

Spinal Metastasis of Occult Lung Carcinoma Causing Cauda Equine Syndrome with Lumbar Spinal Stenosis

Lomber Dar Kanal Zemininde Kauda Equina Sendromuna Sebep Olan Akciğer Karsinomu Metastazı

Tufan CANSEVER¹, Serdar KABATAS¹, Erdinc CIVELEK¹, Cem YILMAZ², Hakan CANER²

¹Baskent University, Faculty of Medicine, Department of Neurosurgery, Istanbul, Turkey

²Baskent University, Faculty of Medicine, Department of Neurosurgery, Ankara, Turkey

Correspondence address: Tufan CANSEVER / E-mail: drtufan@gmail.com

ABSTRACT

AIM: Cancers that metastasize to the cauda equina are uncommon. Only seventeen cases were reported. Those from pulmonary squamous cell carcinoma was never been published to our knowledge.

MATERIAL and METHODS: A 79-year-old male patient presented with low back pain since 1 year and severe sacral pain irradiating to the left leg, paraparesis, urinary dysfunction and leg weakness since one week.

RESULTS: Preoperative magnetic resonance images of the lumbar spine showed an intradural spinal mass in L2-3 with infiltration of the cauda equina; the lesion measured 13 mm craniocaudally and 11 mm anteroposteriorly, and thus occupied the majority of the intrathecal space at that level. The magnetic resonance images, surgical treatment, and related pathophysiology are reviewed.

CONCLUSION: The majority of cauda equina tumors are primary tumors, and metastases are very rare. Especially old patients with intradural mass and rapidly progressive cauda equina syndrome should be evaluated for a primary malignancy to avoid an unnecessary spinal operation.

KEYWORDS: Squamous cell carcinoma, Intradural, Cauda equina, Laminectomy

ÖZ

AMAÇ: Kauda equina metastazları oldukça nadir görülmektedir ve literatürde sadece 17 vaka bildirilmiştir. Günümüze kadar skuamöz hücreli akciğer karsinomu metastazı hiç bildirilmemiştir.

YÖNTEM ve GEREÇ: Bir yıldır sakral bölgeye ve sol bacağı yayılan bel ağrısı ve son bir haftadır da paraparezi, üriner disfonksiyonu olan 79 yaşında erkek hasta değerlendirildi.

BULGULAR: Ameliyat öncesi temin edilen manyetik rezonans incelemelerinde L2-3 seviyesinde kauda equinayı infiltre etmiş; 13x11 mm boyutlarında ve o seviyede intratekal mesafenin büyük bir kısmını işgal etmiş intradural lezyon saptandı. Manyetik rezonans inceleme sonuçları, uygulanan cerrahi tedavi ve tümör yayılımının patofizyolojisi tartışıldı.

SONUÇ: Kauda equina tümörlerinin büyük bir kısmı primer lezyonlardır. Özellikle yaşlı hastalarda hızla ilerleyen kauda equina sendromuyla karşılaşıldığında hastalar doğru tedavi planlamasının yapılabilmesi amacıyla ayrıntılı olarak araştırılmalıdır.

ANAHTAR SÖZCÜKLER: Skuamöz hücreli karsinom, İnadural, Kauda equina, Laminektomi

INTRODUCTION

The cauda equina syndrome (CES) refers to a very specific constellation of symptoms resulting from damage to the cauda equina, comprises of the portion of the nervous system below the conus medullaris and consists of peripheral nerves, both motor and sensory, within the spinal canal and thecal sac by extremely variable agents (2).

Cancers that metastasize intradurally to the spinal canal are uncommon, accounting for the 6% of all spinal metastases.

Of all primary lesion types, lung carcinoma (40–85%), breast carcinoma (11%), renal cell carcinoma (4%), lymphoma (3%), and colorectal carcinoma (3%) are the most common types seen in the spine. These tumors may primarily involve bone or may be intradural/extradural in location (2). Those with hematogenous spread from lung squamous cell carcinoma (LSCC) to the cauda equina are especially unusual (1). The first case with CES due to metastatic lung carcinoma (MLC) was reported in 1976 by Coutinho. To date only four reports that describe the spread of MLC to the cauda equina have been

published and none of them was squamous cell carcinoma (SCC) (4, 5, 9). We report an unusual case of CES with lumbar spinal stenosis and intradural lesion in L2-3 level.

