

# Lumbar Epidural Metastasis of Breast Cancer Resembling Lumbar Disc Herniation

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## Case report

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# Abstract

A 49-year-old woman who had breast cancer suffered from left leg pain. Initial MRI indicated lumbar disc herniation compressing S1 nerve root. The pain was uncontrollable with conservative treatments and she underwent surgical decompression. Intraoperative findings showed that left S1 nerve root was compressed by soft and gray tumor locating ventrally. We resected the tumor and S1 nerve root was adequately decompressed. Bone tissue around the tumor was intact, and there was no finding of bone metastasis. Pathological examination demonstrated adenocarcinoma as same as original breast cancer. We should constantly consider differential diagnosis as metastatic lesion in case of malignancy.

## Introduction

As the prognosis of cancer patient has improved following advance in multimodal treatment, the incidence of metastases to distant organs commonly occur. In breast cancer patients, metastases most frequently occur in the skeleton [1]. Among them, metastasis to vertebral bone is common and it induces neurological deficits. In this report, we demonstrate a rare case of metastases to the lumbar epidural space invading intervertebral disc, facet joint membrane originated from breast cancer which initially seemed lumbar disc herniation.

## Case Presentation

A 49-year-old woman complaining left toe pain and dysesthesia came to our outpatient clinic. She had had breast cancer (Stage  $\text{II}$ , ER+, PgR+, HER2-), bone metastases including sacrum 2 years before seeing us. Biopsy and chemo/hormone therapy were performed for the breast cancer and radiation therapy for the sacrum metastasis. Her primary breast and metastatic lesions had not reoccurred and her activities of daily livings were maintained all by herself until before that time. She suffered from severe pain and exhibited left motor weakness of gastrocnemius, flexor hallucis longus muscles (grade 4/5). However vertebral cancellous bone was broken in part due to previous sacrum metastasis, its cortical continuity was retained at spinal canal on computed tomography (CT). Lumbar magnetic resonance imaging (MRI) appeared like a L5-S1 disc herniation which compressed left S1 nerve root firstly (Fig. 1). Left S1 nerve root block anesthesia temporarily alleviated her pain. Preoperative diagnosis was lumbar disc herniation causing left S1 radiculopathy. Her pain was refractory to conservative treatment; therefore, we underwent surgery. Intraoperative findings made us surprised that epidural severely tight tissue, not herniated nucleus pulposus (HNP), adhered around S1 nerve root. The lesion discolored in dark red and extended into foraminal space along S1 nerve root. Careful detachment and dissection of the lesion as much as possible from the nerve root was performed. Moreover, L5-S1 intervertebral joint bone itself was not destructed, but its membrane discolored in dark red, we cut it out partially. We further made an incision in the L5-S1 disc protrusion, resected its HNP. Finally, we confirmed that left S1 nerve root was absolutely decompressed (Fig. 2).

Pathological findings of all the things surgically removed such as epidural nerve root surroundings, intervertebral disc, and facet membrane contained adenocarcinoma consisted of proliferative atypical cells and pleomorphic nuclear on hematoxylin and eosin (HE) stain. In high-power field, nucleoli in the cells were clearly observed. Undifferentiated pleomorphic sarcoma or malignant melanoma were denied because CD68 and HMB45 immunohistochemical tests were negative (Fig. 3). We definitely determined the lesion was metastases of breast cancer to epidural space around nerve root invading to lumbar disc, intervertebral joint membrane.

After the surgery, her pain in the toes relieved to some extent and improved muscle strength (grade 5/5), MRI showed left S1 nerve root was completely decompressed (Fig. 4). Nevertheless, her pain soon deteriorated. She received local radiation therapy to nerve root surroundings. Subsequently, she unhappily passed away because of systemic multiple metastases after 3 months from the surgery.

