

## Ganglioneuroma of Spinal Nerve Root: A Rare Case Mimicking Herniated Lumbar Disc and Lumbar Radiculopathy

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### ABSTRACT

Ganglioneuromas are rare benign tumors arising from neuroepithelial cells. Even more rarely they involve lumbar spinal nerve roots. We report a 34-year-old male patient who presented with typical lumbar radiculopathy. He had low back pain radiating to the right lower leg with numbness. His MRI revealed a herniated disc at L5-S1 compressing the right nerve root. Surgery was planned for microdiscectomy and nerve root decompression. Right L5 hemilaminotomy was performed and the nerve root was identified. Surprisingly the nerve root was markedly inflamed and there was no obvious disc tissue herniation. Considering it to be a spinal nerve root tumor, the dura of the nerve root was opened and nerve root mass exposed. Subtotal resection was performed. Biopsy showed Ganglioneuroma. The main purpose of this article is to report such a rare case and also to review the literature.

**Key words:** Ganglioneuroma, Lumbar radiculopathy, Spinal nerve root, MRI

Ganglioneuromas are rare and benign lesions arising from neuroepithelial cells of sympathetic ganglions. They are neuroblastic tumors. Malignant neuroblastic tumors are called neuroblastomas, intermediate ones are called ganglioneuroblastomas and benign ones are called ganglioneuromas<sup>2</sup>.

Ganglioneuromas can affect any part of the sympathetic chain from the skull base to the pelvis. Most commonly they are found in the mediastinum in young adults. Ganglioneuroma occurring in the nerve root is very rare. Thus, we present a case of lumbar spinal nerve root ganglioneuroma presenting with typical lumbar radiculopathy. A brief literature review has also been presented along with this case report.

### CASE REPORT

A 34-year-old male patient had experienced low back pain radiating to right lower leg on and off for several years. His leg pain typically presented with lumbar radiculopathy along with numbness at L5/S1 dermatome. Pain was initially aggravated by walking and standing. Later, pain occurred even when in the lying and resting position.

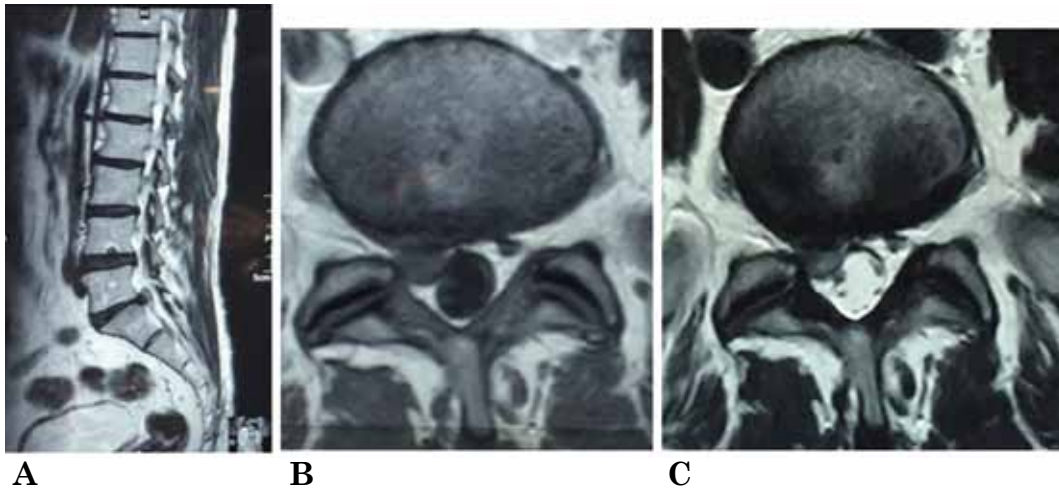
MRI of lumbo-sacral spine was performed which

showed hypointense lesions in both T1W and T2W sequences at L5-S1 on the right side. Nature of lesion, location and size suggested herniation of lumbar disc (Fig. 1). Contrast MRI was not performed.

Surgery was planned for microdiscectomy and decompression of nerve root. Informed consent was given for surgical management and also for academic purpose and future publication if needed. Right hemilaminotomy was done and the nerve root was exposed. Surprisingly there was no significant disc herniation. However, the nerve root was markedly swollen and congested. The size of the nerve root was larger than that of the dural sac (Fig. 2).

Suspecting spinal nerve root tumor, the dura was opened and the mass exposed. The mass was fatty in nature, diffusely infiltrating and intermingled with nerve filaments. Since total resection was not possible for which nerve had to be sacrificed, subtotal resection was performed and specimen sent for histopathological evaluation. The histopathological report revealed tissues composed of bundles of Schwann cells and large ganglionic cells. There were no atypia and no mitosis. Therefore, the histopathological report suggested ganglioneuroma (Fig. 3).