CASE REPORT

A 79-year-old man suffering from low-back pain, saddle and perianal hypesthesia, lower-extremity weakness on the left side, urge incontinence and neurogenic claudication in 50 meters was admitted to the hospital. The neurological examination disclosed a patient with positive Laseque sign on the left side, severe paraparesis (2 out of 5), weakness on the dorsiflexion of left ankle (3 out of 5) and urinary retention. Magnetic resonance imaging (MRI) revealed an intradural spinal mass from L2-3 with possible infiltration of the cauda equina; the lesion measured 13 mm craniocaudally and 11 mm anteroposteriorly, and occupied the majority of the intrathecal space at this level (Figure 1A-E). The additional images suggested lumbar spinal stenosis in L3-S1 levels. The patient underwent a L3-L5 total- and L2 hemi-laminectomy. At the dural opening, we found the radices and dissected

gently. A reddish-white hemorrhagic lesion was observed, displaced the majority of the caudal rootlets, some of which ran directly into the tumor. The radices were dissected gently and the tumor was evacuated totally.

Light microscopic examination revealed desmoplastic stroma with solid islands (Figure 2A,B). The tumor cells had enlarged eosinophilic cytoplasm and pleomorphic vesicular nucleus. The cells created groups, masses and alveolar structures. These findings led us to suspect a metastatic carcinoma. Since the origin of the carcinoma had not been detected, immunohistochemistry was performed. It was shown that the tumor cells had strong nuclear positivity for thyroid transcription factor 1 (TTF 1) and cytokeratin AE1/AE3 (Figure 2A,B).

Bone scan with Tc-99m MDP (methylene diphosphonate) revealed multiple foci of increased osteoblastic activity at corpus sterni, mid and lower thoracic vertebra, lumbar vertebra, right sacroiliac joint, left femoral neck, right femur subtrochanteric region (Figure 3). The patient was evaluated as

