

A CASE OF LEPTOMENINGEAL DISEASE PRESENTING AS A LUMBAR NERVE ROOT RADICULOPATHY

A Case Report

JOHN W. REGGARS D.C., M.Chiro.Sc. *

SIMON D. FRENCH B.App.Sc.(Chiro). †

Abstract:

Objective: To discuss a case of leptomenigeal disease mimicking a lower lumbar disc lesion and accompanying neurological deficit.

Clinical Features: A 62 year old male presented with a 3-4 day history of left low back and left posterior thigh pain. The patient had a previous history of non-specific low back pain for approximately 10-25 years, which was relieved in the past by manual therapy. He was also currently being treated by a medical oncologist with chemotherapy for low grade non-Hodgkin's lymphoma, which was considered stable.

Intervention and Outcome: After a favourable initial response to therapy, the patient developed a noticeable left-sided limp. Computed tomography scanning of the lumbar spine and pelvis was then performed, which revealed a mild posterior annular bulging of the intervertebral disc at the L4/5 level. The patient was then treated with axial lumbar spine traction but on review two days later had also developed a left sided facial droop, consistent with a Bell's palsy. A subsequent magnetic resonance imaging scan of the brain and lumbar spine revealed sites of abnormal enhancement of multiple cranial nerves, the cauda equina and the vertebral bodies L1 and L5. The findings were consistent with widespread leptomenigeal disease or leptomenigeal carcinomatosis and unfortunately the patient died as a direct consequence of the disease approximately three weeks after diagnosis.

Conclusion: Although relatively rare, leptomenigeal disease must be considered as a differential diagnosis in a patient with a history of carcinoma who presents with low back pain and/or any neurological signs and symptoms.

Key Indexing Terms: Non-Hodgkin's lymphoma, leptomenigeal disease/carcinomatosis, radiculopathy, lumbar disc herniation, chiropractic, spinal manipulative therapy.

* Private Practice,
33 Wantirna Road,
Ringwood, Victoria, Australia. 3134.

† Private Practice,
33 Wantirna Road,
Ringwood, Victoria, Australia. 3134.

INTRODUCTION

Leptomenigeal disease (LMD) may be a complication of non-Hodgkin's lymphoma (NHL) and other carcinomas, and may present as a localised spinal nerve root radiculopathy. This case report describes a patient with an 8 year history of low grade NHL, who presented to a chiropractor's office for the treatment of low back and leg pain. The patient was initially diagnosed and treated as a case of lumbar disc herniation. Plain film radiology and computed tomography (CT) scanning of the lumbar spine and pelvis failed to detect any sinister pathology of the soft tissue or bone. It was not until more widespread neurological deficits had developed and a magnetic resonance imaging (MRI) scan of the brain and spine was performed that LMD was diagnosed. This case report highlights the sensitivity of MRI scanning in the detection of LMD and the need to consider LMD in the differential diagnoses for any patient with a history of carcinoma, who presents with back pain and/or neurological deficit.

CASE REPORT

Mr. GH, a 62 year old male engineer presented with a 3-4 day history of left low back pain and posterior thigh pain extending to the knee. There were no obvious precipitating factors and the pain did not appear to worsen over time. Mr. GH had experienced similar episodes of low back pain over the previous 10-15 years that responded successfully with spinal manipulative therapy (SMT). The most recent episode was four months earlier, at which time the patient was discharged from care after two treatment sessions involving hot moist packs, soft tissue massage and SMT. Mr. GH's previous significant medical history was an 8 year history of low grade NHL, which had responded to intravenous chemotherapy, oral chlorambucil and prednisolone. His last chemotherapy, some 9 months earlier, had shown excellent partial results. However, he had persistent left cervical lymphadenopathy.

On review by his oncologist some 4 months later Mr. GH was suffering increased sweating as well as enlargement of his cervical lymph nodes. He also had a small left groin node, swelling of the lower limbs and lethargy. A CT Scan at that time revealed extensive retrocaval and retroperitoneal lymphadenopathy, as well as pleural effusion. This suggested that the disease was progressive

in nature with the possibility that it was entering the leukaemic phase. Further chemotherapy resulted in an excellent response, with almost total resolution of his cervical node swelling, sweats and leg swelling. A follow-up CT scan showed persisting but decreased subcarinal lymph nodes. At this point in time the patient's oncologist planned to continue with further chemotherapy in approximately 2 months time.

