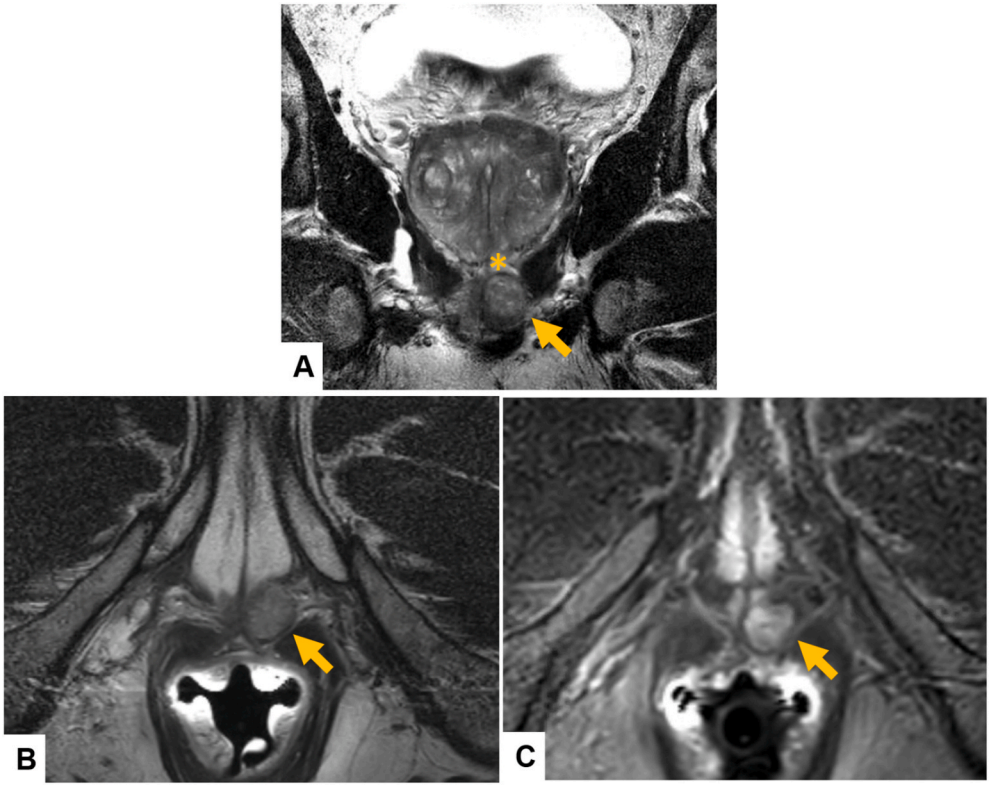

Fig. 1. Multiparametric MRI for evaluation of elevated PSA (11.3 ng/mL) in a 57-year-old man with previous negative systematic biopsy revealed a 15 mm circumscribed solid nodule (*arrows*) abutting the inferior most left apex of the prostate (*asterisk*) seen on coronal (**A**) and axial (**B**) T2-weighted images. The nodule was centered at the left aspect of the urogenital diaphragm and demonstrated avid post-contrast enhancement (**C**). Since it was unclear whether this represented a prostatic or periprostatic lesion, PI-RADS scoring was not used.

