Calcification in a thoracic neurilemmoma: A case report

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Introduction

It is unusual for a spinal tumor to reveal shadows of calcification on X-rays, although this sometimes occurs with spinal meningioma. Spinal neurilemmoma is a benign tumor that often originates from a dorsal spinal nerve root and sometimes forms a dumbbell-shaped tumor. It is rare that these tumors show calcification, and we could find out only six such cases have been reported. Here we present a case of radiographically calcified thoracic spinal neurilemmoma.

I. Case report

A 50-year-old male had 10-year history of low back pain and numbness in both legs and a 5-year history of limping gait. He recently had experienced unstable gait, urinary disturbance and night cramp in his legs. In December 1999, he was admitted to our hospital. No significant medical history was noted.

On neurological examination, some loss of power in the anterior tibial muscles and hamstrings on the right side was noted along with sensory disturbance of hypesthesia in the trunk and both legs. Knee and ankle jerks were elevated bilaterally, and pathological reflexes were observed on both sides.

Plain roentgenograms showed increased interpedicular distance at the T7 level, decompressed right pedicle and a well-calci-fied lesion around the neural foramen (Fig 1). CT demonstrated a massive calcified lesion in the enlarged spinal canal and neural foramen of the T7 and T8 vertebral (Fig 2). MRI revealed a dumbbell-shaped tumor with a low signal intensity on T1-weighted image, and high signal intensity on T2-weighted image. The tumor was well enhanced by gadolinium on T1-weighted image, and the calcified region in the tumor was depicted as an area of no signal (Fig 3). The patient underwent surgical exploration

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Fig. 1  Plain radiographs showed increased interpedicular distance, decompressed pedicle of vertebral arch (A), and a well-calcified lesion around the neural foramen (A,B).

Fig. 2  CT demonstrated enlarged spinal canal and neural foramen containing a massive calcified lesion inside.

Fig. 3  Coronal T1-weighted MR image (A) reveals a dumbbell-shaped tumor with low intense signal, T2-weighted image (B) reveals a tumor with a hyper intense signal, and gadolinium contrast-enhanced image (C) reveals enhanced lesion.

and decompression with T7 and T8 laminectomy and right side facetectomy. It was revealed that the tumor was a dumbbell-shaped extradural tumor and its intracanal region was severely compressing the dura mater to the left. After cutting off at the involved 7th thoracic spinal nerve root, the tumor was completely removed. The size was 4x4x2.5cm, and it contained yellowish-white substance and many pieces of calci-
fied masses were observed after cutting its film. 

Histological findings (Fig 4): Hyaline degeneration was present in a broad part of the tumor, and there was significant calcification. The low cell-density area of Antoni B was found to a greater extent than the high cell-density area of Antoni A in the tumor tissue. The tumor cells were arranged fascicularly. Most of the nuclei were spindle or ovoid shaped, some of them had nuclear atypism and some of the nuclear bodies were unusual, though nucleus division was hardly observed. 

Hyaline degeneration was found at the matrix and perivascular region to various degrees. Slight hemorrhage was present, and partial hemosiderosis was observed, though inflammatory cell invasion was hardly observed. The tumor was diagnosed as ancient neurinoma (degenerated neurinoma) based on the above findings. 

Five years postoperatively, the patient has recovered gradually and he is now able to walk quickly; however, still has trouble with forced urination. No tumor recurrence or spinal deformity was observed.

II. Discussion

Calcifications of spinal tumors have been encountered in meningioma. Passerini, in a series of 66 spinal cord meningiomas, noted histologically demonstrable calcification in 41 (73%) patients, while radiographically demonstrable calcification was apparent in only 3 (5%) patients. In 9 cases of spinal neurofibromatosis, 2 cases had microscopic evidence of calcification; however, there was no radiographic evidence of calcification. Radiographically demonstrable calcification within spinal neurilemmomas is very rare, and I could found out only six cases reported (Table 1). Four of them occurred in the thoracic spine, two in the cervical spine and one in the lumbar spine. Five of them were intradural and extramedullary tumors.
Table 1  Comparison between six previously reported cases of calcified spinal neurilemmomas and our case.

<table>
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<th>author</th>
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F; Female, M; Male, Level C; Cervical, T; Thoracic, L; Lumbar
IDEM; intradural extramedullary, EM; extramedullary
N; No, Y; Yes

and the remaining were extramedullary tumors, and four of them were dumbbell-shaped tumors. Every case showed calcification both radiographically and histologically. Five cases reported after 1984 were evaluated by CT, and MRI was performed in three cases reported after 1989.

As the result of histological study, it was revealed that there were no remarkable histological differences in the tumor tissue surrounding the calcified area, as compared to the typical findings of neurilemmoma.

In terms of the mechanisms underlying the formation of calcification, Kubota et al. suggested that calcification in the blood vessels of the spinal cord gliomas may derive from matrix vesicles or matrix giant bodies, and that these may originate from degenerated cells within the blood vessel walls. Ultrastructural studies of various tumors have suggested that areas of calcifications originate from mitochondria and matrix vesicles. In the case presented here, no clues elucidating the mechanism of calcification were found from histological results, though the very long period of time from the onset of disease may be related to calcification in the tumor.

References cited