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**Fig. 1**

- A:** T2W MRI of lumbosacral spine, sagittal section showing lesion suggestive of herniation of lumbar disc at L5-S1  
**B:** T1W plain MRI, axial section at L5-S1 level showing a lesion at the right neural foramen suggestive of disc tissue or mass lesion  
**C:** T2W MRI, axial section at L5-S1 level showing a lesion at the right neural foramen suggestive of disc tissue or mass lesion

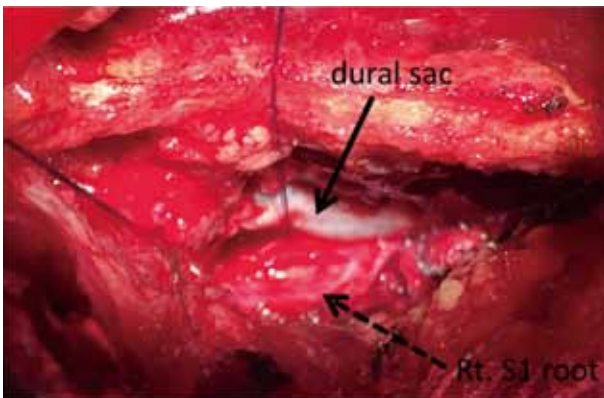
## DISCUSSION

Ganglioneuromas are peripheral neuroblastic tumors ranging from benign to malignant. Even though, more commonly, they are benign in nature, at times they can be malignant as well<sup>1)</sup>. They are more commonly found in young adults, and slightly more common in females<sup>2,5)</sup>. Our patient was a 34 years old male, thus the age of our case correlates with other literature.

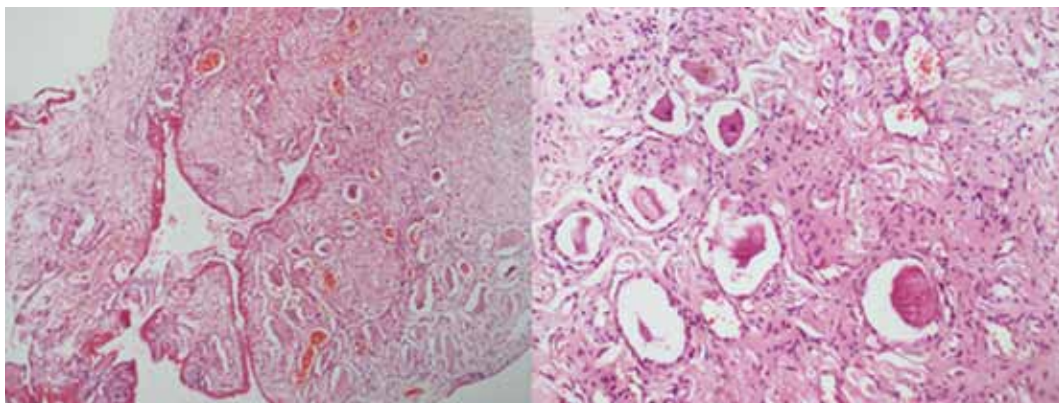
Posterior mediastinum and retroperitoneal spaces are the most common sites for these types of tumors. The pelvis is another common location of ganglioneuroma<sup>3)</sup>.

The lumbar spinal nerve root is a relatively less common location for such lesions, as observed in our case, and few such cases in cervical spine have been reported earlier<sup>2,6)</sup>.

Clinical symptoms and radiological findings may not give any clue to the diagnosis of such lesions. Spinal involvement by such lesions can lead to



**Fig. 2.** Intraoperative picture showing dural sack at L5-S1 level indicated by straight arrow and markedly swollen right S1 nerve root indicated by dotted arrow



**Fig. 3.** Histopathological picture of HE stain showing bundles of schwann cells and large ganglionic cells

paraparesis and radiculopathy<sup>4,5</sup>). Low back pain radiating to lower leg in our case, typical radiculopathy, gives hints of the involvement of lumbar nerve root though its cause can be variable, the most common cause in practice being herniation of lumbar disc (HLD). Therefore, such symptoms and radiological findings may be confusing and lead to the biased diagnosis of herniation of lumbar spine, as happened in our case.

Our case showed, in MRI, a small lesion at the level of L5-S1 on the right side looking exactly like herniated disc tissue considering the size and location of the lesion. Other such reported cases were bigger and different from herniated lumbar disc due to the size and location of the lesions. T1W MRI showed a iso to hypointense lesion which appeared hypointense in T2W MRI. Moreover, contrast MRI was not done in our case, otherwise it would have given some hints to differentiate it from disc tissue. There was no widening of neural foramen and no other signs of mass lesion, no dumbbell lesion etc. which further led to the more favorable diagnosis of herniation of the lumbar disc.

Intra-operative findings clearly revealed that it was a mass within the nerve root. There was a small piece of herniated lumbar disc which was removed; however, the nerve root was still very tight and grossly inflamed and swollen.

As a result, this case has two special features. The first is that ganglioneuroma in the lumbar spinal nerve root itself is a rare and reportable case. The typical presentation of herniated lumbar disc according to MRI finding and clinical picture is the second special feature of our case. Therefore, in this particular case, it was not possible to diagnose ganglioneuroma preoperatively. It was also difficult to say that the lesion was a mass inside the nerve root.

Other such reported cases presented with variable symptoms and MRI findings according to the location of the lesion. Few cases have been reported that presented with a similar picture to our case due to the involvement of nerve root<sup>6,7</sup>.

Histology revealed bundles of schwann cells, large ganglionic cells with moderate amounts of cytoplasm and round nuclei. There was no cellular atypia and mitosis.

Since the lesion was benign, no further active treatment was performed. A wait and watch policy was adopted. Moreover, radio and chemotherapy are also considered not to be effective in these lesions. However, local recurrence is expected in this particular case due to subtotal resection. The patient did not come for follow-up until 2 years after surgery, suggesting that he may be asymptomatic.

In conclusion, this case report once again proved that ganglioneuroma can occur in lumbar spinal nerve root and it is one of the differential diagnoses of herniated lumbar disc.

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