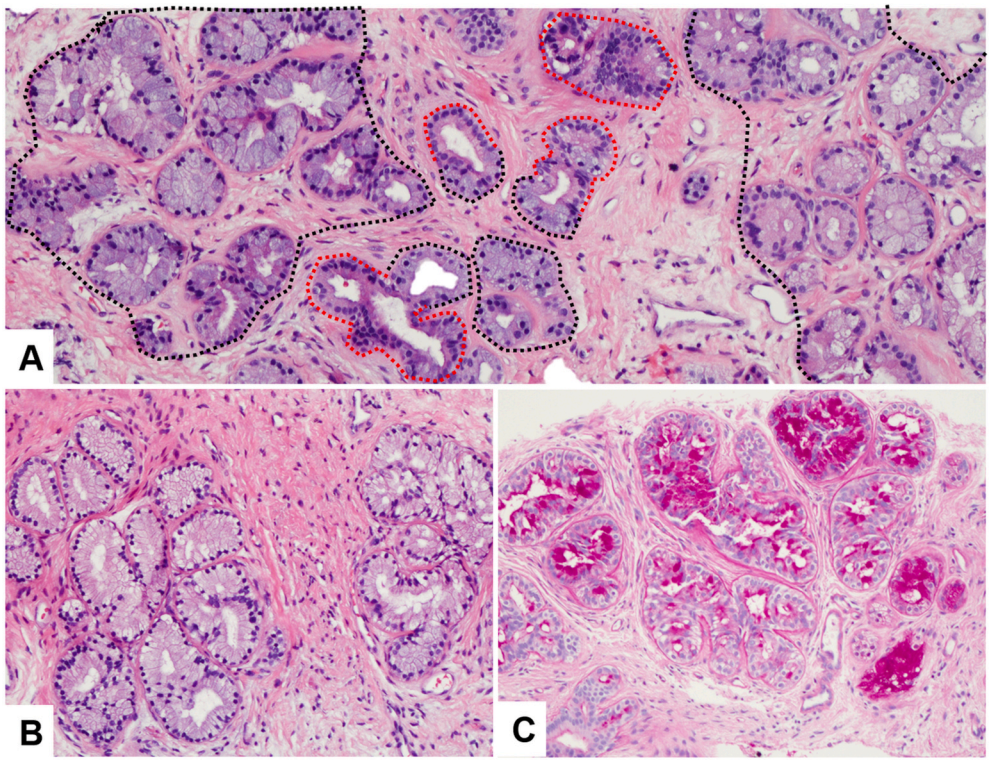

Fig. 2. Histopathology of targeted MRI-guided biopsy specimens demonstrating expansile growth of dimorphic population of acini and excretory ducts, arranged in a lobular configuration with interspersed fibrous tissue (**A** and **B**). The acinar cells (*black dotted lines* in **A**) are distended with mucin, supported by PAS and PAS-diastase special stain (**C**), with small and dense basal nuclei without conspicuous nucleoli (**B**). Amidst the mucinous acini are excretory ducts (*red dotted lines* in **A**) lined by low cuboidal cells with more eosinophilic cytoplasm. These findings are characteristic of Cowper's gland hyperplasia. It may mimic foamy gland prostatic adenocarcinoma, which exhibits similar morphology with abundant foamy cytoplasm and basally located small hyperchromatic nuclei. Histologic evidence of lobulation of two components (duct and acini) and ancillary work-up, including immunohistochemical and special stains (PSA and mucicarmine) aid to distinguish Cowper's glands from prostate cancer. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

a cystic lesion extending from the bulbourethral glands potentially impressing on the bulbous urethra –, are usually an incidental finding without clinical implications, rarely presenting with either irritative or obstructive symptoms.[3] A local inflammatory process referred to as Cowperitis has also been reported and is rare, occasionally progressing to sepsis.[4] Cowper's gland calcifications have been reported in elderly patients. Proposed etiologies for calcifications include ductal obstruction with stasis of secretions, infection with urea-splitting organisms, and sequelae of diabetes mellitus. These can rarely obstruct or become infected. Malignant conditions of the Cowper's gland are rare. The most

common yet extremely rare – fewer than 15 cases reported in the literature[5] – adenocarcinoma of the Cowper's gland is not associated with PSA elevation.

Conclusion

With the increasing utilization of multiparametric MRI and targeted biopsies, radiologists, urologists, and pathologists should recognize the location of the Cowper's glands on cross-sectional imaging to avoid unnecessary biopsies. It is also important to distinguish its histopathological features as this region can be inadvertently biopsied during sampling of the apex of the gland leading to potential misdiagnosis. Our case highlights the MRI and histopathologic appearance of Cowper's gland hyperplasia.

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Declaration of competing interest

None.

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