

An Uncommon Cause of Sciatica

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ABSTRACT

A 67-year-old male patient underwent a left nephrectomy for a renal cell carcinoma. Thirty-eight months later, he presented with right sided lower backache, radiating to the posterior aspect of his thigh, calf and foot, paraesthesiae and numbness in the distribution of the right S1 and S2 dermatomes. The presumptive diagnosis was of nerve root entrapment secondary to a disc prolapse. MRI scan of the lumbosacral spine revealed an enlarged S1 root canal containing a solid solitary lesion suggestive of a neurofibroma of the S1 nerve root. Because of persistent pain, he underwent a right L5/S1 hemilaminectomy. A lesion originating from the right S2 nerve root was found and excised. The patient made an uneventful postoperative recovery with complete resolution of his right leg pain. The histopathological examination revealed a portion of the nerve root and dorsal root ganglion infiltrated by metastatic renal cell carcinoma. Although uncommon, nerve root infiltration by a metastasis should be included in the differential diagnosis of back pain and sciatica, especially if there is a previous history of malignant disease.

Key words: Spinal nerve root. Metastasis. Renal cell carcinoma.

INTRODUCTION

Metastatic deposits to the spine are common, but intradural spinal canal metastases are much rarer, accounting for 6% of all spinal metastases.¹ Intradural metastases are most commonly found in the cervical cord, followed by the thoracic and then the lumbar region. Lung and breast cancers and malignant melanoma are the three most common causes of spinal metastases.² Renal Cell Carcinoma (RCC) is known to metastasize to the lungs (50%), bone (49%), lymph nodes (6%-32%), liver (8%), and brain (3%).³ Intradural spinal metastases from a renal cell carcinoma are very unusual, but have been described in the literature with spread to the cauda equina.¹ A literature search has not revealed any previous report of lumbar or sacral nerve root infiltration with RCC metastasis.

In this case report, we describe a patient with metastatic RCC affecting the right second sacral nerve root presenting with right sided sciatic nerve pain and compression symptoms. Despite the history of malignant disease the diagnosis was delayed and initially missed on MRI.

CASE REPORT

A 67-year-old man had undergone a left nephrectomy for a renal cell carcinoma. Thirty-eight months later, he

suddenly developed pain in the right side of the lower back, radiating to the posterior aspect of his thigh, calf and foot associated with paraesthesiae and numbness in the right S1 and S2 dermatomes. He attributed his pain to a fall onto his right hip whilst on a bus. The pain started immediately after the fall and was described as sharp, excruciating and burning in character. He was admitted to hospital for further investigation. On examination, no tenderness was elicited in his lower back and the tendon reflexes were normal in all four limbs with normal power. He was found to have numbness in the sole of his foot (S1). The Straight Leg Raise (SLR) on the right side was limited to 30 degrees, both actively as well as passively. Plain radiographs of his pelvis and right hip were normal. All routine blood tests were normal.

He was managed conservatively with analgesia and physiotherapy with no sustained benefit.

Two months after failed conservative treatment, he was admitted to an acute orthopaedic ward with persistent right lower limb pain. Back pain was not a prominent feature. No new abnormalities were found on clinical examination, but there was a slight improvement in his right SLR, which was thirty degrees actively and sixty degrees passively. An MRI scan of his lumbar spine showed no evidence of nerve root entrapment. He continued to have remissions and relapses with pain in his right buttock, thigh and calf. He was now using a walking stick to mobilise, having previously been independently mobile.

As he continued to struggle with his symptoms despite conventional medical treatment, he was further investigated with an isotope bone scan and myeloma screen and prostatic specific antigen levels, all of which were within normal limits. At this stage, he was found to

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have reduced right ankle jerk, but neurological examination was normal. Four months later, a repeat MRI scan of his lumbar spine revealed a large, swollen right S1 nerve root within the S1 root canal. Detailed MRI scan of his sacrum, particularly of right S1 nerve root canal then revealed a solid lesion arising from the right S1 nerve root (Figure 1 and 2). The appearances were consistent with the diagnosis of a neurofibroma. A L5/S1 hemilaminectomy was performed, but exposure of the S1 nerve root only showed what appeared to be a thickened nerve root, but no tumour. Intra-operative X-rays confirmed that the hemilaminectomy was at the correct level. The hemilaminectomy was then extended to expose the S2 nerve root and a tumour was visualised arising from the S2 nerve root. The tumour was excised, preserving the S2 nerve root as much as possible. The patient made an uneventful postoperative recovery and was discharged home within a week, mobilising independently with complete resolution of his right leg pain.