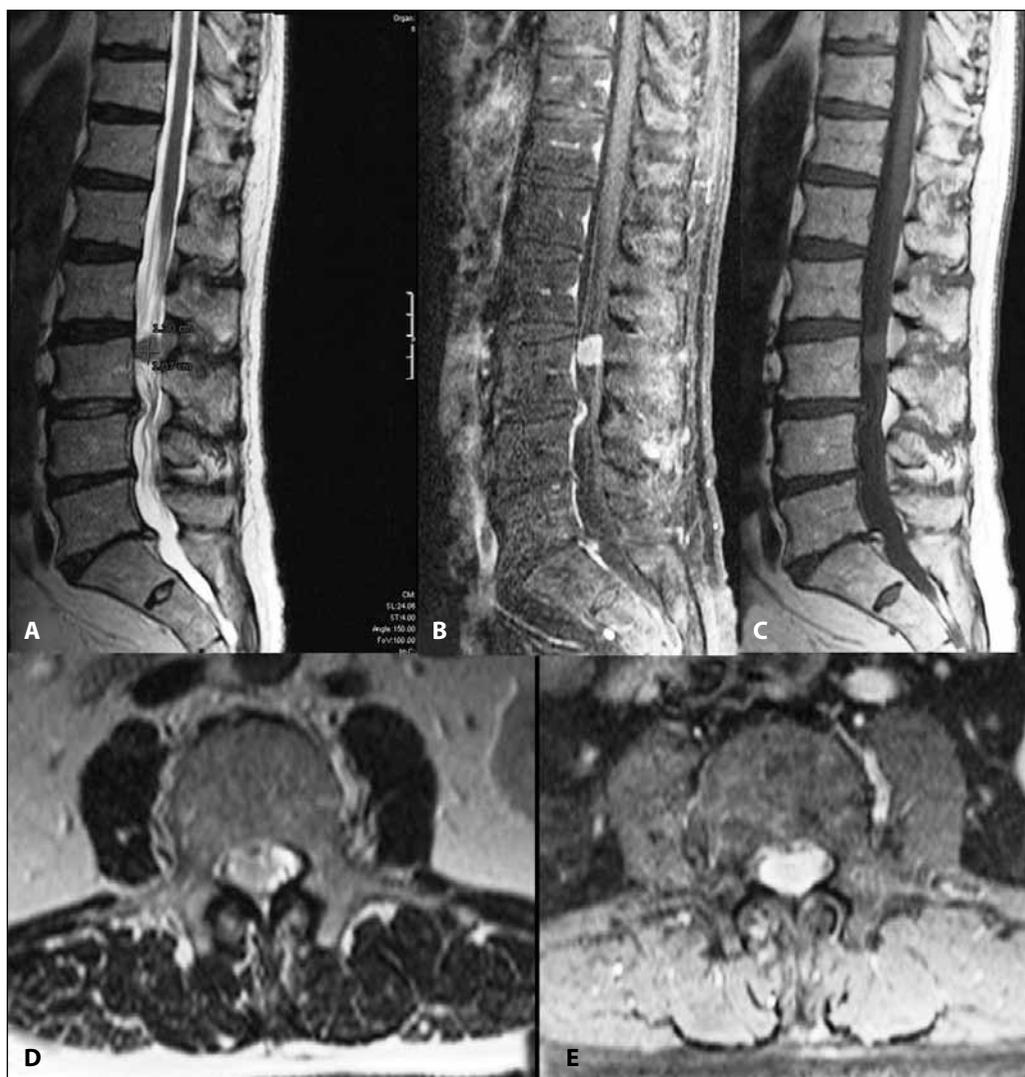


Figure 1A-E: The lesion measured 13 mm craniocaudally and 11 mm anteroposteriorly, and thus occupied the majority of the intrathecal space at L2-3 level. Lumbar spinal stenosis at L3-4 and L5-S1 level can be seen in sagittal images.

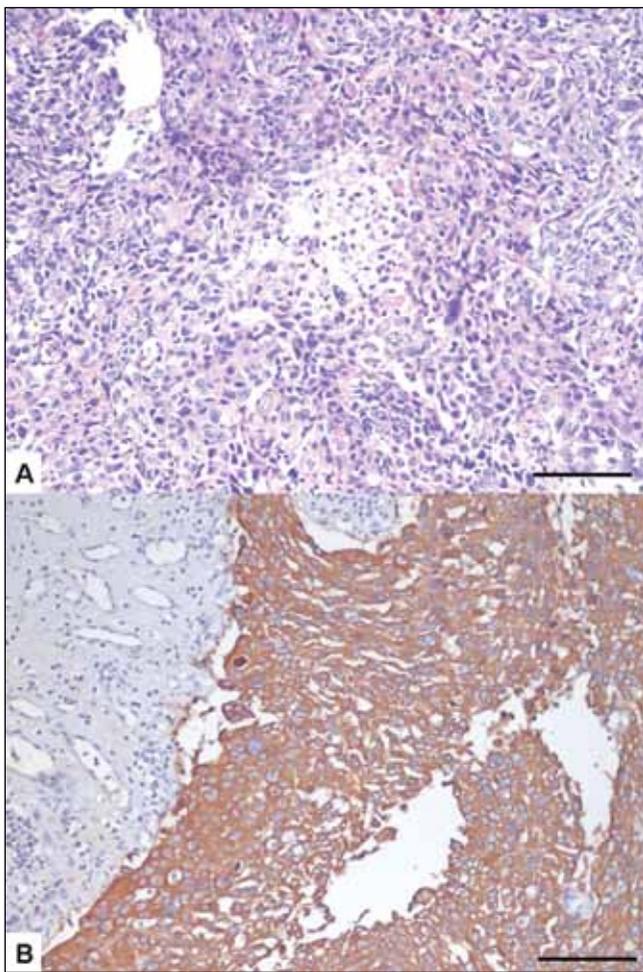


Figure 2A,B: Light microscopic examination revealed desmoplastic stroma with solid islands. The tumor cells had enlarged eosinophilic cytoplasm and pleomorphic vesicular nucleus. The cells created groups, masses and alveolar structures. Immunohistochemistry was showed that the tumor cells had strong nuclear positivity for thyroid transcription factor 1 (TTF 1) and cytokeratin AE1/AE3 (Scale bar = 0.05 mm).

multiple skeletal metastases. The postoperative course was uneventful, and the patient neurologically slightly improved and sent to a rehabilitation and oncology hospital thereafter.

