

Malignant spinal cord compression secondary to testicular seminoma at the time of initial presentation and at relapse while on surveillance

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Abstract

We report cases of 2 pure seminoma patients who developed metastatic spinal cord compressions. One patient was diagnosed at age 33 years with stage 1 seminoma and, after undergoing an orchidectomy, chose to be followed on a surveillance protocol. He was lost to follow-up and presented again 22 months later with back pain, leg weakness and sensory loss when his disease recurred as a spinal cord compression. He was treated with urgent surgical decompression and subsequent standard chemotherapy. More than 2 years posttreatment, he is disease-free with normal neurologic function in his lower extremities. The second patient presented at age 44 years with back pain and rapid loss of leg strength and sensation. Investigations revealed a malignant cord compression with lymphatic and vertebral body metastases. On physical examination, the patient was found to have a 6-cm left testicular mass. He was treated with emergency radiotherapy to the region of his cord compression followed by a left inguinal orchidectomy. Pathology confirmed a pure classic seminoma. Postoperatively, he received standard chemotherapy and eventually regained neurologic function in his legs. Although it is rare for malignant spinal cord compression to occur in seminoma patients—either as the initial presentation of disease or as a site of disease recurrence in stage 1 patients on surveillance—it is crucial to consider seminoma as a possible etiology in young men diagnosed with malignant spinal cord compression because timely contemporary treatments for seminoma will cure most of these patients and offer them excellent functional recovery.

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Testicular cancers are the most common solid malignancies in young men. More than 50% of testicular cancers are seminomas, which appear to be on the rise relative to nonseminomas.¹ The most common initial presenting symptom of testicular seminoma is a painless testicular mass. For stage 1 patients on surveillance, the most common sites of recurrence are lymphatic (most commonly para-aortic) and viscera (most commonly lung).²⁻⁴ Spinal cord compression (SCC) is a very rare manifestation of pure seminoma, either at the time of the diagnosis or relapse. We present 2 cases of seminoma with malignant SCC at the time of initial diagnosis and relapse.

Case Reports

Patient 1

In 2002, a 33-year-old man with no prior medical problems underwent a scrotal ultrasound to investigate painless swelling in his right testicle. The scan confirmed the presence of a solid right testicular mass and in August 2002, the patient underwent a right inguinal orchidectomy. Pathology revealed a 4.5-cm classic seminoma. There was evidence of focal invasion into the tunica, but not through it. His preoperative human chorionic gonadotropin (HCG) level was 6 U/L (normal < 5). Staging CT scan of the thorax and abdomen was normal, confirming the presence of stage 1 disease. After discussing his postoperative management options with a radiation oncologist in October 2002, the patient elected to be followed on a surveillance protocol. He was seen for follow-up in February 2003 at which time his HCG level and his follow-up CT scan of the thorax, abdomen and pelvis were normal. The patient did not keep any of his subsequent follow-up appointments with his oncologist. Starting in January 2004, he experienced gradually worsening back pain. Over the course of a few days in May 2004, he developed weakness and loss of sensation in both lower extremities to the point where he was immobilized. He was assessed and admitted to a local hospital on an urgent basis. Magnetic resonance imaging (MRI) scan of the spine demonstrated the presence of retroperitoneal lymphadenopathy along with metastatic deposits in the thoracic and lumbar vertebral bodies.



Fig. 1. Sagittal T2-weighted magnetic resonance image of patient 1's spine demonstrating complete collapse of the T12 vertebral body with a pathologic burst fracture and retro-pulsion into the spinal canal causing a spinal cord compression. There is abnormal retroperitoneal lymphadenopathy anterior to the lumbar vertebrae.