The histopathology of the specimen revealed a portion of nerve root and dorsal root ganglion infiltrated by a tumour consisting largely of clusters of clear cells of epithelial appearance, in keeping with those of a metastatic renal cell carcinoma (Figure 3). Immunocytochemistry confirmed the presence of tumour cells strongly expressing EMA and to a lesser extent cytokeratin (CAM 5.2) but were negative for S100 protein (Figure 4). The original nephrectomy histopathology was reviewed revealing a renal carcinoma of

similar appearance to the tumour infiltrating the S2 nerve root. There was a high risk of metastases as the tumour involved the renal vein at the hilum, and the tumour breached the renal capsule although the resection margin was clear. Three years later following surgery and radical radiotherapy to the sacrum the patient remains well. There has been no recurrence of right leg pain.

DISCUSSION

Sacral radiculopathy may result from a number of unusual causes: a ruptured S1-S2 disc presenting with S2 radiculopathy, migration of intracranial hemostatic clip into the lumbar spinal canal causing sacral radiculopathy, lumbosacral radiculopathy secondary to intraspinal synovial cyst formation, spinal gas collection causing lumbar radiculopathy and symptomatic Tarlov cysts.⁴⁻⁸ Tumours can metastasis to the lumbosacral spine, giving rise to radiculopathy, when they compress the nerve roots.^{9,10} Amyloid pseudotumour of the first sacral nerve root accounted for the symptomatology in a French case report¹¹ but we could not find any published data on metastatic infiltration of the lumbar or sacral nerve roots by renal cell carcinoma.

A patient presenting with an acute onset of low back pain radiating into the lower limb in a nerve root distribution is mostly due to a herniated nucleus pulposus,⁶ and is usually managed conservatively unless there are symptoms and signs of major neurological involvement, or if the symptoms persist beyond 6 weeks. Risk factors for cancer-related low back pain include age, older than 50 years, previous history of cancer, pain lasting longer than one month, pain made worse by recumbency, and no response to conservative treatment.¹⁰

In this case, the patient had a firm belief that his pain started after his fall onto his right hip. The only reason he warranted a MRI was failure of conservative treatment. The first MRI scan failed to reveal the underlying cause and it was the second examination, which demonstrated a solid lesion in what appeared to be the S1 nerve root. Pre-operatively, there were no characteristic features identified on the MRI scan, to suggest the presence of a metastasis rather than a simple neuroma. Interestingly, in the operating theatre, the tumour was found to be arising from the second sacral nerve root and was excised through L5/S1 extended hemilaminectomy. The patient has been mobilising independently without any neurological deficit, to-date.

We recommend MRI of the lumbosacral region as the modality of choice in investigating unusual causes of low back pain. The diagnosis could be easily missed on a computer tomography scan or on a myelogram. Where there is a clear clinical diagnosis of nerve root pain, but



Figure 1: Axial STIR sequence MRI. It demonstrates a solitary high signal lesion in the right S1 nerve root with no significant expansion or adjacent bone edema.

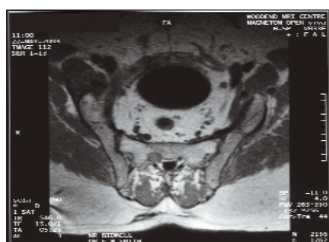


Figure 2: Axial T1 weighted non-fat suppressed MRI. It demonstrates a low signal well-defined lesion with no significant adjacent bone destruction or sclerosis. Note the small apex to the lesion, suggestive of an intrathecal extension.

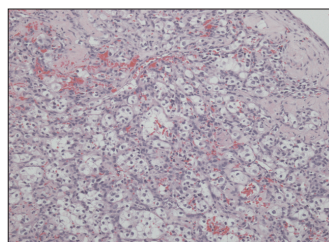


Figure 3: Histology of nerve root tumour showing typical appearances of metastatic renal carcinoma (Haematoxylin and Eosin, original objective magnification x10).

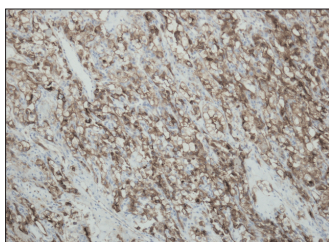


Figure 4: Tumour showing strong staining for epithelial membrane antigen (immunocytochemistry for EMA, original objective magnification x10).

imaging of the lumbosacral spine is normal, it is necessary to look for more distal lesions in the sacrum or pelvis. Furthermore, if there is a past history of malignant disease, the development of back pain and sciatica should be considered to be due to metastatic disease, especially in patients with atypical clinical course. The diagnosis of metastatic disease should be considered in the diagnostic work-up of these patients.

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