## Discussion

In cancer patients, vertebral metastases are typically associated with back pain firstly. Subsequently, metastatic vertebral bone lesion expands to spinal canal, metastatic epidural spinal cord compression (MESCC) occurs in 2.5-10% of cancer patients in the last year of life [2, 3, 4]. In our case, the patient did not complain back pain but only pain in the toes. MRI also appeared that lumbar HNP seemed to put pressure on left S1 nerve root, not seemed to be occurred from sacrum. Therefore, we diagnosed lumbar disc herniation in preoperative setting; However, the pathological examination identified that what we had removed including surroundings around nerve root, facet membrane, and HNP all comprised adenocarcinoma. Hence, the epidural metastasis was thought to be spread from the lumbar intervertebral disc, not sacrum, in this case. To our knowledge, there is no previous report that breast cancer directly metastasizes to epidural space around nerve root invading lumbar disc, facet membrane and our case is the first report so far. It is reported that only ten cases of solid cancers metastases to spinal nerve root ganglia [5].

A previous randomized trial showed that surgery followed by radiotherapy provides better outcomes than radiotherapy alone for the treatment of symptomatic metastatic epidural spinal cord compression [6]. Surgeons should consider operation when patients complaining neurologic dysfunction in the setting of quite spinal cord compression. As in this case, even if we diagnosed metastatic lesion preoperatively, the patient had neurologic dysfunction like pain and motor weakness, it is suitable that we consequently performed surgery after all.

## Conclusions

The metastases to lumbar epidural space not from bony lesion are rarely reported. Even if a lesion seems to be lumbar disc herniation, in the setting of known malignancy, we should keep in mind the possibility of metastasis to epidural space.

# Declarations

## Conflicts of Interest Disclosure

The authors have no conflicts of interest to declare.

## Acknowledgments

The manuscript submitted does not contain information about medical device(s)/drug(s).

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No relevant financial activities outside the submitted work.

## Contributions

TF designed and conducted the study; MU collected the data; YB interpreted the data; YT and KN drafted the manuscript; KM and HK and MS revised the manuscript. All authors approved the final version of the manuscript and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

## Ethics Declarations

### Ethics approval and consent to participate

This study was performed in accordance with the ethical standards of the Ethics committee of Iseikai hospital. Consent to participate was not applicable due to the retrospective design of this study.

### Consent for publication

Written informed consent was obtained from the patient for the publication of this report and any accompanying images.

### Competing interests

The authors declare that they have no competing interests.

