



[Case Report]

Thoracic dumbbell-shaped spinal tumor with contralateral lower extremity pain: a case report

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Abstract

We report a surgically-treated case of a thoracic dumbbell-shaped spinal tumor with contralateral buttock and lower extremity pain. A 72-year-old man was admitted with buttock pain of a right side and right lower extremity pain. A neurological examination demonstrated no motor weakness and no sensory loss of trunk and both lower limbs. Deep tendon reflexes were normal and Babinski signs were negative bilaterally. The right buttock and lower extremity pain was the only initial and major symptom of him. Magnetic resonance (MR) images revealed the presence of a dumbbell-shaped spinal tumor at the left Th9 level. MR image studies for brain, pelvic, and lumbar spine showed no other lesion. We considered that his symptom was caused by the compression of the left spinothalamic tract at thoracic spine level by the spinal tumor. The symptom disappeared immediately after the excision of the spinal tumor. Our experience suggests that thoracic cord compression caused by such as a dumbbell-shaped spinal tumor should be suspected in patients with buttock and lower extremity pain. And the symptom can occur at the contralateral side of the lesion.

Key words: lower extremity pain, sciatica, contralateral symptom, dumbbell-shaped spinal tumor, thoracic spine

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I . Introduction

Spinal cord and/or a nerve root compression at cervical and thoracic spine usually causes myelopathy and/or radiculopathy. Buttock pain and lower extremity pain are relatively rare symptoms in patients with spinal cord compression. However, cord compression is sometimes known to cause pain referred to areas well below the level of the lesion by irritation of the sensory tracts. Here we report a surgically-treated case of a thoracic dumbbell-shaped spinal tumor with contralateral buttock pain and lower extremity pain.

II . Case Report

A 72-year-old man with a history of fall from stairs was admitted with buttock pain of a right side and right lower extremity pain. He had no past medical history. Routine blood tests were normal. He suffered from shooting pain and numbness of his right back through right posterior thigh (Fig. 1). Neurological examination demonstrated no motor weakness and no sensory loss of trunk and both lower extremities. Deep tendon reflexes were normal in both upper and lower extremities. Babinski signs were negative bilaterally. Magnetic resonance (MR) images showed a space-occupying lesion in the vertebral canal located on the middle to left

side at the Th9 level that showed iso intensity with the spinal cord on T1-weighted images (Fig. 2a) and high and low mixed intensity on T2-weighted images (Fig. 2b). MR images showed enhancement of the mass after Gd-DTPA injection (Fig. 2c, d).

Although the tumor was causing extensive spinal cord compression, the neurological symptom was atypical for thoracic myelopathy. We investigated other diseases which could show right buttock and

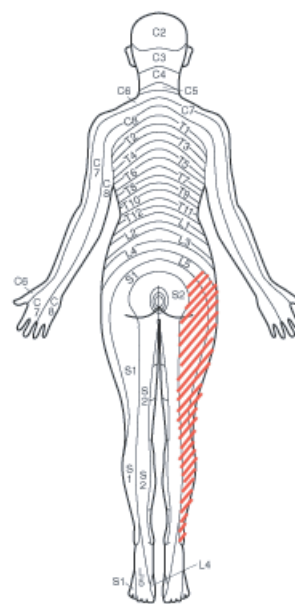


Fig. 1 Dermotome of the patient. He suffered from shooting pain and numbness of his right back through right posterior thigh.

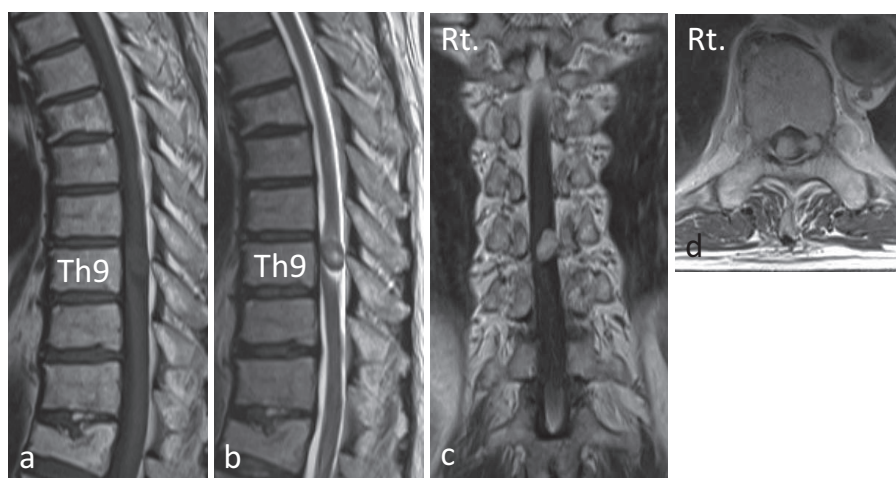


Fig. 2 Preoperative Radiological images. **a**, Preoperative T-1 weighted midsagittal magnetic resonance (MR) image. **b**, Preoperative T-2 weighted midsagittal MR image. **c**, Preoperative T-1 weighted after Gd-DTPA injection coronal MR image. **d**, Preoperative T-1 weighted after Gd-DTPA injection axial MR image showed a space-occupying lesion in the vertebral canal located on the middle to left side at the Th9 level.

