

Case reports

Spinal metastasis of occult lung carcinoma causing cauda equina syndrome

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Abstract

Cauda equina syndrome (CES) may be caused by tumor, herniated disc, trauma and spinal infections. However, CES due to occult lung cancer has not been reported in the literature. A 50-year-old man presented with a subacute CES caused by an intradural metastasis of an adenocarcinoma of the lung to the lumbosacral cauda fibers. His lumbosacral magnetic resonance imaging (MRI), showed a well-demarcated, intradural extramedullary mass lesion resembling a neurinoma at the L4/5 level. The patient underwent an L4–L5 laminectomy. The operative findings were also suggestive of neurinoma with involvement of three nerve roots, and a well-demarcated tumor without infiltration into the subarachnoid space. Although the findings of the operation were suggestive of neurinoma, final pathological diagnosis revealed metastatic carcinoma. Immunohistochemistry revealed clear cell adenocarcinoma metastasis. Chest X-ray and high resolution contrasted pulmonary computed tomography were normal. Positron emission tomography (PET) showed a lung mass, at the left apex. The patient was treated with chemotherapy and post-operative spinal radiotherapy was also performed. The CES resolved after the operation and the patient was followed up for 2 years with no recurrence.

MRI of intradural cauda equina metastasis may be similar to that of intradural nerve sheath tumor. Surgery and postoperative radiotherapy may be effective for the treatment of CES due to lung carcinoma. Definitive diagnosis is by histopathological examination with immunohistochemistry. If the primary cancer cannot be detected by conventional radiological techniques, PET may be helpful.

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1. Introduction

Hematogenous intradural cauda equina metastasis is a rare condition. We identified only 11 other cases in the literature with metastatic tumor of the cauda equina from a lesion outside the central nervous system.^{1–11} These cases are presented in Table 1. The first case with CES due to metastatic lung carcinoma was reported in 1976 by Coutinho.² The second is our case and unlike the former the presenting symptom was CES. We report this patient with an intradural cauda equina tumor at L4/5, initially misdiagnosed as a neurinoma, but finally diagnosed by histopatho-

logic and immunohistochemical examinations, and by PET as lung adenocarcinoma metastasis. The literature is reviewed with reference to tumor pathology, clinical findings and route of metastasis to the cauda equina.

2. Case report

A 50-year-old male presented with a 2-week history of low back pain, which worsened when he was recumbent or with sneezing, and was progressively becoming more severe, with recent complaints of urinary and bowel incontinence. His medical history was unremarkable. On physical examination, the patient complained of low back pain projecting into the right L5 region. Laseque sign was negative. He had full muscle strength and intact peripheral sensation, but his perianal sensation was decreased. Routine biochemical investigations and direct chest and lumbosacral X-rays were

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Table 1
Cases of cauda equina metastasis in the literature

First author	Year	Sex	Age	Origin	Therapy	Overall survival	Diagnostic tool	CES
Mullins ¹⁴	1971	M	45	Lymphosarcoma	Surgery	Unknown	Myelography	No
Coutinho ²	1976	M	60	Lung, undifferentiated carcinoma	Surgery	Unknown	Myelography	No
Hargraves ¹¹	1986	F	51	Endometrial carcinoma	Surgery	Unknown	Myelography	Yes
Simpson ¹⁵	1986	M	44	Nasopharyngeal carcinoma	Surgery	Unknown	Myelography	No
Takahashi ¹⁶	1990	M	51	Grawitz tumor	Surgery	12 m	MRI	Yes
Cho ¹	1995	M	59	Anal carcinoma	Surgery	Unknown	MRI	Yes
Rivano ¹⁷	1996	F	51	Ovarian	Surgery	Unknown	MRI	No
Schaller ¹⁰	1998	M	79	Prostate carcinoma	Chemotherapy	12 m	MRI	No
Maxwell ⁸	1999			Renal cell carcinoma	Surgery	Unknown	MRI	No
Mak ⁷	2001	M	55	Renal cell carcinoma	Surgery	13 m	MRI	No
Kubota ⁶	2003	M	68	Renal clear cell carcinoma	Surgery	Alive	MRI	No
Gaetani ¹²	2004	F	36	Renal clear cell carcinoma	Surgery	12 m	MRI	Yes
Kotil	2004	M	51	Occult lung adenocarcinoma	Surgery	Alive	MRI	Yes