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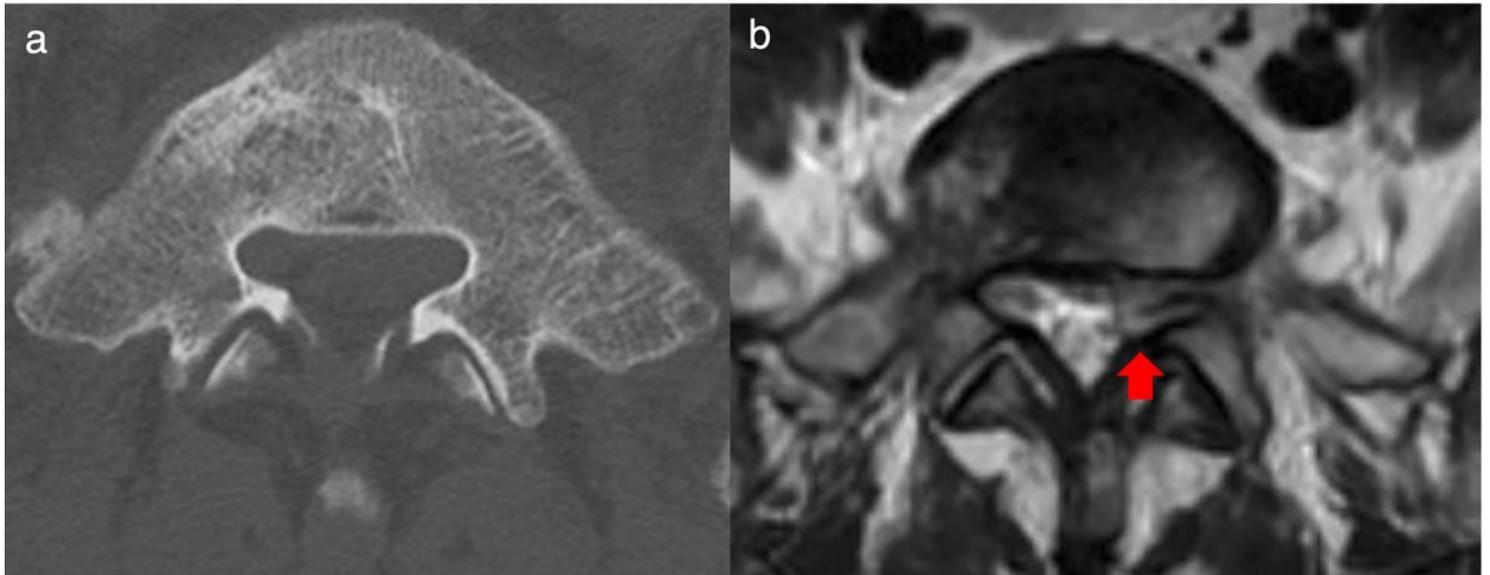
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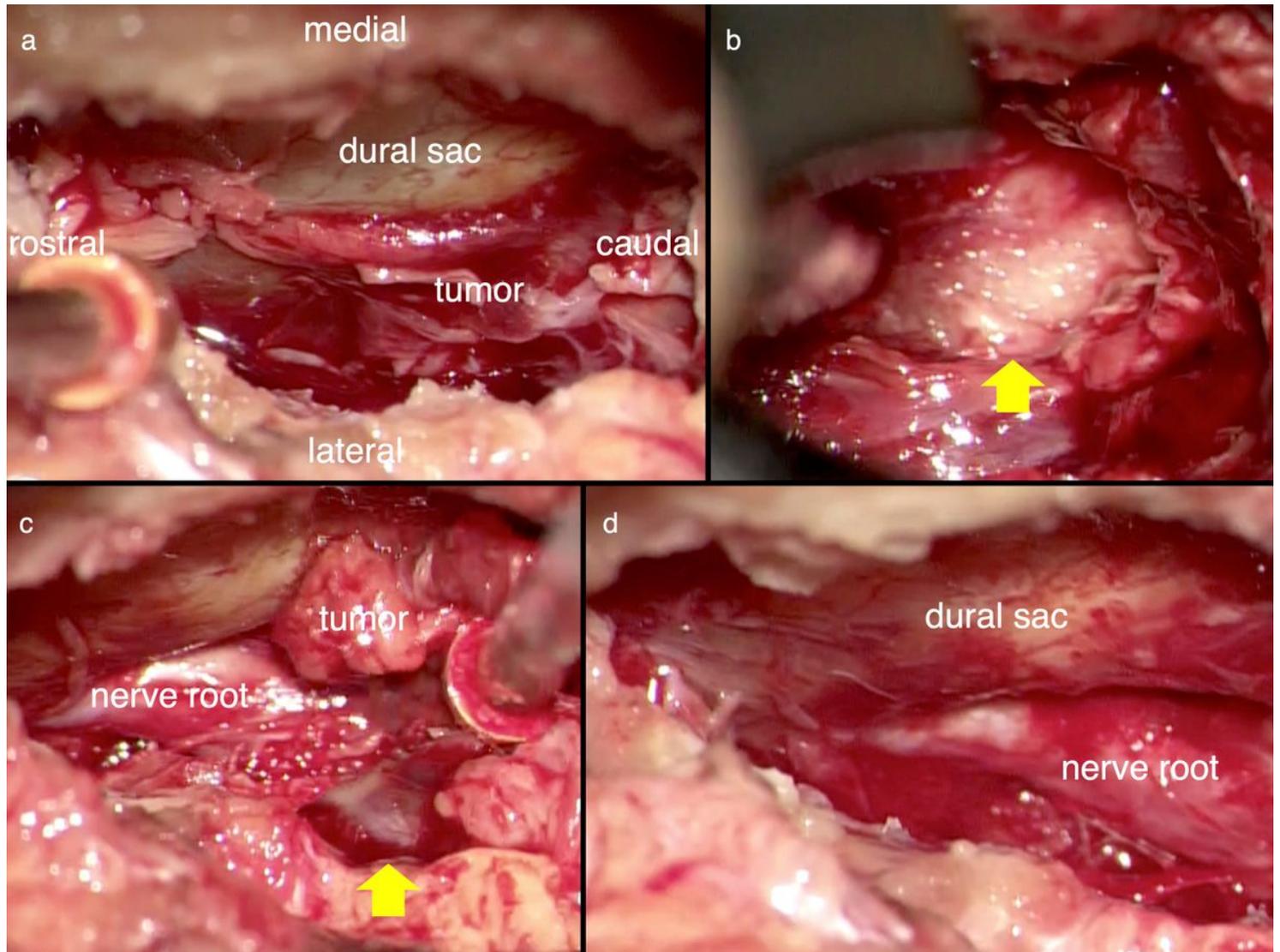
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## Figures



