

Case Report

Intramedullary conus metastasis from carcinoma lung

Sandip B. Mavani, Trimurti D. Nadkarni, Naina A. Goel¹

Departments of Neurosurgery and ¹Neuropathology, King Edward Memorial Hospital, Seth Gordhandas Sunderdas Medical College, Parel, Mumbai, Maharashtra, India

Corresponding author: Prof. Trimurti D. Nadkarni, Department of Neurosurgery, King Edward Memorial Hospital, Seth Gordhandas Sunderdas Medical College, Parel, Mumbai - 400 012, Maharashtra, India. E-mail: tdnadkarni@hotmail.com

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Abstract

A 46-year-old male presented with progressive paraparesis and sensory impairment in both lower limbs since 2 months. He had urinary and bowel incontinence. On examination he had flaccid paraplegia with a sensory level at 11th dorsal vertebral level. Magnetic resonance imaging (MRI) scans of the lumbosacral spine showed an enhancing intramedullary lesion in the conus. The patient underwent excision of the conus mass. Histopathology confirmed the tumor to represent a poorly differentiated metastatic carcinoma from an unknown primary. A positron emission tomography-computed tomography (PET-CT) scan of the whole body revealed hypermetabolic activity in the hilum of the right lung confirmed to be a lung carcinoma on a CT-guided biopsy. The patient was undergoing chemoradiation at 1 month follow-up. The author's literature search has yielded only four other case reports of conus metastasis of which only one is in English literature. The present case report and review of literature are presented.

Key words: Carcinoma lung, conus medullaris metastasis, intramedullary metastasis

INTRODUCTION

Intramedullary spinal cord tumors have been predominantly primary tumors such as ependymomas and astrocytomas. Intramedullary spinal cord metastasis (ISCM) is rare. Metastasis to the spinal cord is uncommon and the actual number varies from 0.9 to 2.1% for autopsied cancer patients^[1] to as much as 3.9% in other studies^[2] of which nearly 50% arise from primary lung cancer.^[3] A case of intramedullary lung metastasis to the conus has been reported only once earlier in English literature.^[4]

CASE REPORT

A 46-year-old male had presented with progressive paraparesis associated with sensory impairment in both lower limbs since 2

months. He had incontinence of urine and stool. At the time of presentation he had flaccid paraplegia with a sensory level at 11th dorsal vertebral level (D11). One month prior to presentation to us, the patient had undergone an unsuccessful attempt at excision of the conus mass. Magnetic resonance imaging (MRI) of the dorsolumbar spine showed a discrete homogenously enhancing mass within the conus at the D12 level [Figure 1]. D11 to L1 laminectomies were noted [Figure 2]. The tumor was seen as on the earlier scan as it had not been biopsied. The previous midline incision over D11 to L1 was reexplored. The conus was exposed. A posterior midline myelotomy was performed on the conus at the site of the tumor bulge. A grey colored firm mass was noted. A gross total excision of the tumor could be achieved. Histopathology showed a poorly differentiated metastatic carcinoma [Figure 3]. There was cellular and nuclear atypia, mitotic activity, pleomorphism along with scattered bizarre cells. There were vascular emboli with areas of hemorrhage.

The patient underwent a positron emission tomography-computed tomography (PET-CT) scan of the whole body that revealed hypermetabolic activity in the hilum of the right lung. A review of the chest radiograph showed a right hilar lung mass, which had been missed earlier [Figure 4]. A CT guided biopsy of the hilar mass confirmed the diagnosis of lung adenocarcinoma.

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Figure 1: Post-contrast sagittal magnetic resonance (MR) image of dorsolumbar spine shows a discrete intramedullary conus tumor opposite D12 vertebra



Figure 2: Post-contrast sagittal MR image of dorsolumbar spine shows the conus tumor and posterior laminectomies after first surgery

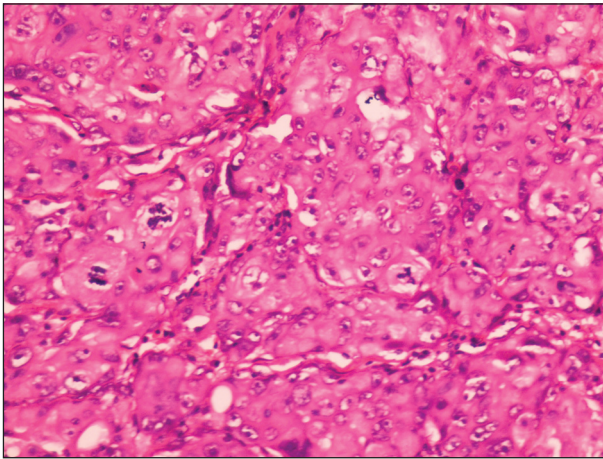


Figure 3: Photomicrograph showing large polyhedral epithelial cells with vesicular nuclei, prominent nucleoli, and glassy eosinophilic cytoplasm. Brisk mitotic activity is noted. (hematoxylin and eosin (H and E), 400x)

The patient was advised chemotherapy for the primary and radiotherapy for the secondary spinal metastasis. At 1 month follow-up the patient was undergoing chemoradiation treatment. The patient had improvement in the motor functions of both lower limbs.

