

# A Transverse Tri-Anastomotic Conjoined Nerve Root Discovered During a Lumbar Discectomy L5-S1

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## Abstract

Conjoined nerve root is an abnormality of nerve root. The incidence is between 0.3% and 30%. It arises during the fetal development of spine. The abnormality can be asymptomatic or produce lumbar back pain or radiculalgia. Sometimes it is diagnosed during spine surgery or in post mortem autopsy. Lack of diagnosis of conjoined nerve root may lead to surgical procedure failure and increase neurological injury. We present a case of a 52-year-old man who was operated for a lumbar discectomy with mixed L5 and S1 radiculopathy with a rare type of conjoined root nerve in shape of three anastomotic nerve roots.

**Keywords:** Conjoined nerve root; Lumbar back pain; Radiculopathy

## Introduction

Conjoined nerve root is an anomaly of nerve root [1]. The incidence is estimated about 6% [1, 2]. In this anomaly, the nerve root emerges at an abnormal level or from an anastomotic branch.

The most commonly reported level is L5-S1 [3]. Lack of diagnosis of this anomaly can lead to surgical procedure failure and increase neurological injury. Consequently, preoperative diagnosis of this anomaly is very important to avoid inadvertently damaging the nerve root. Sometimes it may manifest with low back pain or radiculalgia but it can be discovered incidentally during surgery. MRI is currently the best method available to diagnosis.

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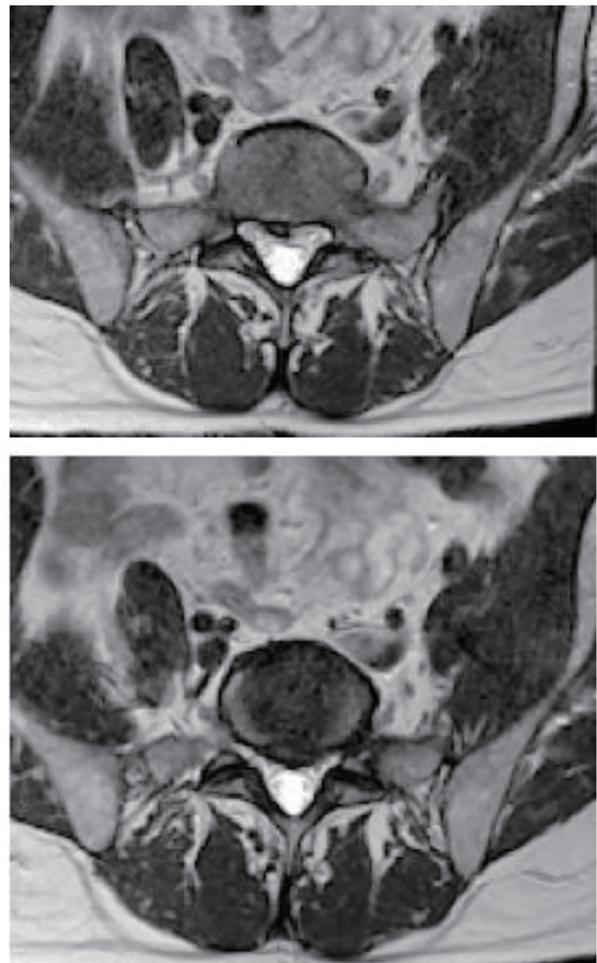
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## Case Report

We report a case of a 52-year-old male patient who presented a mixed L5 and S1 radiculopathy. He had pain for more than 8 months. Conventional therapy was ineffective. A peridural infiltration failed too.

The lumbar MRI demonstrated an L5-S1 disc protrusion (Figs. 1 and 2).



**Figure 1.** T2 axial MRI images show disc protrusion in L5-S1 level.



**Figure 2.** T2 sagittal MRI image shows disc protrusion in L5-S1 level.

He was operated by L5-S1 endoscopic discectomy. The L5 and S1 radiculopathies were relieved after surgery. The perioperative data showed an conjoined nerve root of L5 and S1.

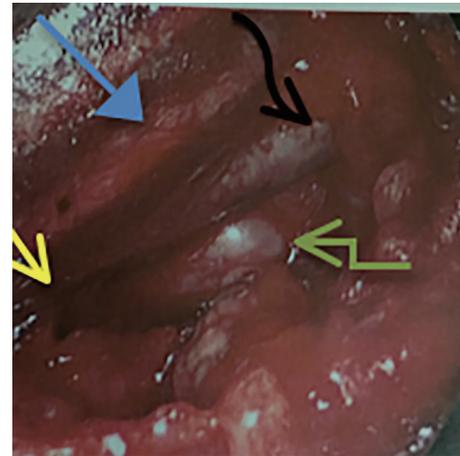
There were three anastomotic nerve roots in which adjacent nerves were connected in the form of a transverse anastomosis (Fig. 3). The patient was discharged the day after surgery. The clinical exam was normal the day of check-up and 6 weeks after surgery.

## Discussion

According to Artico et al, the incidence of nerve root anomalies is between 0.3% and 30% [4].

The anomalies arise during the fetal development of spine [5]. Cannon et al presented a first classification of nerve root anomalies [6] and Neidre and MacNab modified this classification of four types of abnormalities [2, 7]. The first type is the conjoined nerve root emerging from a common dural sheath, quitting the spinal canal through the intervertebrale foramen. The second type is described as two nerve roots exiting through the same intervertebral foramen. The third type consists of a group of anastomotic nerve roots in the form of a transverse or vertical anastomosis. The fourth type involves all mixed cases of the above types.

MRI is the best imaging for diagnosis of conjoined nerve root anomalies [2]. The coronal T2-weighted MR image is more sensible [8]. Bottcher et al proposed application of gadolinium contrast media in MRI for better identification [2]. More generally, patients present low back pain or radiculalgia [9]. They may show other symptoms like weakness, numbness and another kind of paresthesia [6, 7, 10]. Nerve root anomalies can be confused or may be contemporaneous with disc herniation. In these circumstances, the sciatic pain should be treated with particular caution, particularly if a surgery is indicated. It is, however, considered a last resort and used only when other methods have failed.



**Figure 3.** Perioperative image demonstrates tri-anastomotic transverse nerve roots. Yellow arrow shows emergence of the nerve roots from dural sheath. Blue, black and green arrows show three anastomotic nerve roots.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

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