Physical examination of the lumbar spine revealed restricted and painful forward flexion, restricted right lateral flexion and rotation bilaterally. A positive right 'Slump' test was noted, while straight-leg-raise was 70° bilaterally, causing low back pain only. A positive right femoral nerve stretch test was also present. No sensory or motor deficit could be detected except that no lower limb tendon reflexes could be elicited. Palpation of the lumbar spine paravertebral musculature revealed moderate right-sided spasm and tenderness at the L4/5 vertebral level. A provisional diagnosis of an L4/5 disc herniation was made. The patient was treated with hot moist packs, soft tissue massage and gentle side-posture SMT directed at the L4/5 level.

In view of this patient's previous medical history and the insidious onset of his symptoms he was referred for a lumbar spine and pelvis plain film radiography. The x-ray examination revealed a mild scoliosis convex to the left with some early anterior osteophytic lipping to the L2/3 vertebral body, but no focal bone destructive lesion was



Fig. 1 Plain film Anteroposterior projection depicting a mild scoliosis.



Fig. 2 Plain film lateral projection depicting anterior osteophytic lipping.

evident (Figures 1,2). A further treatment three days later provided substantial relief of this man's low back and leg pain.

However, on review one week later he had developed a noticeable right sided limp. Muscle testing of the right quadriceps muscle revealed marked weakness. Treatment was then provided consisting of long axis traction and the patient was referred for a lumbar spine and pelvis CT scan. The CT scan revealed a mild posterior annular bulging of the intervertebral disc at the L4/5 level and minor osteophytic lipping of the disc margins at L2/3 and L1/2 (Figure 3). Diverticular disease was present throughout the pelvic colon without any pelvic mass lesions or free pelvic fluid.

On presentation two days later the patient stated that he had obtained some temporary pain relief from the traction therapy but had also developed a left sided facial droop. On examination the patient was unable to close the left eye, wrinkle the forehead on the left, or retract the left side of his mouth. In light of his current symptomatology the patient was immediately referred to his oncologist for review. A subsequent MRI scan of the brain and lumbar spine revealed abnormal enhancement of the pituitary stalk, the both third cranial nerves, both fifth cranial

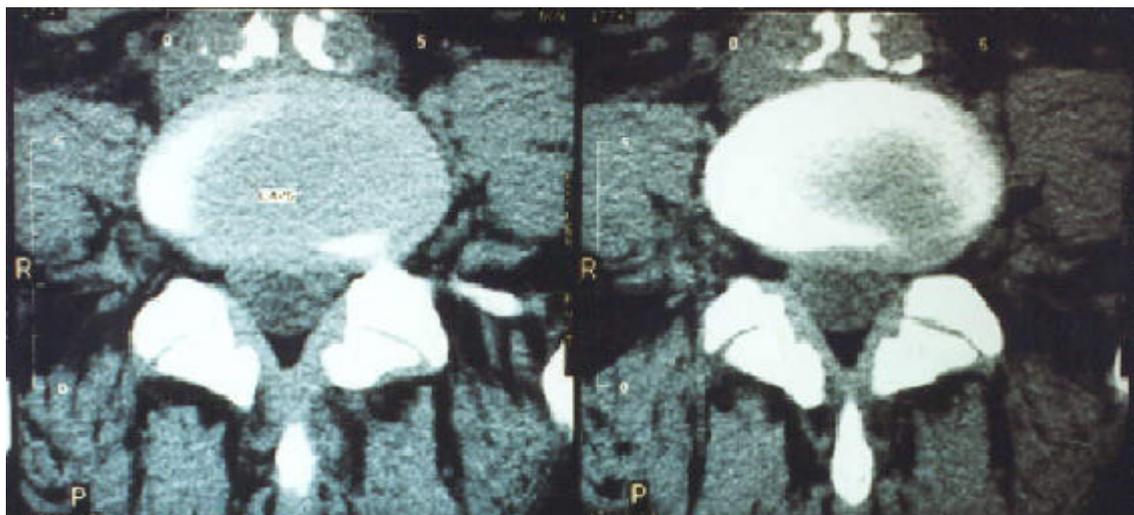


Fig. 3 Lumbar spine CT scan at the L4/5 level, depicting mild posterior annular bulging.

nerves, and the seventh and eighth cranial nerve complexes bilaterally. There was questionable enhancement of the optic chiasm, the ependymal surface of the lateral ventricles superolaterally and the descending portion of the left facial nerve. The lumbar spine images showed a generalised loss of signal intensity from the marrow of the vertebral bodies, suggesting lymphoma infiltration. Focal increased signal intensity of the L1 and L5 vertebral bodies suggested either focal fatty transformation or possibly haemangioma (Figure 4). There were also numerous small nodular densities in relation to the roots of the cauda equina (Figure 5). The findings were consistent with widespread leptomeningeal disease. The patient was treated with intrathecal Methotrexate as well as his ongoing Dexamethasone therapy and showed a marked



Fig. 4 MRI scan of lumbar spine revealing L1 and L5 vertebral body infiltration.