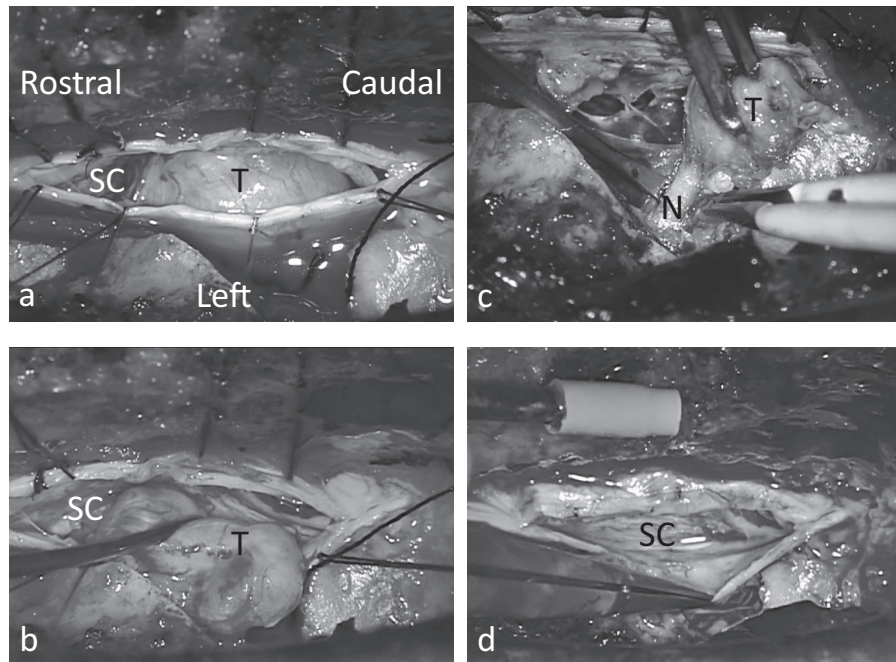


Fig. 3 Intraoperative microscope images. The spinal cord was strongly compressed by the tumor from the left side to the right and the ventral side. **a**, After opening the dura mater and arachnoid. **b**, Resection of tumor. **c**, Separation of outlet nerve root. **d**, Completion of tumor resection. SC, spinal cord; T, tumor; N, outlet nerve root.

lower extremity pain like sciatica. We checked brain MR image for excluding the possibility of intracranial lesion, lumbar MR image for lumbar canal and foraminal stenosis and pelvis MR image for pelvic lesion such as intra-pelvic space occupied lesion and piriformis syndrome. But nothing could be found for explaining his symptom except thoracic spinal tumor. Since the symptom of the patient showed refractory for conservative treatment, excision of thoracic dumbbell tumor was performed on patient compliance. We performed a left osteoplastic laminectomy of Th9 with excising the tumor under microscopy. The tumor was a dumbbell-shaped spinal tumor extending intradural and extradural spaces as shown in the preoperative images. The spinal cord was strongly compressed by the tumor from the left side to the right and the ventral side. The tumor was completely resected and considered to be a schwannoma originating from the Th9 dorsal root. The pathological diagnosis was schwannoma same as intraoperative findings. MR images after surgery showed no tumor recurrence and adequate decompression of the spinal cord for five years. Follow-up examination found that the symptom disappeared immediately after

the excision of the spinal tumor. He had returned to his previous activities of daily living and has been symptom free for five years.

III. Discussion

Generally, the symptom caused by spinal cord compression laterally at cervical or thoracic spine shows the motor deficit at the ipsilateral side of the lesion and sensory disturbance at the contralateral side of the lesion (Brown Sequard syndrome). A patient may also have the ipsilateral symptoms of radiculopathy at the same level of the lesion. Sensory disturbance caused by the compression of the sensory tract is usually noticed as hypalgesia or hyperalgesia rather than pain. And it is usually diffuse and fails to conform to a radicular or peripheral nerve distribution in a sensory dermatome.

