Spinal Cord Injury Caused by Epidural B-Cell Lymphoma: Report of Two Cases

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Abstract

Background/Objective: Spinal cord injury (SCI) caused by cancer is increasing in incidence as the mean age of our patient population increases. Understanding the prognosis and functional outcome requires knowledge of diseases of the spinal column. This paper presents the unusual presentation of epidural B-cell lymphoma.

Methods: Case reports.

Results: Two patients presented with an unusual cause of SCI, namely B-cell lymphoma. Both patients presented with sensory deficits greater than motor deficits and gait disorder. Both achieved functional independence at the community ambulation level and tumor remission with chemotherapy and radiation therapy.

Conclusions: B-cell epidural tumors are an uncommon cause of SCI. Functional outcome can be quite good, as can tumor outcome. Residual sensory deficits greater than motor deficits are not uncommon.

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Key Words: B-cell lymphoma; Spinal cord injuries, nontraumatic; Paraplegia; Epidural tumor

INTRODUCTION

With safety initiatives to prevent catastrophic neurologic injuries and with our aging society, the absolute and relative incidence of nontraumatic spinal cord injury (SCI) is on the rise. In the older population, unique causes of SCI directly related to age are seen, such as cervical stenosis from degenerative and rheumatologic causes, ischemia caused by abdominal aortic aneurysms, and cancer. Tumor-related SCI represents 25% of nontraumatic SCIs and 8% of all SCI cases (1). In all cancer cases, understanding the tumor type for correct identification allows for treatment planning and prognosis setting. This is critical in understanding the role of rehabilitation and setting reasonable functional goals for the individual patient. Neurologic status, overall health, extent of disease (spinal and extraspinal), and primary pathology influence proper treatment selection (2). A 1-year survival after rehabilitation for patients with metastatic spine

disease of 52% is associated with American Spinal Injury Association (ASIA) D status, tumor in remission, and increased independence in transfers and dressing (3). Other studies show that Functional Independence Measure (FIM) scores predict length of survival and that FIM scores improved significantly during inpatient rehabilitation (4). Ambulatory outcome was dependent on the tumor type and the ambulatory status before treatment. Impaired ambulation negatively affected survival (5). This paper presents 2 cases of B-cell lymphoma resulting in spinal cord compromise and incomplete paraplegia.

CASE 1

A 60-year-old man presented with a history of coronary artery disease, myocardial infarction, coronary artery bypass graft, fibromyalgia, and hypertension. Two years before, he presented with back pain and neurogenic claudication with magnetic resonance imaging (MRI) evidence of lumbar stenosis at L4–L5 and L5–S1, for which he underwent decompression spine surgery. One year later, he presented with upper back pain radiating into his shoulders. Two months later, a midthoracic spine fracture was seen on bone scan only; MRI and plain x-ray were negative at an outside facility.

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Within the following 3 months, he developed new low back pain with gradual difficulty walking. He presented to the emergency room with bladder incontinence and inability to ambulate. The bladder dysfunction had started 4 days before hospital presentation. His postvoid residual in the emergency department was 1,700 mL. He was admitted to the hospital. MRI showed a large soft tissue mass with compression of the distal spinal cord from T6 to T11 with involvement of multiple vertebral bodies (Figures 1 and 2). Tumor extension was noted laterally and anteriorly to the posterior abdominal wall. The surgical decision was to proceed with debulking and decompression at the level of spinal cord impingement at T10–T11 to allow definitive diagnosis for further treatment planning. A T10 and T11 laminectomy and epidural tumor excision revealed B-cell lymphoma. Neurologic status revealed a T10 ASIA D injury, with impaired lower extremity pin and light touch sensation with asymmetric vibration sense loss; the left was worse than the right. Biopsy results showed a diffuse large B-cell lymphoma of the bone and soft tissue. Bone marrow biopsy was negative. During inpatient rehabilitation, the patient progressed to functional independence with a straight cane. Within 6 months, strength returned to normal, although sensation remained impaired; light touch was more severe than pin sensation. The patient subsequently underwent chemotherapy and tumor bed radiation therapy.

CASE 2

A 62-year-old man with a history of prostate cancer status after radical prostatectomy and testicular cancer with

Figure 1. Sagittal view. Note radio-opacity of the T7–T8 and T10–T11 vertebral bodies and the loss of the anterior CSF definition behind those vertebral bodies.