DISCUSSION

CES causes a variety of symptoms, including sciatica; low-back pain; saddle and perianal hypesthesia or analgesia; decreased rectal tone; absent bulbocavernosus, patellar, and achilles reflexes; bowel and bladder dysfunction; and variable amounts of lower-extremity weakness. There are several causes of this syndrome including trauma, central disc protrusion, hemorrhage, and neoplastic invasion (2). In this case CES was caused by both metastatic lesion and lumbar spinal stenosis. Radicular symptoms were caused by direct invasion of left L5 radix in cauda equina.

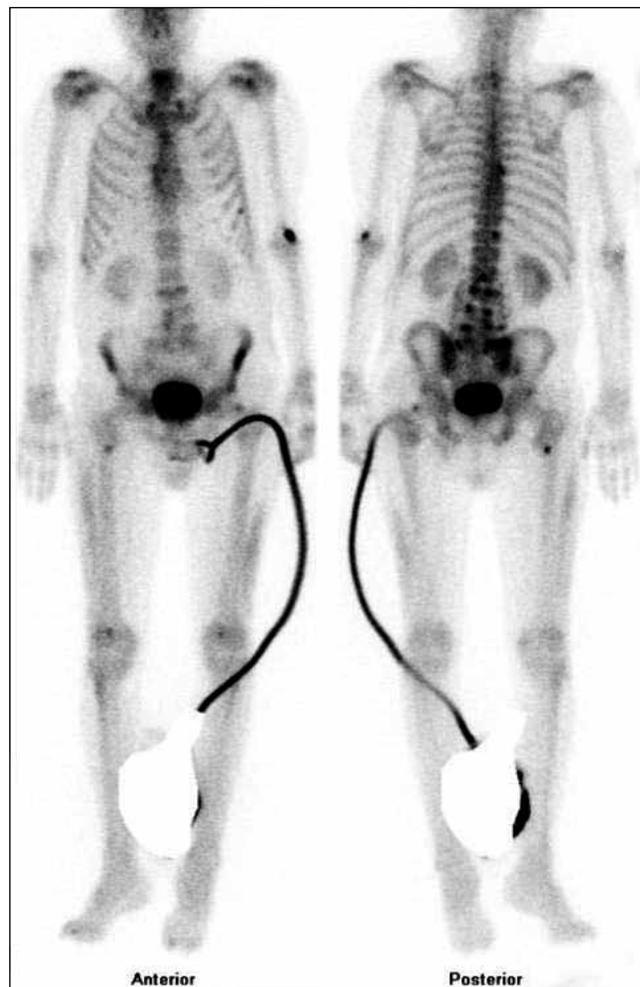


Figure 3: Bone scan with Tc-99m MDP (methylene diphosphonate) revealed multiple foci of increased osteoblastic activity at corpus sterni, mid and lower thoracic vertebra, lumbar vertebra, right sacroiliac joint, left femoral neck, right femur subtrocanteric region. The patient was evaluated as multiple skeletal metastases.

Five routes have been hypothesized for metastatic intradural spinal tumor from outside the central nervous system (10): Haematogenous via the arterial system; through the rich venous plexus; through perineural lymphatics; seeding from involved osseous structures to the cerebrospinal fluid through the dura mater; through an arterial embolism (3, 4, 6, 7, 8, 11, 12, 14, 16, 18, 20).

Besides thoracic mass lesion and thoracic lymph node metastasis (Figure 4), other metastatic masses at a post-contrast scan were found in T12 level neighboring the right pedicle with 6 mm diameter, in S1 level neighboring to left pedicle with 8 mm diameter and 13 mm diameter on right pedicle and 2 more lesions in sacroiliac joint with 15 mm diameter (Figure 5A-C). These findings revealed to be both systematic haematogenous, lymphatic and seeding from osseous structure can be the route of the metastasis.



Figure 4: Thoracic CT revealed irregular bordered, 2,4x1,9 cm primary lesion at upper lobe of the left lung, neighboring to the apical-posterior fissure.