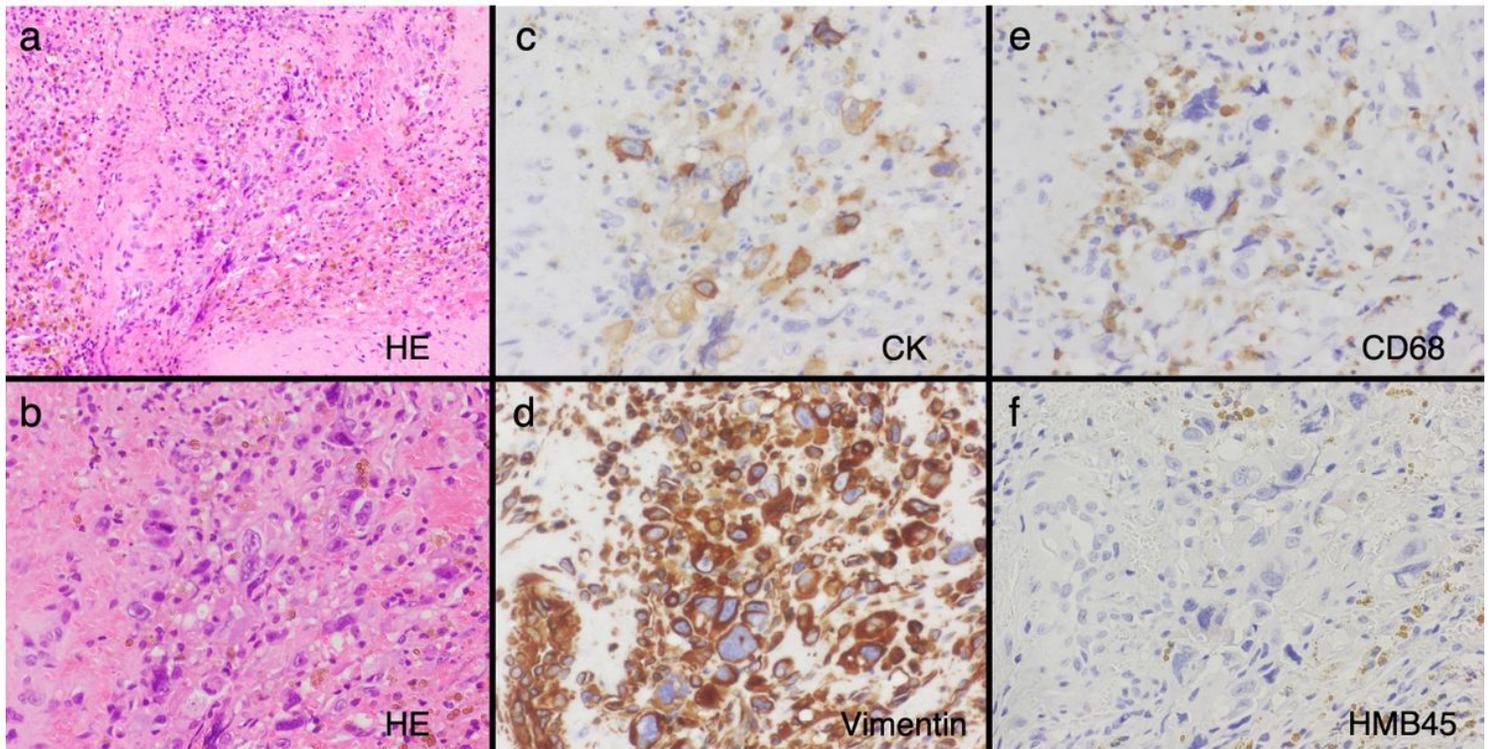
## Figure 1

Preoperative imaging studies at L5-S1 level. (a) Axial bone window CT at S1 lateral recess level where S1 nerve root pass through seemed intact. (b) Left S1 nerve root was obscure (arrow) in axial T2-weighted MRI.



