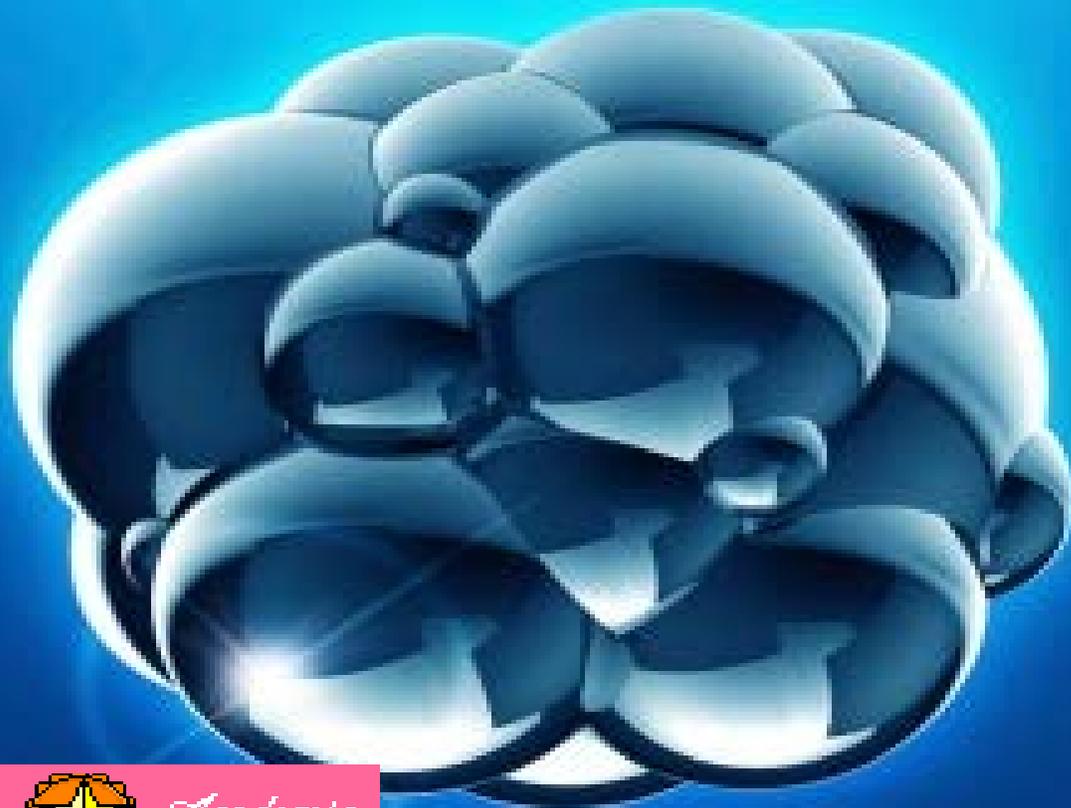


# Journal of Neuroscience and Behavioral Health

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# Journal of Neuroscience and Behavioral Health

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### Full Length Research Paper

**A case of contralateral lower extremity paresthesia involving a cervical schwannoma from the anterior nerve root** 9

Koshi Ninomiya, Koichi Iwatsuki, Yu-ichiro Ohnishi, Takashi Moriwaki and Toshiki Yoshimine

*Case Report*

## A case of contralateral lower extremity paresthesia involving a cervical schwannoma from the anterior nerve root

Koshi Ninomiya\*, Koichi Iwatsuki, Yu-ichiro Ohnishi, Takashi Moriwaki and Toshiki Yoshimine

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**A 56-year-old woman presented with right leg paresthesia for the previous year. Magnetic resonance imaging showed an intradural extramedullary tumor in the left anterolateral cervical spine. An operation was performed through the posterior approach. Intraoperative findings showed that the tumor was generated from the anterior nerve root. Total resection was performed. The histopathological diagnosis was schwannoma (World Health Organization grade 1). Immediately after the operation, the right leg paresthesia disappeared completely. Slight motor weakness of the left upper extremity appeared postoperatively but was restored two weeks later.**

**Key words:** Contralateral paresthesia, schwannoma, anterior nerve root.

### INTRODUCTION

Spinal schwannomas mostly arise from the intradural sensory root and grow dorsally toward the spinal cord. Occasionally, they arise from the motor root to grow ventrally toward the cord (Hori et al., 1984; Kim et al., 2005). We describe a rare case with an unusual clinical presentation involving a schwannoma that was generated from the anterior nerve root.

