# Diagnostic Snapshot

## Atypical Radiculopathy in an Oncology Patient

Mark Davis, PA-C
From Texas Oncology, Fort Worth, Texas
Correspondence to: Mark Davis, PA-C, 6500 Harris Parkway, Fort Worth, TX 76132. E-mail: mark.davis@usoncology.com
https://doi.org/10.6004/jadpro.2020.11.7.10

**Abstract**
Practitioners face significant challenges when evaluating patients with cancer who suffer from back pain. Back pain is one of the most common reasons for patients to visit medical providers. This case study will review a patient with cancer presenting with atypical radicular pain.

### HISTORY

Mr. OH is a 73-year-old male who presented with a nonproductive cough for 1 month and an unexplained 20-pound weight loss. He presented his symptoms to his internist who then ordered a CT scan of the chest. The scan revealed three lung nodules: a 3.2 × 1.7 cm nodule in the right upper lobe of the lung, a 2.6 × 2.2 cm nodule in the right lower lobe, and a 1.8 × 2.3 cm nodule in the left upper lobe. There was also a 3.3 × 2.2 cm subcarinal lymph node enlargement in addition to multiple bone lesions involving the thoracic vertebra. Mr. OH was referred to a medical oncologist who then ordered CT imaging of the abdomen and pelvis. Liver metastasis was identified and biopsied, and came back positive for small cell lung cancer. An MRI of the brain with and without contrast performed shortly thereafter revealed a 1.8 × 1.6 × 1.2 cm right superior cerebellar lesion with surrounding edema and 0.9 × 0.8 × 0.8 cm left posterior temporal lobe lesion. Mr. OH was subsequently treated with whole-brain radiation therapy followed by carboplatin and etoposide for 6 cycles. Restaging CT imaging of the chest, abdomen, and pelvis 6 weeks later showed a partial response to treatment outside of the brain metastasis. An MRI of the brain was repeated 3 months later and showed the improved right superior cerebellar lesion measuring 1.2 × 1.4 × 0.9 cm and left posterior temporal lobe lesion measuring 0.7 × 0.4 × 0.4 cm.

### PRESENTATION

Four months after completion of chemotherapy, Mr. OH experiences an abrupt onset of a burning sensation in his lateral right thigh radiating into his inner thigh. No back pain is reported at this time. Mr. OH has a prior history of degenerative disc disease of the lumbar spine with radiculopathy. There is no loss of bowel or urinary control. Because of the progressive nature of his pain, an MRI of the thoracic and lumbar spine with and without contrast is obtained.




DIFFERENTIAL DIAGNOSIS

### WHAT IS THE CORRECT DIAGNOSIS FOR MR. OH'S WORSENING BACK PAIN?

A. Lateral femoral cutaneous nerve entrapment
B. Intradural extramedullary metastasis
C. Degenerative disc disease with nerve root impingement

SEE BACK FOR ANSWER

## WHAT IS THE CORRECT DIAGNOSIS FOR MR. OH'S WORSENING BACK PAIN?

A Lateral femoral cutaneous nerve entrapment

B Intradural extramedullary metastasis (correct answer)

C Degenerative disc disease with nerve root impingement

A **Lateral Femoral Cutaneous Nerve Entrapment.** Patients will experience radiating pain down the thigh, and in advanced stages, fixed sensory loss on the lateral thigh. Those with obesity, diabetes mellitus, advanced age, and those who are pregnant or postpartum are predisposed to meralgia paresthetica (Parisi, Mandrekar, Dyck, & Klein, 2011). Mr. OH does not possess any of the above mentioned risk factors, which essentially eliminates the possibility and should only be considered after the integrity of the spine has been evaluated.

B **Intradural Extramedullary Metastasis.** Seen in fewer than 5% of those autopsied after death from cancer, intradural extramedullary metastasis is typically caused by drop lesions, prostate cancer, breast cancer, melanoma, or lymphoma (Traul, Shaffrey, & Schiff, 2007). Radicular pain may be the only symptom, as the tumors develop outside of the vertebra. Any number of mechanisms could be the cause for metastatic spread; however, etiology is irrelevant once intradural metastasis is indicated. The patient is then in an advanced disease state and prognosis is poor no matter the cause (Land, Bowden, Morpeth, & DeVine, 2019). Mr. OH's clinical picture is consistent with intradural metastasis and diagnosis was confirmed based on a lumbar puncture with positive cerebral spinal fluid for malignant cells consistent with small cell lung cancer.