A pathologic burst fracture at T12 was associated with a large paravertebral and epidural soft tissue component causing an SCC at that level (Fig. 1 and Fig. 2). At the time of this presentation, the patient's HCG was 3326 U/L. He underwent urgent decompression surgery, which involved posterior instrumentation and fusion of T10 to L2 vertebral bodies. Samples of the spinal tumour confirmed the presence of metastatic seminoma. A postoperative bone scan revealed the presence of additional metastatic disease in the right scapula, pelvis and ribs. Postoperatively, the patient remained confined to a wheelchair. Combination cisplatin, etoposide and bleomycin chemotherapy was initiated and he received his fourth and final cycle in September

2004. By November 2004, the patient's HCG level was normal again and he was ambulating with no assistance. An ^{18}F Fluoro-2-deoxyglucose positron emission tomography scan performed in November 2004 did not reveal any evidence of metabolically active tumour. The patient completed intensive physical rehabilitation and continues to be followed by his medical oncologist. At his last follow-up visit in October 2006, he was completely asymptomatic and had normal strength and sensation in his lower extremities. His most recent follow-up CT scan and tumour markers did not indicate any evidence of recurrent disease.

Patient 2

In July 2006, a previously healthy 44-year-old man began to have back pain that was believed benign in nature. Over the following 2 months, his pain worsened and in October 2006, over a 3-day period, he experienced a dramatic loss of power and sensation in his lower extremities. He was assessed at his local hospital and transferred to a university-affiliated tertiary care hospital for an urgent MRI scan of his spine. The MRI demonstrated the presence of a malignant SCC at the T4 and T5 levels, secondary to an extradural soft tissue mass to the left of midline (Fig. 3). Abnormal marrow signals consistent with metastatic disease were noted in the T1, T2, T3, T4 and T5 vertebral bodies. Large paravertebral soft tissue masses were visualized in the thoracic and lumbar regions. The patient was started on steroids and underwent a CT-guided biopsy of the thoracic paravertebral mass. The preliminary report of the pathology from this biopsy indicated the presence of an "undifferentiated carcinoma." He was assessed by the neurosurgical team, who did not believe that the patient was an appropriate candidate for surgical intervention. Initially, it was felt that the patient most likely had widespread lymphoma and he was referred to radiation oncology for emergency radiotherapy. The initial com-

plete physical examination by radiation oncology found a 6-cm stony, hard, left testicular mass along with sensory loss in the T4/T5 dermatome and lower extremity weakness such that the patient was barely able to lift his lower extremities against gravity. After the radiation oncology assessment it was felt that all clinical findings and information were consistent with a diagnosis of metastatic testicular cancer. The patient was admitted to the radiation oncology service and completed a course of emergency external beam radiotherapy, which began the evening of admission, directed to the region of the SCC. Two thousand centigray was prescribed in 5 daily fractions. The patient was maintained on corticosteroids during his radiation treatments. His HCG level was 54 U/L and α feto-protein was normal. Medical oncology and urology were consulted and on the fifth and final day of radiotherapy, the patient underwent a left inguinal orchidectomy. The pathology from the resected left testicle confirmed the presence of a 5.5 cm classic seminoma (Fig. 4 and Fig. 5). Final pathology from the patient's initial CT-guided paraspinous mass biopsy confirmed the presence of a malignant germ cell tumour. By the time the patient had completed his radiotherapy treatments, his lower extremity power and sensation had improved and he was ambulating with a walker. Combination cisplatin, etoposide and bleomycin chemotherapy was initiated at the completion of his radiation treatments. He continues on chemotherapy and is making steady neurologic improvement.

Discussion

Testicular seminoma is characteristically quite a chemo- and radiosensitive malignancy associated with very high cure rates. Approximately 80% of seminoma patients will have stage 1 disease (confined to the testicle) at the time of diagnosis and after an inguinal orchidectomy, management options of adjuvant radiotherapy to the



Fig. 2. Plain x-ray of patient 1's lumbar spine demonstrating a pathologic wedge compression fracture of the T12 vertebral body.

para-aortic lymph nodes or follow-up on a surveillance protocol are associated with cure rates in excess of 99%.¹ Now, there is also evidence for the role of single agent carboplatin as adjuvant therapy in high risk stage 1 seminoma.⁵ It is critical for all stage 1 patients who choose to be followed on a surveillance protocol to attend all scheduled follow-up appointments and scans to ensure that potential recurrences are detected and treated early.

