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CASE REPORT

A case with primary signet ring cell adenocarcinoma of the prostate and review of the literature

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Summary ***Primary signet cell carcinoma of the prostate is a rare histological variant of prostate malignancies. It is commonly originated from the stomach, colon, pancreas, and less commonly in the bladder. Prognosis of the classical type is worse than the adenocarcinoma of the prostate. Primary signet cell adenocarcinoma is diagnosed by eliminating the adenocarcinomas of other organs such as gastrointestinal tract organs. In this case report, we present a case with primary signet cell adenocarcinoma of the prostate who received docetaxel chemotherapy because of short prostate specific antigen doubling time.***

KEY WORDS: *Signet cell; Adenocarcinoma; Prostate adenocarcinoma.*

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INTRODUCTION

Primary signet cell carcinoma of the prostate is a rare histological variant of the prostate malignancies. It is a subtype of the prostate adenocarcinomas, which releases mucin. It is called signet cell because the mucin released pushes the nucleus to the periphery and makes the cell looks like a signet cell. However, there are also some other types that do not release mucin (1). Generally, it is originated from the stomach, colon and pancreas and less commonly from the bladder. It constitutes approximately 3-4% of the all stomach cancers (2). It is rare in the prostate and at a later stage when diagnosed (1). Classical type has a worse prognosis when compared to prostatic adenocarcinoma (5). In this manuscript, we present a case with primary signet cell adenocarcinoma of the prostate that was diagnosed at a later stage, gave a poor response to the anti-hormonal treatment and had a short *prostate specific antigen* (PSA) doubling time, therefore received chemotherapy. Additionally, we reviewed the current literature in relation with our case.

CASE REPORT

A 66-year-old man presented to an outpatient service complaining of difficulty in urination. At rectal examination, his prostate was found to be hard in texture. Apart from *chronic obstructive pulmonary disease* (COPD) and diabetes mellitus (DM) he had no prior disease history. A transrectal ultrasound-guided 10-quadrant fine needle biopsy of the prostate was performed as his PSA level was above 100 ng/dl. We detected the classical type of the prostate adenocarcinoma with Gleason score of 4 + 5 in all of the 10 quadrants and planned a whole body bone scintigraphy to grade the carcinoma. There were multiple bone metastases. Abdominal computerized tomography showed bilateral hydronephrosis, enlarged para-aortic and para-iliac lymph nodes. Therewith, the patient with a urinary catheter was referred to our center, which is a tertiary clinic. His PSA level was above 6658 ng/dl and his bone scintigraphy indicated a very dense metastasis in the vertebra. Thus, we planned leuprolide acetate monotherapy and palliative radiotherapy to prevent bone fractures. We performed transurethral prostate resection as he had the catheter and detected poorly differentiated signet cell adenocarcinoma with a Gleason score of 5 + 5. Because of the diagnosis of the signet cell adenocarcinoma, we explored for a primary adenocarcinoma locus but we did not detect any other malignity. Following a 3-month hormonotherapy, his PSA level was 441 ng/dl. However, it increased again and we planned antiandrogen treatment. Following leuprolide acetate and antiandrogen treatment, at the end of the ninth month, his PSA level was 84.4 ng/dl and testosterone level was < 20 ng/ml. Subsequently, his PSA level increased again and three months later was 271 ng/dl. We considered the case as castration resistant and we graded it again. Docetaxel on day one of a 3-week cycle with a dose of 75 mg/m^2 was administered with a 3-week cycle. After the 12th cycle, his symptoms decreased, although his PSA level remained between 200 and 281 ng/dl. He developed urosepsis during the chemotherapy and received antibiotic therapy. However, he died of urosepsis after 22 months.

DISCUSSION

Primary signet cell adenocarcinoma of the prostate was described first in 1979. Since then, there are only 69 cases reported and mean duration of survival in those reported cases was 28 months (3, 4). Mean age of these

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cases was 68.2 years (1). The tumor can present with voiding problems as in the classical presentation of the prostate cancer. However, it can present with symptoms related to metastasis. Our case presented with urination problems. In total, 42% of the cases in the literature are at stage T4 and this indicates the aggressive nature of the signet cell adenocarcinoma of the prostate (1, 2).

The name signet cell was given because of the appearance of the cell as large vacuoles push the cell nucleus to the periphery (1). It is generally originated from colon, pancreas and breast. Prostate as a primary location of signet cell adenocarcinoma is rare. Some similar conditions should be considered and eliminated before diagnosing a primary signet cell adenocarcinoma. Such conditions include prostate lymphoma in which the prostate is infiltrated by lymphocytes and has aspects of the muscle cells as after radiotherapy and antihormonal therapy (1, 2). We diagnosed our case after leuprolide acetate treatment. Thus, we considered that the condition might be related to antihormonal therapy. However, we eliminated this diagnosis using immunohistochemical staining. Negative results of *leucocyte common antigen* (LCA), *alpha-smooth muscle actin* (ASMA), cytokeratin-7 and 20 and positive PSA results favor the diagnosis (3-6). *Carcinoembryonic antigen* (CEA) was positive in 20% of the cases in the literature (10) whereas PSA and *prostate specific acid phosphatase* (PSAP) were positive in 87% of the cases (10). Additionally, in the literature, positive staining with *periodic acid-schiff* stain (PAS) was positive in 60%, with alcian blue 60% and with mucicarmin 50% (11). Some Authors suggested that signet cells should be present in more than 20% of the tumor tissue (10, 11). In the current case, PSA, PAS, PSAP, alcain blue were positive. On the other hand, LCA, ASMA, CEA and cytokeratin 7 and 20 were negative. Diagnosing the primary signet cell adenocarcinoma of the prostate is difficult because it is problematic to exclude the possibility of the metastases of other organs to the prostate. Presence of a tumor in the gastrointestinal tract should be explored with radiologic and endoscopic methods (3). In our case, we screened the gastrointestinal tract with colorectal and gastro esophageal endoscopy and did not find any locus.

Primary signet cell adenocarcinoma of the prostate is more aggressive with less treatment response and poor prognosis when compared to the classical type of the prostate adenocarcinoma. Three-year survival is 55% and 5-year survival is 12%. In previous publications poor response to antihormonal therapy was reported (7, 9). In our case, treatment response to antihormonal therapy was good for a short period of time, but later tumor became castration resistant. *Roldan et al.*, had almost full response with oxaliplatin, 5-FU, and leucovorin (*Folfox*) combination which are used for colorectal cancer (8). Studies indicate that prognosis is related to the grade of the tumor when diagnosed (8).

Conclusions

Primary signet cell carcinoma of the prostate is a rare histological variant of prostate adenocarcinomas.

Gastrointestinal tract should be screened for other tumor loci and this possibility should be eliminated for diagnosing cases with primary signet cell adenocarcinoma of the prostate. In contrast to the other signet cell carcinomas, treatment of the primary signet cell adenocarcinoma of the prostate is the same with the classical adenocarcinoma. Prognosis of this carcinoma is bad as it is a rare and aggressive tumor and diagnosis is generally made at an advanced stage of the disease.

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