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Glomerulonephritis as a paraneoplastic event from prostate cancer relapse

Case Report

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Abstract: Objective: We wish to investigate whether there is a known connection between prostate cancer and glomerulonephritis. Methods: We present a case report of a patient whom we diagnosed with rapidly progressive glomerulonephritis as a result of prostate cancer relapse. Results: In rare cases, prostate cancer is associated with crescentic glomerulonephritis. Conclusion: Every patient with cryptic glomerulonephritis should be screened for cancer.

Keywords: *prostate cancer • glomerulonephritis • paraneoplastic*

1. Introduction

We report a case of glomerulonephritis, which manifested as the leading event of prostate cancer relapse. Glomerulonephritis of paraneoplastic origin is not a common condition, and because there are no specific pathognomonic features, it is difficult to diagnose. Prostate cancer has been associated with paraneoplastic events involving the kidney, but treatment options are limited to individual trials.

2. Patients and Methods

2.1. Case report

A 72-year-old male patient came to the emergency department because of fatigue. The physical examination was unrevealing apart from mildly increased temperature. His laboratory evaluation revealed acute kidney damage and he was hospitalized for treatment. He did not report any vomiting or diarrhea and denied taking any nephrotoxic agent. His past medical history showed that he had total prostatectomy 20 years ago, which he followed up with his urologist for some years, but he did not have any additional prostatic-specific antigen (PSA) measurement or imaging for at least 10 years. He also suffered from cervical degenerative disc disease, for which he was treated with dexamethasone in the last year. He had hepatitis C in the past, arterial hypertension, dyslipidemia, and a history of low platelet count, which was of no clinical significance and was attended by a hematologist without the need for treatment.

A kidney, ureter, bladder ultrasound and a renal vascular Doppler ultrasound were unrevealing. He was treated with intravenous fluids and his renal function improved mildly. Then he was discharged home with a recommendation to repeat blood tests the following days. In the new tests, a worsening kidney failure was observed, without any significant symptom, and he was called to be hospitalized once again for additional testing. Computed tomography (CT) scans of the chest and abdomen were normal, but because an increased PSA was found, a prostate-specific membrane antigen positron emission tomography/computed tomography (18F-PSMA PET/CT) scan was ordered, which revealed local relapse of prostate cancer. A renal biopsy revealed diffuse glomerulonephritis with crescent formation. A fat tissue biopsy was negative for amyloidosis and on immunology testing, c-antineutrophil cytoplasmic antibodies (c-ANCA), p-antineutrophil cytoplasmic antibodies (p-ANCA), and anti-cyclic citrullinated peptide (anti-CCP) antibodies were positive, while the same tests were negative 2 months before. The patient was treated with methylprednisolone, and he is now on treatment with rituximab in the outpatient department. Oncology and urology consultation agreed upon androgen deprivation therapy for the prostate cancer relapse.

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3. Discussion

This is a complex medical case of acute kidney failure because of crescentic glomerulonephritis. Such cases of glomerulonephritis can be caused by infection, immunologic reactions, paraneoplastic conditions, and others. In the patient discussed above, there is a suspicion of an underlying rheumatic disorder due to the history of arthritis. Rheumatoid arthritis is not commonly associated with glomerulonephritis. It is pointed out that the case of secondary kidney amyloidosis was ruled out. The relapse of prostate cancer 20 years after its total surgical removal is another peculiar finding. The concomitant finding of glomerulonephritis along with prostate cancer relapse raises the suspicion of paraneoplastic origin.

Paraneoplastic syndromes comprise clinical phenomena resulting from various complex and often unexplained biochemical disturbances, associated with and caused by cancer. It is a phenomenon evident in up to 8% of cancer patients[1]. Furthermore, paraneoplastic glomerulonephritis is a rare occurrence, which is difficult to diagnose. A neoplastic origin of a glomerulonephritis can only be assumed since there are no pathognomonic features in renal biopsy to indicate a paraneoplastic event. Usually, the association is hypothesized to be due to a chronological relation between the two diagnoses and in the absence of a different explanation for the cause of the renal disease.

Paraneoplastic glomerulonephritis cases are associated more frequently with solid tumors of the lung and the gastrointestinal tract, and most of the time, they are evident as membranous nephropathy. Bacchetta et al.'s[2] review also reports associations of carcinomas with minimal change disease, IgA-nephropathy, mesangiocapillary glomerulonephritis, secondary amyloidosis, focal and segmental glomerulonephritis, thrombotic microangiopathies, and focal and segmental glomerulosclerosis. Crescent formation glomerulonephritis is associated more frequently with renal cell carcinoma, whereas there are three cases in which it is associated with prostatic carcinoma.

It is reported that in more than 70% of prostate cancer cases, paraneoplastic events can be the initial clinical symptom, while in cases of cancer relapse, it can also be the indicative event[3]. The most frequent paraneoplastic events associated with prostate cancer are endocrine, neurologic, dermatologic, inflammatory, and other conditions, while glomerular disease is most often a result of microangiopathy, such as thrombotic thrombocytopenia, and most of the time, it develops as membranous nephropathy. Immune reactions involving cancer antigens, such as PSA, are suspected to be involved in the underlying pathogenic mechanism that leads to the manifestation of glomerulonephritis[2].

Treatment options in such cases are quite challenging. The mainstay of therapy is to treat the underlying cancer, which would, in theory, suppress the immune reaction and reverse the renal damage. On the other hand, immunosuppressive therapy could offer a synergistic effect, resulting in the remission of glomerulonephritis; it could, though, exacerbate the malignancy. In the case of our patient, immunosuppressive therapy was used in addition to hormonal therapy for the prostate cancer.

4. Conclusion

Glomerulonephritis associated with cancer is not a common condition, but it should always be included in the differential diagnosis of such cases. In cases of glomerulonephritis, especially where no obvious underlying pathology is found, there should be a high index of suspicion for neoplastic disorders or even cancer relapse. Thus, proper screening for early cancer detection should be done in such patients.

Abbreviations

PSA: prostatic-specific antigen, PSMA PET/CT: prostate-specific membrane antigen positron emission tomography/computed tomography, ANCA: antineutrophil cytoplasmic antibodies, CCP: cyclic citrullinated peptide

Statement of Ethics

Informed consent was obtained from the patient.

Conflict of Interest Statement

There are no conflicts of Interest to be reported.

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Author Contributions

All of the above authors were part of the team of the attending physicians that diagnosed and treated the above patient.

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