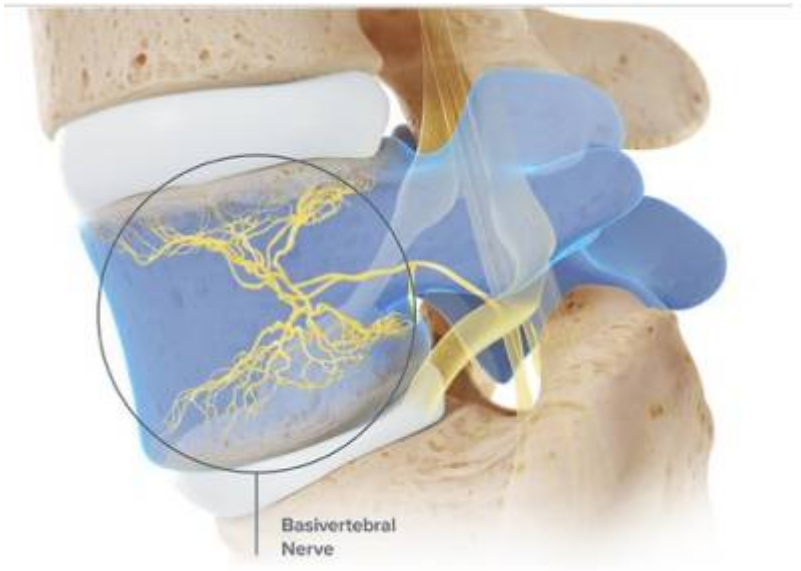
Basivertebral nerve

Relievant Intracept Procedure

The basivertebral nerve provides innervation to the trabecular bone of the vertebral body. The function of this nerve is not known.

The histology of 69 human vertebral bodies from 23 individuals was studied by hematoxylin and eosin staining using a technique that allowed the creation of complete, large histologic sections of individual vertebral bodies. Particular attention was directed toward the documentation of intraosseous nerves. The vertebral bodies were dissected free of soft tissue, and then sectioned using a diamond wafering saw into 3-mm sagittal segments. Sections were then decalcified and whole-mounted in paraffin blocks before tissue sectioning using a very-large-format microtome. One hundred thirty-eight tissue sections were prepared for evaluation. Neurovascular bundles and intraosseous nerves were routinely identified within human vertebral bone. Nerves were noted to enter the vertebral body via the centrally located posterior vascular foramen and were found to accompany the basivertebral vessels. Branches from these nerves coursed to both central and peripheral areas of the vertebral body. Nerves were also documented that entered the vertebral body by penetrating the anterior cortex to course into the marrow. Although previous studies have documented nerves within long bones, and others have described the histology of the intervertebral disc and associated soft tissues, previous literature that documents the innervation of the human vertebral body has been very sparse. The documentation of nerve tissue within normal human vertebrae further supports the proposed role of neuronal factors in the regulation of bone physiology. Furthermore, it is possible that such intraosseous nerves may play a role in the clinical problem of back pain [1].

The existence and distribution of these intraosseous nerves within the vertebral body were subsequently further detailed by Fras et al. in 2003 [2] and Bailey et al. in 2011 [3] , who also described the source of the intraosseous nerves as the basivertebral nerve (BVN).



The BVN enters the posterior vertebral body via the basivertebral foramen and arborizes near the center of the vertebral body, sending branches to innervate the superior and inferior endplates.

In 2003, Fras et al. [4] reported on the presence of Substance P within the BVN, concluding that these nerves have the potential for transmitting pain signals. Subsequently in 2011, Bailey et al. [5] showed that the basivertebral nerves are PGP 9.5-positive, establishing their role in pain transmission.

Lotz et al. [6] documented increased innervation, via the basivertebral nerve, of the endplates with damaged and degenerated endplates. Vertebral body pathology, such as degenerated endplates,

Case series

Fourteen patients with CLBP, greater than 6 months, unresponsive to at least 4 months of conservative care were enrolled. All patients were treated successfully following screening using MRI findings of Modic type I or II changes and positive confirmatory provocative discography to determine the affected levels. All patients underwent ablation of the basivertebral nerve (BVN) using 1414 nm Nd:YAG laser-assisted energy guided in a transforaminal epiduroscopic approach. Macnab's criteria and visual analog scale (VAS) score were collected retrospectively at each follow-up interval.

The mean age was 46 ± 9.95 years. The mean symptoms duration was 21.21 ± 21.87 months. The mean follow-up was 15.3 ± 2.67 months. The preoperative VAS score of 7.79 ± 0.97 changed to 1.92 ± 1.38, postoperatively ($P < 0.01$). As per Macnab's criteria, seven patients (50%) had excellent, six patients (42.85%) had good, and one patient (7.14%) had fair outcomes.

The transforaminal epiduroscopic basivertebral nerve laser ablation (TEBLA) appears to be a promising option in carefully selected patients with CLBP associated with the Modic changes [7].

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3) 5)
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