Fig. 5 MRI scan of cauda equina revealing enhancement and enlargement of multiple nerve roots

improvement in his neurological symptoms. Unfortunately the patient died approximately three weeks after treatment commenced.

DISCUSSION

Epidemiology

Malignant lymphomas consist of two major subgroups: Hodgkin's disease and non-Hodgkin's lymphoma. The larger of the two groups is NHL, and has also been termed lymphocytic lymphoma.¹ Malignant lymphomas are the seventh most common cause of death, and their incidence has been increasing over the last 30 years. The mortality rate for patients with NHL is also slightly increasing in the community. The annual incidence of NHL is 10 to 15 cases per 100 000 people.² Males are slightly more often affected than females. The peak age incidence is between the ages of 60 to 70.

Leptomeningeal metastases may arise from a number of different primary carcinomas. The most common tumors to metastasize to the meninges are breast and lung carcinoma, and melanoma.³ Leptomeningeal involvement in these carcinomas ranges from 2.5% in breast carcinomas, up to 23% in melanomas. Improved treatment regimens of many primary tumours, resulting in prolonged survival, has lead to an increasing incidence of metastatic complications. The sagacious clinician must therefore be aware of this possible complication when dealing with patients who have been previously diagnosed with carcinoma.

Aetiology

The aetiology of NHL is unknown. There is some speculation that it is related to Epstein-Barr Virus, acquired immunodeficiency conditions as well as autoimmune diseases. There have also been some environmental agents implicated in the aetiology of NHL, including dioxin, diphenylhydantoin, radiation and cytotoxic drugs.

Clinical Presentation

Up to two thirds of patients present with enlarged peripheral lymph nodes, most commonly involving cervical lymph nodes, followed by inguinal, axillary and epitrochlear nodes. Lymphadenopathy is most commonly caused by infectious disease, and for this reason, infectious disease must first be ruled out before a patient is subjected to an invasive barrage of diagnostic tests. It is generally recommended that an enlarged lymph node that persists for 3-4 weeks after initiation of appropriate therapy should be biopsied. Mediastinal, retroperitoneal and mediastinal lymph node involvement is also common. Infiltration of the spleen, the liver and the bone marrow is seen in about half of patients at the time of diagnosis, and symptoms of the involvement of these organs may be the first clinical symptoms of the disease. Later in the course of the disease extranodal and extralymphatic involvement may occur in the brain, leptomeninges, lungs, stomach, small intestine, testes and brain. The diagnosis of NHL is primarily based on the histopathology of the biopsied lymph node.

Secondary central nervous system metastases usually occur in patients with diffuse carcinoma. The term most commonly used to describe this infiltration is leptomeningeal carcinomatosis. The entire nervous system may be seeded with metastases, or may involve any part of the nervous system. Thus the signs and symptoms on presentation may vary. Most common presentations are confusion, headache, difficulty with gait, or back pain with or without radiation.⁴

The prognosis of carcinoma with leptomeningeal involvement is very poor. Median survival in untreated patients is 4 to 8 weeks. This may be extended to 6 months in some patients with aggressive treatment.³

CONCLUSION

Although relatively rare, LMD must considered as a differential diagnosis in a patient with a history of carcinoma and who presents with low back pain, and/or any neurological signs and symptoms. This case highlights the fact that LMD may initially present with signs and symptoms of a lumbar nerve root radiculopathy from a suspected lumbar intervertebral disc herniation, as well as the high sensitivity of MRI scanning in the detection of LMD.

REFERENCES

1. DeVita VT jr, Hellman S, Rosenberg SA (eds). Cancer: principles and practice of oncology. 4th ed. Philadelphia: J.B. Lippincott, 1993.
2. Love RR (ed). Manual of clinical oncology. 6th ed. Berlin: Springer-Verlag, 1994.
3. Balm M, Hammack J. Leptomeningeal carcinomatosis: presenting features and prognostic factors. Arch Neurol 1996; 53(7): 626-32
4. Theodore WH, Gendelman S. Meningeal carcinomatosis. Arch Neurol 1981; 38: 696-9.