C **Degenerative Disc Disease With Nerve Root Impingement.** Because more than 85% of patients seen in primary care complain of nonspecific low back pain (Deyo & Weinstein, 2001), providers must have knowledge of the most common locations of degenerative disc disease in order to distinguish cancerous from noncancerous-related back pain. Degenerative disc disease is most often found in the cervical spine and lumbar spine, while spinal metastasis is found at the thoracic vertebra (60%–80%), lumbar spine (15%–30%), and cervical vertebra (< 10%; Maccauro et al., 2011). To adequately distinguish between degenerative disc disease and bone metastasis, MRI is needed and is considered the gold standard in the evaluation.

## FOLLOW-UP

Mr. OH underwent MRI of the cervical thoracic and lumbosacral spine. An enhancing intradural mass was found at the level of the L1 to L2 measuring 1.5 × 1.0 cm. Mr. OH's MRI results of the spine are consistent with intradural spinal metastasis as the result of drop metastasis from his previously treated brain lesion. Subsequently, a lumbar puncture was performed and sent for cytology. The cytology came back consistent with small cell lung cancer. Following the identification of the drop metastasis, Mr. OH underwent subsequent stereotactic radiation therapy. Mr. OH had a short-term response and eventually succumbed to the cancer with disease progression within 5 months (Figure 1).

Figure 1

## DISCUSSION

The majority of metastatic spine tumors are extradural, occurring in the osseous structures outside of the dural sac. These tumors can result in neurologic complications by directly invading the spinal cord or by causing pathologic fracture of the vertebrae, with resultant neurologic compromise. Less commonly, metastatic tumors can arise in the intradural space, either intramedullary (within the spinal cord) or extramedullary (outside the spinal cord but within the dura). In some cases, intradural metastasis can result from downward spread of intracranial or spinal

cord tumors, and method of spread termed drop metastasis. While rare, it most commonly occurs in patients who have had some type of surgical intervention performed on a tumor within the central nervous system. As a result, it is believed that the seeding of the tumor occurs via cerebral spinal fluid and that gravity possibly plays a role in the development of drop metastasis most commonly seen in the lumbosacral spine (Choi & Shapera, 2006). Confirming the diagnosis can be challenging due to frequent negative cytology results from cerebrospinal fluid. MRI imaging along with clinical presentation can assist in the diagnosis if surgical intervention is not being considered.

The prognosis for patients with drop metastasis is most commonly very poor. The median overall survival typically ranges from 4 to 15 months based on retrospective data collected from various cancer types (Akhavan, Mehrabaniyan, Jarahi, & Navabii, 2012). Unfortunately, there are no prospective trials comparing commonly used modalities to manage intradural metastasis. Most data are based on case studies involving decompressive laminectomies, radiotherapy, chemotherapy, or a combination of these treatments. Each patient's care requires interdisciplinary collaboration and individualized treatment management based on radiosensitivity of the tumor and overall prognosis (Delank, Wendtner, Eich, & Eysel, 2011).

## Disclosure

Mr. Davis has consulted for Amgen, Celgene, Incyte, Janssen, and Takeda.

## References


Akhavan, A., Mehrabaniyan, M. R., Jarahi, M., & Navabii, H. (2012). Intradural extramedullary metastasis from papillary carcinoma of thyroid. *BMJ Case Reports, 2012*. https://doi.org/10.1136/bcr.02.2012.5801

Choi, P.P., & Shapera, S. (2006). Drop metastases. *Canadian Medical Association Journal, 175*(5), 475. https://doi.org/10.1503/cmaj.060308

Delank, K. S., Wendtner, C., Eich, E. T. & Eysel, P. (2011). The treatment of spinal metastases. *Deutsches Arzteblatt International, 108*(5), 71–79. https://doi.org/10.3238/arztebl.2011.0071

Deyo, R. A., & Weinstein, J. N. (2001). Low back pain. *New England Journal of Medicine, 344*(5), 363–370. https://www.nejm.org/doi/full/10.1056/NEJM200102013440508

Land, C. F., Bowden, B. D., Morpeth, B. G., & DeVine, J. G. (2019). Intradural extramedullary metastasis: A review of literature and case report. *Spinal Cord Series and Cases, 5*, Article number: 41. https://doi.org/10.1038/s41394-019-0181-0

Maccauro, G., Spinelli, M. S., Mauro, S., Perisano, C., Graci, C., & Rosa, M. A. (2011). Physiopathology of spine metastasis. *International Journal of Surgical Oncology, 2011*, 1–8. https://doi.org/10.1155/2011/107969

Parisi, T. J., Mandrekar, J., Dyck, J. B., & Klein, C. J. (2011). Meralgia paresthetica: Relation to
obesity, advanced age, and diabetes mellitus. *Neurology, 77*(16), 1538–1542. https://doi.org/10.1212/WNL.0b013e318233b356

Traul, D. E., Shaffrey, M. E., & Schiff, D. (2007). Spinal-cord neoplasms—intradural neoplasms. *The Lancet Oncology, 8*(1), 35–45. https://doi.org/10.1016/S1470-2045(06)71009-9