Anatomy, Causes, and Treatments of Dorsal Ramus Compression Syndromes: A Review

Grayson Baden

1Seattle Science Foundation, Seattle, WA, USA

http:thespinescholar.com
https://doi.org/10.26632/ss.5.2018.2.1

Key Words: Dorsal ramus syndrome, dorsal ramus, dorsal roots, back pain, referred pain

ABSTRACT

The dorsal ramus compression syndromes, often observed in the cervical and lumbar spine, can be caused by a variety of factors, with surgery and strain (and subsequent denervation) being common. They are characterized by pain at the site of the affected ramus, motor weakness, tremors, and referred pain within the dermatome of the vertebra. Treatments include physical therapy to strengthen back muscles, injection of anesthetic or anti-inflammatory medication or (in extreme cases) dorsal rhizotomy. The Spine Scholar 1:15-16, 2018

INTRODUCTION

Up to 31 million Americans experience back pain at a given time (Jensen et al., 1994). Back pain of various severities, symptoms, and etiologies may arise, and making a correct diagnosis while giving reasonable and effective treatment options requires vast knowledge of possible causes. The dorsal ramus syndromes (DRS) occur when the dorsal ramus (Fig. 1) of a vertebra becomes inflamed or pinched, leading to discomfort at the joint, motor weakness, tremors, and referred pain elsewhere in the body. The dorsal roots of the cervical region are also three times as thick as the ventral roots, making them much more likely to become entrapped.

Fig. 1: Cadaveric view of a dorsal ramus
Symptoms

The locations of these symptoms depend on which section of spine the ramus is being affected: for cervical dorsal ramus syndrome, referred pain may be in the form of headaches and discomfort in the shoulders, neck, or arms, while lumbar DRS could present with pain in the hips, gluteal region, and legs. The irritation of the medial branch of the dorsal ramus occurs because it winds and twists around the surrounding bone and muscles, making it more likely to become entrapped. Causes of DRS can include hypermobility of the vertebrae, causing pinching or inflammation or surgery causing denervation and back muscle weakness (Kim et al., 2014). Surgical procedures (including those involving a dorsomedian approach to the spine) can cause denervation as the muscles are retracted. Cauterizing nearby vessels (e.g., dorsal branches of segmental arteries) can also damage branches of the dorsal rami (Boelderl et al., 2002).

Treatments

Treatments included segmental anesthesia and back muscle exercises, injection of anesthetic and anti-inflammatory drugs, known as a "lumbar dorsal ramus block," (Kim et al., 2007) and rhizotomy of the dorsal root at the affected level (Mcculloch et al., 1976). While some recipients of dorsal rhizotomy have relief of pain, success is not certain for all - some have only temporary relief, while some patients have no benefit from the procedure (Kim et al., 2007).

CONCLUSION

DRS arising as a result of inflammation and pinching of the medial branches of the dorsal ramus are identified by localized pain at the ramus, muscle weakness or pain within the dermatome of the affected level. Trauma, hypermobility of the vertebrae, and retraction of back muscle during surgery can all cause DRS, and its treatments vary in invasiveness and effectiveness. Physical therapy to strengthen the back muscles is least invasive and has favorable prospects for pain management. Injection of anesthesia and/or anti-inflammatory medications at the affected vertebra can also achieve success in many patients. The most invasive and sometimes least effective treatment is rhizotomy of the dorsal root.

REFERENCES