DISCUSSION

The majority of tumors of the spine are extradural, with 55% occurring predominantly in the vertebral bodies and epidural fat.^[5] Of these tumors, metastases are the majority, with primary bone tumors being less common. The opposite is found in the spinal cord, with metastasis to the cord being very rare.^[1,2] Among these lesions, ISCM are rare, comprising only 0.5% of spinal axis metastases. The most common intramedullary spinal cord metastasis is lung (64%), followed by breast (11%), melanoma (5%), renal cell cancer (4%), colon-rectal (3%), lymphoma (3%), and the remaining undiagnosed primary.^[1] The

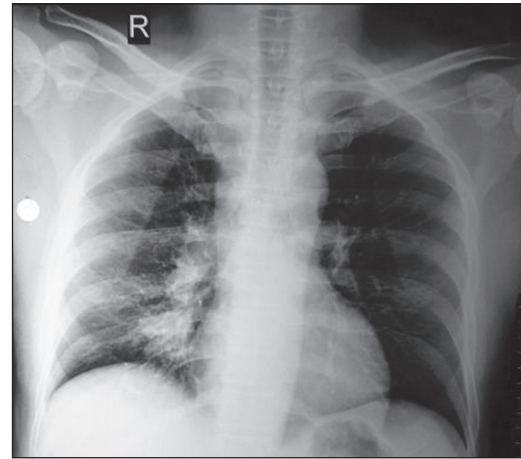


Figure 4: Chest radiograph demonstrates a right hilar mass

lesions are found most often in patients with concomitant brain metastasis.^[6] In patients without history of systemic neoplasia such as the patient in our report, a knowledgeable clinical evaluation coupled with selected laboratory and diagnostic imaging investigations may delineate primary or secondary spinal malignant lesions from other more benign differential diagnostic entities. MRI is useful in determining the extent of CNS involvement which may affect the therapeutic decision making in many patients.^[6,7] These metastases are found at all levels of the spinal cord as follows: Cervical (42%), thoracic (26%), and lumbar region (32%).^[6]

Of the several hundred reported cases of ISCM, the incidence of metastasis to the conus medullaris is very rare and our literature search has yielded only five cases. Of these five, there have been four cases of lung carcinoma metastasis to the conus, one case report in the English literature by Guppy and Wagner^[4], another case in the French literature by Faillot *et al.*,^[8] and two cases in the Japanese literature by Tashima *et al.*^[9] Ramakonar *et al.*, have described the only case of periurethral adenocarcinoma metastasis to the conus medullaris.^[10]

Primary intramedullary tumors tend to be slow growing; however, metastasis have rapid growth associated with progressive neurological deterioration as in the present patient. The neurological presentation of conus medullaris involvement is varied from myelopathy, radiculopathy, and myeloradiculopathy. Paraplegia, paresthesia, sensory changes, erectile dysfunction, and bladder dysfunction have been described as the initial presentation of tumors occurring at the conus medullaris.^[2] Neurogenic claudication has also been described.^[5] Because of its close proximity to the cauda equina, some involvement of spinal nerve roots can be involved with presentation of unilateral symptoms initially.

The underlying pathophysiology of ISCM remains ambiguous. The most probable route of tumor spread include: Hematogenous seeding via the arterial system or Batson's venous plexus; leptomeningeal invasion from embolic seeding via cerebrospinal fluid; direct extension through dura mater or nerve roots; or lymphatic spread from contiguous vertebral metastasis. In this patient, hematogenous spread is the most likely route of involvement.^[4]

ISCM can be the primary presentation of cancer. As seen in our patient, metastasis to the conus was the first manifestation of lung cancer. In another case, a lung adenocarcinoma ISCM at C4-C5 had an acute presentation of Brown-Sequard syndrome.^[11] Schijns *et al.*,^[12] have presented a case in whom symptoms from an intramedullary metastasis from renal cell carcinoma preceded the detection of the primary tumor.

