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Case Study
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Case Study - Adenocarcinoma Prostate

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History

A 64 years old farmer complained of Urinary Frequency, Few episodes of hematuria, Hesitancy with weak stream, Urinary urgency along with low grade continuous backache off &on constipation. DRE revealed Enlarged prostate gland with many palpable nodules. Rest of the History is Unremarkable.

Investigations

The patient had a prostate-specific antigen (PSA) level of 105 ng/mL (range: 0.0 ng/mL to 4.0 ng/mL), while a similar determination 6 years earlier showed a PSA of 2.5 ng/mL. His hemoglobin was 14 g/dL (range: 13.2 g/dL to 17.1 g/dL), Hematocrit 44% (range: 38.5% to 50%), White blood cell 7,600/mm^3, Normal differential, Platelets 250,000/mm^3, Blood urea nitrogen 15 mg/dL (normal range: 7 mg/dL to 30 mg/dL), and Creatinine level 1.0 mg/dL (range: 0.5 mg/dL to 1.4 mg/dL). Alkaline phosphates and Liver function tests were all within normal range.

Imaging Studies

A transrectal ultrasonography-guided biopsy was performed. It revealed many hypoechoic or echopenic areas within the homogeneous parenchyma of the gland [1]. MRI of the spine revealed a metastatic lesion at the level of T9, showing infiltration of the entire vertebral body marrow space, suggestive of metastasis [2]. No evidence of cord compression; however, there was signal activity in proximity to the corresponding nerve root [3]. Radionuclide scintigraphy demonstrated several areas of increased radionuclide uptake along the spine suggestive of metastatic bone disease, which were consistent with evidence derived from MRI studies [4]. Chest, abdominal, and pelvic CT scans demonstrated no evidence of nodal or visceral metastasis; however, the prostate was enlarged and irregular with extensive deformity of the bladder neck [5].

Staging

In the Tumor, Nodes, Metastases staging system, the tumor had extended bilaterally through the prostatic capsule (T3b), and metastasis was found in bone (M1b). The patient was staged as stage D2 with Extensive Local Disease [6].

Biopsy Results

Histologic evaluation of the biopsy specimens revealed a *Gleason score of 8 (4 + 4)* and *adenocarcinoma in 7 of 12 multiple cores,* representing 60% of the biopsied material [7].

Diagnosis

Based upon prostate biopsy evaluation and ultrasound images, radionuclide scintigraphy, and MRI studies, a diagnosis was made of Advanced Prostatic *Adenocarcinoma* With Metastases to the Bone [7].

Treatment Options

In view of the advanced stage of the disease and evidence of distant metastasis, the primary treatment modality for this patient was systemic therapy in addition to the standard systemic approach, local palliative measures should be considered [4,5]. He was, therefore, treated with a Gonadotropin-Releasing Hormone (GnRH) antagonist.

External Beam Radiation Therapy

The role of radiation therapy in the setting of this patient's disease was primarily palliative and focused on the control of local obstructive problems. After a 3-month treatment with abarelix, the patient experienced a significant improvement of his urological symptoms.

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To further improve local control and relief of obstruction, a course of palliative external beam radiation was administered. A total of 40 treatments over an 8-week period consisted of 3-dimensional conformal radiation therapy, which delivered a total 6570 Gy dose of radiation to the prostate.

Treatment of Bone Metastases

Abarelix produced a rapid decline of the serum PSA to <0.1 ng/mL after 3 months of treatment. This was associated with major improvements in pain [4]. External beam radiation to the involved vertebral body was subsequently delivered to enhance local control and to minimize the possibility of future neurological complications resulting from spinal cord or nerve root compression [6]. To further improve the management of bone metastasis, the patient was initiated on bisphosphonate treatments with intravenous infusions of zoledronic acid.

Follow-Up

Follow-up at 6 months showed a healthy-looking patient with PSA level <0.1 ng/mL. Long-term gonadal suppression with abarelix was planned and the patient was continued with serial physical exams, routine blood evaluations, including serum PSA determinations at regular intervals (every 3 months), and radiological assessments every 6 to 12 months or as clinically indicated.

Discussion

The use of androgen ablation in the treatment of advanced cancer of the prostate has been standard treatment for many years. The role for local radiation therapy in patients with distant metastasis is primarily palliative [3]. In this case, it was elected to proceed with external beam radiation to metastatic sites primarily to increase local control of severely involved sites associated with major symptoms and impending serious life- and functionally threatening complications. Specifically, there was evidence of significant anatomic bladder-outlet obstruction and potentially impending neurological compromise due to local extension of disease to the radicular space. Furthermore, the patient demonstrated significant symptoms associated with these involved metastatic sites. Androgen ablative therapy with abarelix was shown to be highly effective in reducing the PSA to <0.1 ng/mL in a short period of time [8]. The use of a GnRH antagonist (abarelix) in this setting was critical in view of the severity of symptoms and need for rapid therapeutic effects. In addition, the flare phenomenon (reported in 10% to 30% of patients treated with luteinizing hormone-releasing hormone agonists) is avoided with abarelix, which is a major factor in the selection of GnRH antagonists as the initial treatment approach [9].

The prognosis for this patient is poor due to the extensive degree of metastatic bone involvement Data derived from large prospective randomized trials indicate that the median time to progression with conventional forms of androgen ablation approaches ranges between 12 months to 18 months and the median survival is around 30 months to 36 months [10]. The main issue centers on the development of hormone resistance. Evolving data with new chemotherapeutic approaches suggest that non hormonal treatment plays a significant role in the treatment of patients with hormone-resistant prostate cancer [11] and may be a major addition to hormonal treatment in the initial management of patients with metastatic disease [12].

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