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Multiparametric MRI at 3 T of Usual Prostatic Carcinoma with Neuroendocrine Differentiation: First Case Report

LETTER TO THE EDITOR

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Neuroendocrine tumors (NETs) develop from cells of the neuroendocrine system. These neoplasms may be solitary or associated with tumors localized in distant organs, and their radiological diagnosis may be problematic (1).

Prostatic NETs include the following: 1) usual prostatic adenocarcinoma (PA) with neuroendocrine differentiation, 2) adenocarcinoma Paneth cell-like neuroendocrine differentiation, 3) carcinoid tumor, 4) small cell carcinoma, and 5) mixed neuroendocrine differentiation-acinar adenocarcinoma (2).

Immunohistochemical analysis is essential for prostatic NET diagnosis and is widely used in basic research to understand the pathogenesis of very rare diseases in humans (3, 4).

We report the first presentation of usual PA with neuroendocrine differentiation, with an emphasis on the radiological pattern.

A 64-year-old man presented with acute perineal pain and recent episode of hematuria. Rectal exploration showed intense pain in the prostatic region. The level of serum PSA a month before was 3.8 ng/mL.

Multiparametric MRI (mpMRI), incorporating morphologic T2-weighted imaging (T2WI), diffusion-weighted imaging (DWI), and dynamic contrast-enhanced (DCE) imaging of the prostate with high field strength (3 T) without an endorectal coil, showed a prostatic mass invading the lower left portion of the bladder, the anterior rectal wall, and both obturator muscles (Figure 1). MpMRI revealed the presence of bone and lymph node metastases.

The mass originated from the prostatic peripheral zone and encompassed the central portion of the prostate gland without an apparent infiltrating sign.

Three cores of the right lobe and five cores of the light lobe of the prostate gland showed usual PA with neuroendocrine differentiation (positivity of CD 56, synaptophysin, and NSE), with a high proliferative index (90%). Usual PA with neuroendocrine differentiation is an extremely rare neoplasm (4% of all prostate cancers).

The neoplasm is characterized by high aggressiveness and poor prognosis.

Generally, the level of serum PSA did not increased. Consequently, making an early diagnosis is very difficult. The symptoms are often caused by the invasion of the pelvic and perineal structures when the neoplasm is diffused.

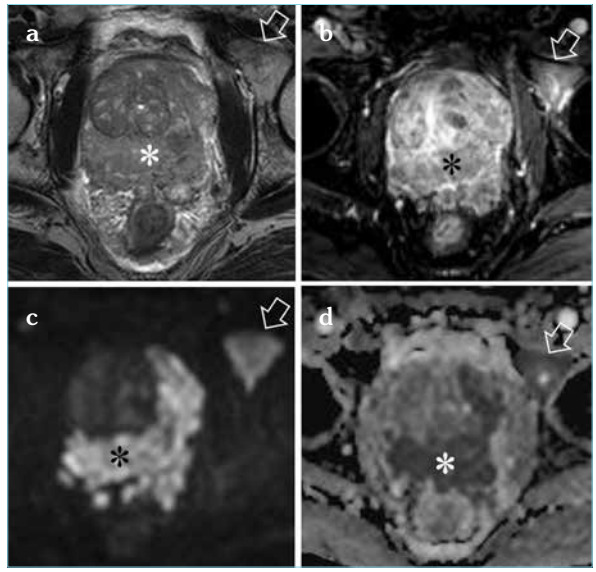

Figure 1. a-d. Multiparametric MRI showed an extensive lesion (*) affecting the peripheral zone of the prostate from the base to the apex, and infiltrating the adjacent anatomic structures. Three cores of the right lobe and five cores of light lobe of the prostate gland showed usual prostatic adenocarcinoma with neuroendocrine differentiation. The lesion appears hypointense on T2-weighted imaging (a), has inhomogeneous enhancement on DCE sequences (b), appears hyperintense on DW MRI (b value=2000 s/mm²) (b) and hypointense on the ADC map (c), indicating restricted diffusion. DW MRI (c, d) and T2-weighted MRI (a) were sufficient to indicate biopsy and further work-up. Note the metastasis in the left ischiatic branch (arrow)

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mpMRI has now become the mainstream *choice* for PA *detection and localization (5, 6)*. In the reported case, mpMRI showed an extensive PA with neuroendocrine differentiation, with similar signal intensity to that of PA on morphologic T2WI, DWI, and DCE imaging; the lesion involved the peripheral zone of the prostate and infiltrated adjacent anatomical structures. In the reported case, DCE imaging did not add useful information in the detection, localization, and locoregional staging of the tumor. T2WI and DWI (biparametric MRI) resulted accurate for these purposes and for the adequate management of patients (7-9).

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