### CASE REPORT

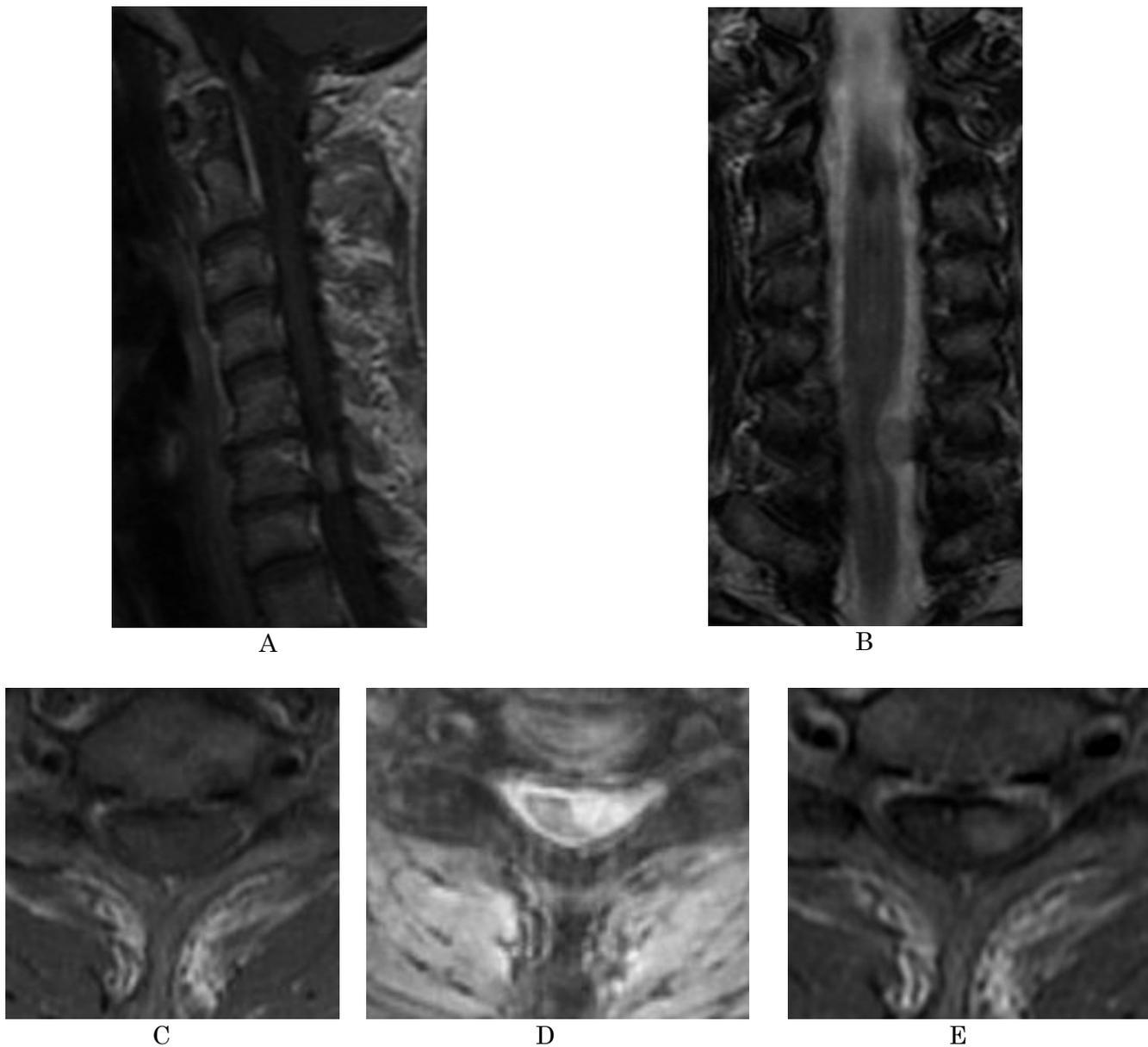
A 56-year-old woman was referred to our hospital with a diagnosis of cervical tumor. She had suffered from an

uncomfortable cold sensation on the anterolateral side of her lower right leg for one year. Light touch and position senses were normal in all other extremities and body. No motor weakness was observed in her extremities. Her Achilles and patella tendon reflexes were normal. Palpation of both dorsalispedis arteries was good. Cervical magnetic resonance imaging (MRI) showed a 10 × 6-mm-sized intradural extramedullary mass on the left anterolateral side at the C6/7 level, with low intensity on T1-weighted images, high intensity on T2-weighted images, and homogenous enhancement with gadolinium (Figure 1).