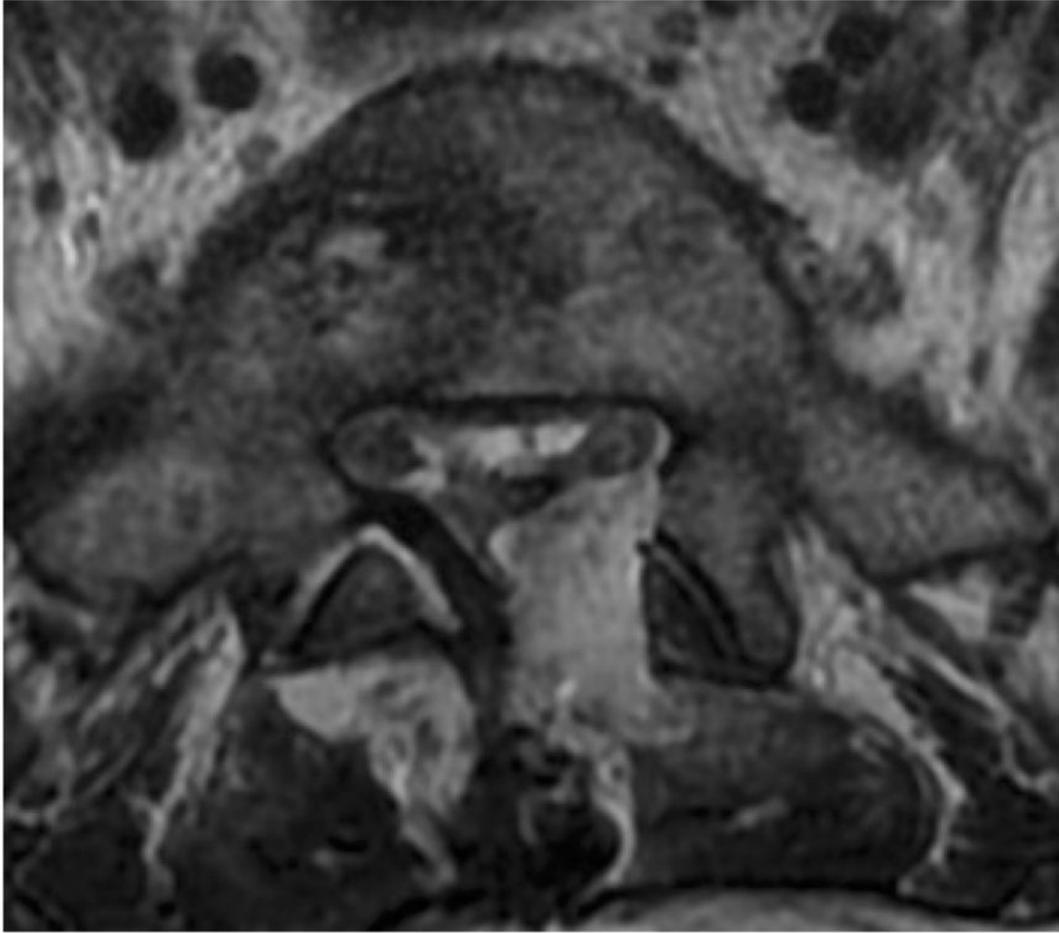
## Figure 2

Intraoperative microscopic viewings (a) Epidural lesion compressed left S1 nerve root. (b) The lesion was not developed from S1 vertebral body (arrow). (c) Left facet joint membrane discolored in dark red and was hypertrophic. (d) Left S1 nerve root was adequately decompressed.



**Figure 3**

Pathological investigation with formalin fixed paraffin embedded tissue (a) On HE staining, atypical and pleomorphic nuclear in low-power field. (b) large nucleus and cytoplasm and nucleoli were observed in high-power field. In immunohistochemical survey, (c) cytokeratin AE1+AE3 (CK), (d) Vimentin were positive, (e) CD68 as a marker of histiocytes, (f) HMB 45 as a marker of melanoma were negative.



**Figure 4**

Postoperative MRI at L5-S1 level. Axial T2-weighted MRI showed left S1 nerve root was completely decompressed after the surgery.