The incidence of cauda equina metastasis due to systemic cancer is not known. In all of the reported cases, pulmonary malignancy was the most common source of cauda equina metastasis.

Of all reported 17 cases, 6 originated from the lung, 5 from the kidney, and 3 from urogenital organs. Pathological findings of the LC were small cell carcinoma in four, adenocarcinoma in 1 and squamous cell carcinoma in our case. (3, 4, 6, 7, 9-13, 15-17, 19).

CONCLUSION

We report a rare metastatic tumor to the cauda equina from the lung, with an undiagnosed lung cancer and CES. Conventional radiological studies could not produce a correct diagnosis, and these tumors may resemble nerve sheath tumors. MRI may not give a specific diagnosis for intradural masses in evaluation of CES. Although ependymoma and schwannoma are the most common intradural extramedullary spinal tumors, metastasis should also be included in the differential diagnosis in patients without any known primary malignancy, especially for elderly patients with additional clinical findings. For this group of patients, clinical and radiological diagnostic work-up for a primary malignancy may avoid an unnecessary spinal operation.

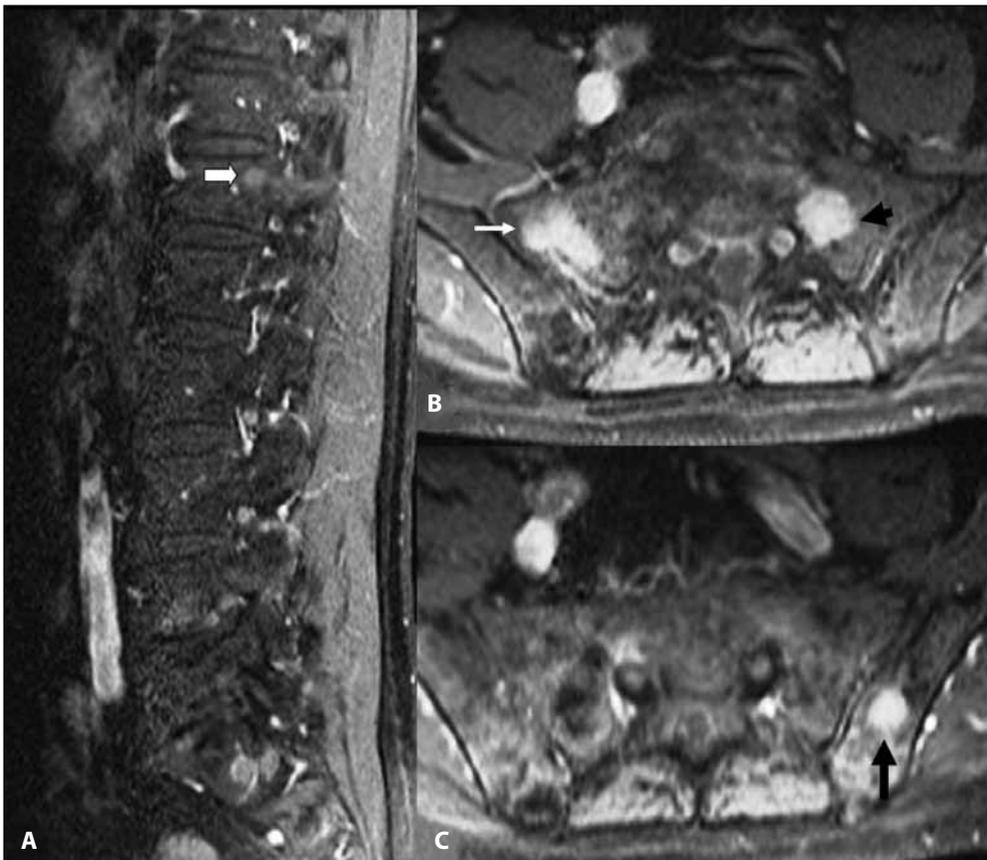


Figure 5A-C: Metastatic masses at a post-contrast scan were found in **A)** T12 level neighboring to right pedicle with 6 mm diameter, in **B)** S1 level neighboring to left pedicle with 8 mm diameter and 13 mm diameter on right pedicle and 2 more lesions (**B,C**) in the sacroiliac joint with a diameter of 15 mm.

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