She had no other paresthesia-causative history, such

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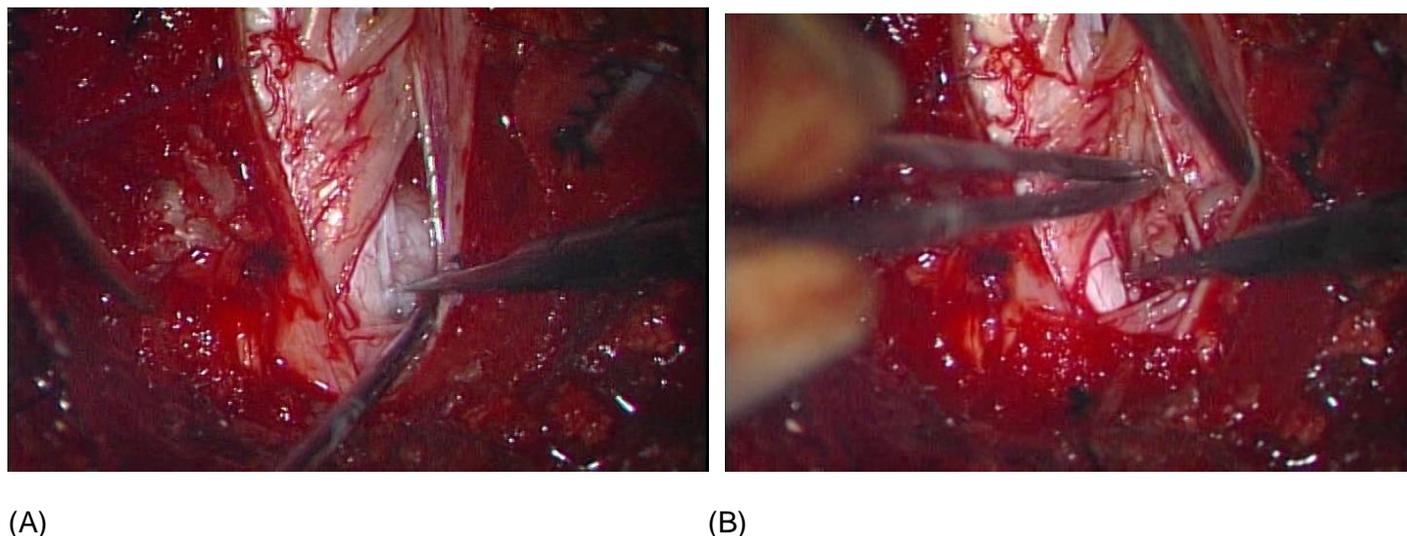
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**Figure 1.** Preoperative magnetic resonance imaging of the cervical spine showing a 10 × 6-mm-sized intradural extramedullary mass on the left anterolateral side of the C6/7 level (A-E) (A) Sagittal T1-weighted and contrast-enhanced image. (B) Coronal T1-weighted and contrast-enhanced image. (C) Axial T1-weighted image. (D) Axial T2-weighted image. (E) Axial T1-weighted and contrast-enhanced image.

as diabetes mellitus, stroke, or trauma. We suspected spinal cord compression by a cervical mass or an anterior nerve-derived tumor. After explaining her surgical risks of inducing motor or sensory deficits, she strongly desired surgical resection. Under general anesthesia, the patient was put in a prone position. Bilateral C6, C7, and T1 laminectomy were done. After opening the dura and

arachnoid, the tumor was found anterior to the dentate ligament. The tumor was obvious after the dentate ligament was cut. It was yellowish, elastic and hard, and we confirmed that it arose from the anterior C7 nerve root (Figure 2). It was well demarcated from the spinal cord, but it compressed the left anterolateral spinal cord. Internal decompression with ultrasonic surgical aspiration



**Figure 2.** Intraoperative microscopic imaging. (A) The tumor is seen anterior to the dentate ligament. (B) The tumor is seen to arise from the anterior nerve root.

was done. The proximal and distal nerve root was cauterized and cut. The nerve root end in the nerve foramen was well cauterized. The postoperative histopathological diagnosis was schwannoma (World Health Organization Grade 1). Immediately after the operation, the paresthesia in her right leg completely disappeared. However, grade-3 manual muscle test (MMT) weakness in the left triceps brachii and left extensor carpi radialis muscles appeared postoperatively. She was rehabilitated, and the symptoms were restored to grade-4 MMT three weeks later. Postoperative cervical MRI showed total tumor removal.