Spinal cord compression is a devastating manifestation of metastatic cancer. The majority of malignant SCC in adults is secondary to cancers of the prostate, lung and breast, and it is estimated that between 5%



Fig. 3. Sagittal T2-weighted magnetic resonance imaging scan of patient 2's spine demonstrating a malignant spinal cord compression at the T4/T5 vertebral level, secondary to a extradural soft tissue mass. There is abnormal signal in the T1, T3, T4 and T5 vertebral bodies, and there is metastatic lymphadenopathy ventral to the lower thoracic and lumbar spine.

and 14% of all adult cancer patients will develop a metastatic SCC.⁶ Expedient diagnosis and treatment are essential to minimize the neurologic sequelae and preserve patients' quality of life.^{6,7} Available treatments for malignant SCC include systemic corticosteroids, radiotherapy or surgery. Results from a recent randomized trial indicate that surgical decompression followed by radiotherapy confer improved functional outcomes in patients with malignant SCC, compared with radiotherapy alone.⁸ Despite this trial, there remains no widespread consensus regarding the optimal treatment for malignant SCC. Many surgeons would consider bony compression causing an SCC, spinal instability, recompression in an irradiated region and neurologic deterioration during a course of radiotherapy as indications for surgical intervention.⁹ In the clinical setting of malignant SCC of unknown primary, surgery would also provide histologic confirmation of the primary tumour in addition to being therapeutic. Although there is no consensus on the optimal management of malignant SCC, a potentially aggressive intervention associated with long hospitalization and recovery in what is usually a palliative situation associated with limited survival¹⁰ must be weighed against individual patients' clinical status and prognosis.



Fig. 4. Cut-through of patient 2's resected left testicle showing tunica vaginalis and vasculature on the right, normal-looking tan testis tissue at the lower right and pale tumour in the central testis.

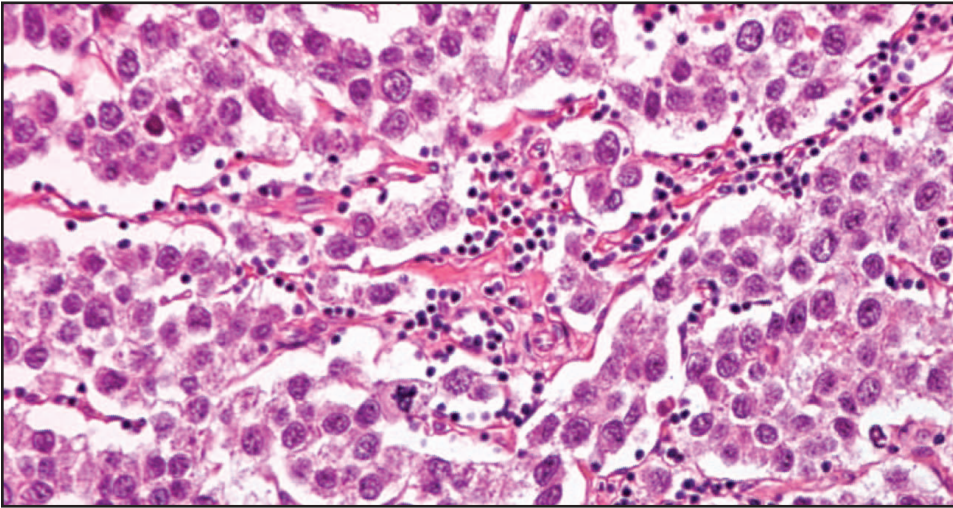


Fig. 5. High-power microscopy of patient 2's resected classic seminoma showing trabecular and nested proliferation of cells with clear to granular cytoplasm and large nuclei with big nucleoli and a high mitotic rate.

For seminoma patients who relapse, systemic cisplatin-based chemotherapy regimens and/or radiotherapy to the site(s) of relapse are associated with cure rates in excess of 80%–90%. It is relatively uncommon for seminoma patients to have distant metastatic disease at the time of diagnosis and extremely rare for the initial presentation of their illness to be a malignant SCC. In young men who develop rapid loss of sensation and/or strength or both and who are found to have malignant disease, it is crucial to include malignant seminoma in one's differential diagnosis, as even with metastatic disease, aggressive treatments given in a timely fashion are indicated and are associated with excellent outcomes and cure rates in excess of 90%.¹ These cases further highlight the need for physicians to perform a thorough physical examination, including a genital exam, in young men presenting with metastatic malignancy.

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