Microsurgical excision of the conus medullaris mass, not only provides tissue for histopathological diagnosis, but also allows early recovery of neurological function. This could be attributed to resolution of the mass effect as well as edema causing tumor. Intramedullary spinal cord metastases tend to be more circumscribed and amenable for total resection. Faillot *et al.*,^[8] advocated radical removal of intramedullary metastasis to the conus medullaris because it can improve the quality and comfort of life, although, as pointed out, it does not affect the survival duration. Isla *et al.*,^[2] on the other hand, have advocated partial resection with the goal of preserving existing function as the best choice for treatment.

The prognosis for these ISCM patients is poor in general. When the patients' general condition is good, surgery can relieve pain and preserve or stabilize neurologic function. With recent advances in the treatment of cancer, depending on the primary tumor, some of these patients' life expectancy can be long. In general, however, most of these patients have already had significant systemic involvement by the time it has reached the spinal cord. Schiff and O'Neill,^[13] in reviewing 40 patients with spinal cord metastasis, found a median survival of 6 months for surgery and radiation, versus 4 months for those only receiving radiotherapy. Their finding was consistent with that of Grem

et al., who found that more than 80% of patients died within 3 months after diagnosis of ISCM.^[14]

CONCLUSION

In conclusion, metastasis to the conus medullaris is rare and may be the first manifestation of a primary cancer. Rapid progression of neurological symptoms should warrant reimaging and may indicate metastasis to the spinal cord, especially in patients with previously diagnosed cancer. PET-CT of the whole body may detect small lesions before they become symptomatic as well as detect clinically unknown primaries. Though the prognosis for ISCM patients is poor, early detection and appropriate treatment of such cancer patients may ameliorate symptoms and prolong good quality life.

REFERENCES

1. Findlay JM, Bernstein M, Vanderlinden RG, Resch L. Microsurgical resection of solitary intramedullary spinal cord metastases. *Neurosurgery* 1987;21:911-5.
2. Isla A, Paz JM, Sansivirini F, Zamora P, Garcia Grande AG, Fernandez A. Intramedullary spinal cord metastasis. A case report. *J Neurosurg Sci* 2000;44:99-101.
3. Ateaque A, Martin JL, O'Brien. Intramedullary spinal cord metastases from a hypernephroma 11 years following the diagnosis and treatment of the primary lesion. *Br J Neurosurg* 2000;14:474-6.
4. Guppy KH, Wagner F. Metastasis to the conus medullaris: Case report. *Neurosurgery* 2006;59:E1148.
5. Gasser TG, Pospiech J, Stolke D, Schwedchheimer K. Spinal intramedullary metastasis. Report of two cases and review of the literature. *Neurosurg Rev* 2001;24:88-92.
6. Jacobs WB, Perrin RG. Evaluation and treatment of spinal metastases: An overview. *Neurosurg Focus* 2001;11:e10.
7. Post MJ, Quencer RM, Green BA, Montalvo BM, Tobias JA, Sowers JJ, et al. Intramedullary spinal cord metastases, mainly of nonneurogenic origin. *AJR Am J Roentgenol* 1987;148:1015-22.
8. Faillot T, Roujeau T, Dulou R, Blanc JL, Chedru F. Intramedullary spinal cord metastasis: Is there a place for surgery? Case report and review of literature [in French]. *Neurochirurgie* 2002;48:533-6.
9. Tashima M, Ono N, Noguchi T, Ishikawa H, Kamakari K, Terada Y. Two cases of intramedullary spinal cord metastasis of lung cancer detected with MRI [in Japanese]. *Nihon Kokyuki Gakkai Zasshi* 2003;41:320-3.
10. Ramakonar HH, Thomas A, Lind CR. Intramedullary conus medullaris metastasis of periurethral adenocarcinoma. *J Clin Neurosci* 2011;18:567-9.
11. Aryan HE, Farin A, Nakaji P, Imbesi SG, Abshire BB. Intramedullary spinal cord metastasis of lung adenocarcinoma presenting as Brown-Sequard syndrome. *Surg Neurol* 2004;61:72-6.
12. Schijns OE, Kurt E, Wessels P, Luijckx GJ, Beuls EA. Intramedullary spinal cord metastasis as a first manifestation of a renal cell carcinoma: Report of a case and review of the literature. *Clin Neurol Neurosurg* 2000;102:249-54.
13. Schiff D, O'Neill BP. Intramedullary spinal cord metastases: Clinical features and treatment outcome. *Neurology* 1996;47:906-12.
14. Grem JL, Burgess J, Trump DL. Clinical features and natural history of intramedullary spinal cord metastasis. *Cancer* 1985;56:2305-14.

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