CES = cauda equina syndrome.

normal at admission. Lumbosacral MRI revealed an intradural extramedullary mass measuring 3.4 cm craniocaudally and 2.1 cm anteroposteriorly at the L4/5 level (Fig. 1A, B). In addition, sagittal MRI demonstrated an enlarged bladder. The mass was well demarcated and demonstrated homogenous contrast enhancement. It was T1 isointense, T2 hyperintense (Fig. 2A,B). Radiologically, these MRIs suggested intradural cauda equina neurinoma or ependymoma and the patient underwent L4–5 laminectomy. After dural opening, the mass was found entwined in the cauda equina, with the appearance of a neurinoma. The tumor was reddish-gray, infiltrated three sacral nerves and was mildly vascularized. We resected three sacral nerves proximal and distal to the tumor and removed the tumor easily. These surgical findings are typical for nerve sheath tumors but are exceptional for metastatic lung carcinoma. Pathological examination demonstrated metastatic lung cancer. On histopathological examination, there was tumoral infil-

tration in the nerve roots. Light microscopic examination (Fig. 3A) revealed that the tumor cells were large, spherically nucleated with prominent nucleolus, some of the cells being transparent, while others were eosinophilic. The cells created groups, masses and alveolar structures. Desmoplasia was present. The tumor was infiltrated with dilated blood vessels and mononuclear inflammatory cells. These findings led us to suspect a metastatic carcinoma. Since the origin of the carcinoma had not been detected, immunohistochemistry was applied. This showed that the tumor cells had strong nuclear positivity for thyroid transcription factor 1 (TTF 1) (Fig. 3B). All of these findings supported the diagnosis of metastatic carcinoma originating from the lung.

2.1. Follow-up

Of primary concern was the urogenital system, especially renal cell carcinoma, particularly for a cauda equina

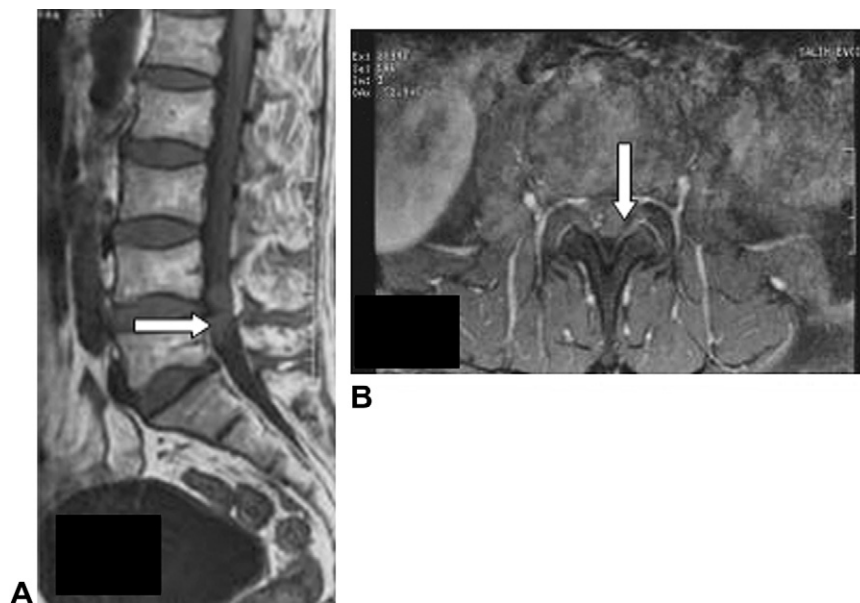


Fig. 1. Lumbosacral MRI T1-weighted image in the sagittal plane (A) and axial plane (B) showing an intradural extramedullary mass located at the L4/5. The tumor is bilobulated.

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