Although the most common cause of buttock pain and lower extremity pain is lumbar nerve root irritation due to lumbar canal and/or foraminal stenosis, it can be elicited by any lesion originating anywhere along the course of any peripheral nerve root of the lower extremity or within the lumbosacral roots[1]. Buttock

Table 1 Clinical details of the 19 patients of buttock pain and/or lower extremity pain caused by cervical or thoracic cord compression

Case	Author	Reported year	Age [years] / gender	Symptom	Diagnosis	Side of the symptom	Surgery	Clinical outcome
1	Scott[2]	1956	52/F	lt. sciatica	Rt. Th2 meningioma	contralateral	laminectomy	poor
2	Scott[2]	1956	78/F	lt. foot pain	rt. C1 psammoma	contralateral	tumor excision	excellent
3	Scott[2]	1956	54/F	rt. sciatica, motor weakness	lt. Th4 psammoma	contralateral	tumor excision	good
4	Scott[2]	1956	65/F	rt. sciatica, rt./lt. motor weakness	rt. Th4 meningioma	N/A	tumor excision	excellent
5	Scott[2]	1956	59/F	rt./lt. sciatica, motor weakness	lt. Th2 neurofibroma	both	tumor excision	excellent
6	Scott[2]	1956	63/F	rt./lt. sciatica, motor weakness	rt. Th4 meningioma	both	tumor excision	excellent
7	Langfitt[3]	1967	63/F	rt. sciatica	lt. C4-5 meningioma	contralateral	tumor excision	excellent
8	Langfitt[3]	1967	47/M	rt./lt. sciatica	CSM	both	laminectomy	excellent
9	Langfitt[3]	1967	51/M	rt./lt. sciatica, motor weakness	CSM	both	laminectomy	excellent
10	Brambilla[4]	1984	47/F	sciatica	CSM	N/A	N/A	excellent
11	Mignucci[5]	1992	48/M	lt. sciatica	Th7-8 central disc herniation	N/A	disectomy	excellent
12	Ito[1]	1999	42/F	rt. sciatica	lt. C2-3 dumbbell-shaped spinal tumor	contralateral	tumor excision	excellent
13	Ito[1]	1999	41/M	rt. sciatica	CSM	N/A	laminoplasty	excellent
14	Yakushiji[6]	2010	55/M	lt. Sciatica	CSM	contralateral	laminoplasty	excellent
15	Yakushiji[6]	2010	49/M	rt. Sciatica	CSM	ipsilateral	laminoplasty	excellent
16	Cho[7]	2011	45/M	rt./lt. sciatica, motor weakness	Th6-7 disc herniation	both	disectomy	excellent
17	Cho[7]	2011	55/M	rt. sciatica, motor weakness	Th6-7 disc herniation	ipsilateral	disectomy	excellent
18	Mariniello[8]	2016	35/F	rt. sciatica, motor weakness	lt. Th11 meningioma	contralateral	tumor excision	excellent
19	This case	2020	72/M	rt. sciatica	lt. Th9 dumbbell-shaped spinal tumor (Schwannoma)	contralateral	tumor excision	excellent

CSM indicates cervical spondylotic myelopathy

and lower extremity pain like sciatica may also be referred from sacroiliac joint and hip joint. Piriformis syndrome is caused by sciatic nerve irritation between piriformis muscle and short-rotator muscle of the hip. A definite diagnosis of these diseases is often possible by confirming the patient's symptom and the image findings supporting the symptom. Lumbar canal stenosis can be confirmed by MR images with stenosis that matches the neurological symptom. A definitive diagnosis can be obtained by confirming the symptom reproducibility and therapeutic effect of selective nerve root block. Sacroiliac joint and hip joint disease is usually detected by symptom and images. Piriformis syndrome is often diagnosed by a symptom-inducing test such as Freiberg

test and Pace test. It is also useful to make a diagnosis by block injection into the piriformis itself.

Although rare, it may also be caused by lesions involving the spinal cord or thalamus[1]. There are some previous reports which presented the cases of buttock and lower extremity pain like sciatica in patients with cervical or thoracic cord compression (Table 1) [1-8]. The mechanism of buttock and lower extremity pain caused by cervical and thoracic compression still remains a matter of speculation. It probably arises from compression of spinothalamic tract or dorsal column. Yakushiji et al[6]. considered that pain at the ipsilateral side was caused by the compression of dorsal column and pain at the contralateral side was caused by the

compression of spinothalamic tract in his report. We considered that patient's symptom was caused by the compression of the left spinothalamic tract at thoracic spine level by the spinal tumor and the symptom was seen in his right side.

Our experience suggests that thoracic cord compression caused by such as spinal tumor should be suspected in patients who have buttock and lower extremity pain like sciatica. Even the lesion is located laterally at the opposite side of the pain, the symptom can occur at the contralateral side.

Contributors

T. Furuya, S. Maki, T. Inada, M. Ota, K. Kamiya and M. Koda contributed to patient management. All authors contributed writing of the report.

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Conflict of interest

S. Ohtori is a member of the Editorial Board of the Chiba Medical Journal. The other authors declare that they have no conflict of interest, either financial or non-financial, with the contents of this article.

Ethical approval

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

Data availability

All relevant data are available in the manuscript.

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