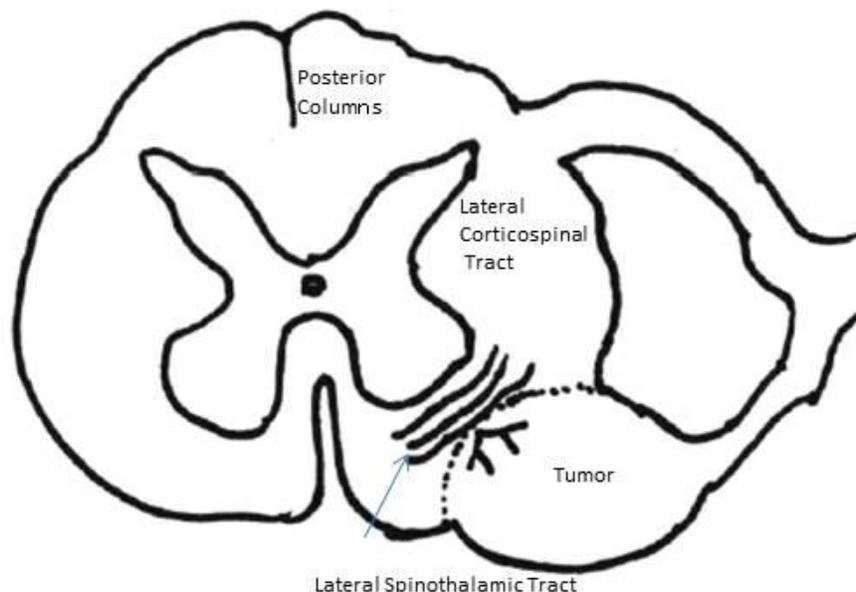
## DISCUSSION

Spinal schwannomas, which account for approximately 30% of primary spinal tumors (Seppala et al., 1995), originate predominantly from the spinal nerve sensory root, but occasionally from the motor root. They usually cause radiating pain by dorsal funiculus compression, or they induce numbness or abnormal sensations in the area of nerve innervation. Hori et al. (1984) have reported that 17.8% of their 45 spinal neuromas, including seven neurofibromas, originated from motor roots. Also, a thoracic subpial intramedullary schwannoma involving a ventral nerve root with Brown-Sequard syndrome has been reported (Kim et al., 2005). In that case, the tumor, located at anterior left side caused left leg motor weakness by involving motor nerve root, and dysthesia at the right side below T8 and T9 dermatome by compressing ipsilateral spinal thalamic tract. Our case is

not an intramedullary tumor case, but the mechanism for the abnormal contralateral sensation might be similar. We suggest that ipsilateral spinal thalamic tract compression by the extramedullary tumor caused the contralateral paresthesia (Figure 3). As the lateral side of the ipsilateral tract includes fiber from the leg in this level, the symptom may be localized at her leg, particularly. In this case, total tumor resection was done with no major complications. However, it is still controversial whether schwannomas should be totally resected. According to Kaneko et al. (2008) the degree of neurological deficits after transection of the involved nerve roots depends on the residual functions of the nerve roots that are involved in the schwannoma, the functions of adjacent nerve roots and the surgical procedure (Kaneko et al., 2006). Kim et al. (2005) have suggested that the spinal roots giving rise to schwannomas are frequently nonfunctional at the time of surgery, and the risks of causing disabling neurological deficits after sacrificing these roots are small (Kim et al., 1989). Compensatory mechanisms by neighboring nerve roots have been suggested by (Saiki et al., 2003), and surgical compound muscle action potential measurements are useful to analyze nerve root compensation. Although compensatory mechanisms were indicated in our case, we should have performed nerve monitoring to confirm it during surgery for determining total resection and the postoperative course.

## Conclusion

We presented a very rare case with unusual symptoms of



**Figure 3.** Schematic drawing of the possible mechanism of the contralateral paresthesia due to tumor compression of the lateral spinothalamic tract.

an anterior nerve root-derived schwannoma, which could have caused the contralateral lower extremity paresthesia.

### Conflict of interests

The authors have not declared any conflict of interests.

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