Figure 2. Axial view. Note the irregularity of the vertebral body indicative of tumor involvement.

orchiectomy and pelvic and spine radiation therapy presented with bilateral lower extremity weakness and paresthesias. This was associated with back pain with insidious onset and progression over several months. One week before presentation, he developed ascending lower extremity numbness and weakness that resulted in falls. An emergent MRI showed pathologic involvement of the left T10 pedicle and transverse process with paraspinous and intraspinal extension. Cord compression was noted from T9 to T11. T9 and T10 laminectomies were completed, and subtotal excision of the epidural mass was accomplished. Biopsy showed a large B-cell lymphoma. Bone marrow biopsy was confirmatory. Neurologic examination showed an L1 ASIA D type injury with present but impaired sacral sensation and severely decreased bilateral lower extremity proprioception. The patient proceeded to in-patient rehabilitation and achieved functional independence with a cane with intact strength and pin sensation and moderately decreased light touch and vibration sense. Chemotherapy and tumor bed radiation therapy were completed.

DISCUSSION

Epidural lymphoma is an unusual presentation of lymphoma, accounting for 4% of all presenting cases of lymphoma (6). It is almost invariably of the B-cell type, although indolent B-cell and T-cell variants are rarely seen (7). The rates of this presentation are multiplying because of the increasing incidence of secondary tumors from prior cancer treatment (8), as seen in our second case. Clinical presentation includes bone involvement with back pain and epidural spread with cord compression with motor and sensory deficits and bowel and bladder incontinence. The mechanism of presentation can be caused by epidural spread from paraspinal node involvement, as seen in the second case, or from bone marrow involvement with extension by way of penetrating vessels into the subarachnoid space (9). Only the former mechanism could be considered primary B-cell lymphoma if a solitary mass is present. Spread from bone marrow is indicative of generalized disease.

Epidural B-cell lymphoma does not necessarily result in a poor prognosis. One study included 7 patients, for a 4% case presentation, that consisted of 4 men and 3 women with thoracic and lumbar epidural masses. Tumor types included high-grade non-Hodgkin lymphoma of B-cell type (n = 4), indolent B-cell lymphoma (n = 1), nodular sclerosing Hodgkin lymphoma (n = 1), and plasmacytoma (n = 1). Advanced disease with positive bone marrow examination was subsequently identified in all 7 patients. Despite this, survival varied greatly with therapy, from 3 weeks to almost 6 years. This finding underscored the need for correct classification of the lymphoma to optimize chemotherapeutic choices (6).

Another study of 18 patients showed the absence of bony involvement on radiographic images in 16 of the cases. All patients underwent laminectomy for decompression and tissue diagnosis, after which 5 underwent radiotherapy, 3 underwent chemotherapy, and 10 underwent combined modality treatment. The functional outcome was improvement in 8 patients, and there was no change in 10 patients. Eleven had advanced disease at diagnosis, whereas 7 had limited disease, including 3 patients with localized extradural lymphoma. There were 16 cases of non-Hodgkin lymphoma and 2 cases of Hodgkin disease. Two patients had T-cell lymphoma and were among the longest survivors. At a mean observation time of 41.7 months, 5 patients died of their disease, and 7 remained in complete remission. Survival was markedly better than that reported for other malignant extradural tumors (10).

Other cases of B-cell lymphoma of the epidural space resulted in functional community ambulation by 10 months and remission of at least 2 years in a patient with laminectomy, decompression, and biopsy followed by field radiation therapy and modified CHOP (cyclophosphamide, Adriamycin, vincristine, and prednisolone) chemotherapy (11). This is consistent with our 2 cases, where community level ambulation without an assistive device was achieved by both patients. By 1 year after injury, one had a normal neurologic examination, whereas the other still had evidence of dorsal column dysfunction below the level of injury. Both of the patients presented in this paper were treated with combined chemotherapy and radiation therapy and achieved complete remission. This is despite the fact that one had a positive bone marrow biopsy, and the other had evidence of multilevel vertebral body involvement.

In the 2 cases reported, the patients had incomplete neurologic injury with a good prognosis for functional independence. A high level of independence was realized during the in-patient stay. In both cases, posterior column dysfunction was noted that affected balance but did not interfere with independence or safety. These 2 cases support the findings in the literature already

reported, namely that higher level of independence and better neurologic examination is associated with less virulent disease and better survival.

CONCLUSION

B-cell lymphoma of the epidural space is increasing in incidence and can be the initial presentation of cancer. Decompression with biopsy together with radiologic and bone marrow examinations allows for correct diagnosis and staging for treatment recommendations. Commonly, combined radiation and chemotherapy regimens are used. Although prognosis is guarded, functional independence with disease remission is not uncommon in these patients.

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