Endoscopic Rhizotomy of the Dorsal Ramus with its Lateral and Medial Branch for Chronic Discogenic/Axial Back Pain

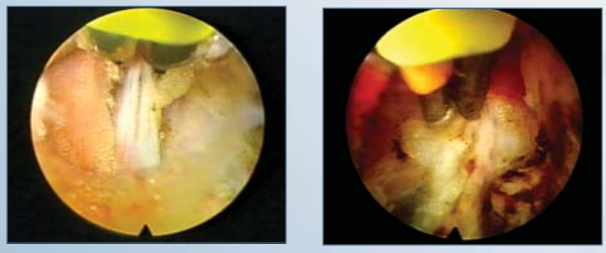
Anthony Yeung, MD, Arizona, U.S.A.

Purpose

For the past 20 years, radiofrequency lesioning of the medial branch of the dorsal ramus to the facet joint has been the standard approach specifically for facet joint mediated axial back pain. Little is known about the role of the dorsal ramus, which gives rise to the medial and lateral branch.

Materials and Method

A prospective non-randomized pilot feasibility study was initiated to assess the effect of endoscopic radiofrequency lesioning of the dorsal ramus and its lateral and medial branch on relieving chronic back pain.



Lateral Branch Cephalad to Transverse Process/Follow Lateral *Branch to Dorsal Ramus*

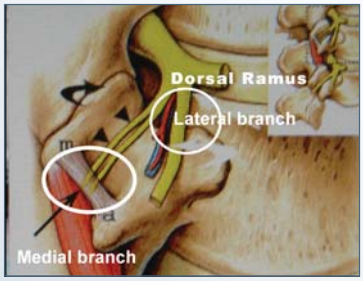
Patients who had evidence of degenerative disc disease, lumbar spondylosis, and facet arthrosis on MRI who had predominant axial back pain and probable etiologic irritation of the dorsal ramus were considered for treatment. Patients who had at least 50% improvement of their back pain with facet medial branch blocks were offered this endoscopic procedure. A modification of Richard Wolf's 3.1mm YESS Vertebris Working Channel Endoscope and Cannula was designed specifically for facet rhizotomy. A specially designed elliquence radiofrequency bipolar electrode was also developed as the surgical instrument to be utilized. Fifty consecutive patients were enrolled in the study from July 2006 through June 2007. Follow-up 1-2 years.

Results

48/50 had positive benefit from the rhizotomy at least equal to but mostly better than the pain relief they obtained with their medial branch facet injection. There was 100% patient satisfaction. 10/50 have regressed but non were worse. Some patients claimed to have 100% relief of their pre-operative back pain. Pre-and post-op Vas decreased from 6.2 – 2.5 Oswesty scores decreased from 48 – 28

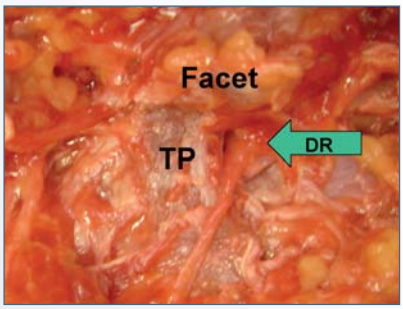
Discussion

The literature on the patho-anatomy and Patho-physiology of chronic low back pain has focused mostly on discogenic pain, felt to be responsible for 39% of LBP by discography. Treatment of axial back pain has been virtually ignored by spine surgeons except when associated with severe deformity or instability. The basic science literature has identified the medial branch of dorsal ramus as the nerve supply to the facet joint.



Micro anatomy of the Dorsal Ramus

The Dorsal Ramus and lateral branch has been virtually ignored, even though it is known to be responsible for the innervation to the soft tissues lateral to the facet joint line. Zhou reported on dorsal ramus syndrome as a cause of involuntary muscle spasm originating most commonly from L1 and L2. At this level, anatomic dissections show the dorsal ramus sending branches two to three levels lower, with pain is referred to the low back up to two segments lower.



Cadaver Dissection of the Lateral Branch

Zhou reported excellent results for relieving back pain and muscle spasm with cryo lesioning of the dorsal ramus at these upper lumbar levels. This study combines the time tested medial branch rhizotomy with the addition of dorsal ramus lesioning for the treatment of non-discogenic low back pain.

Conclusions

Most clinical presentations of non-discogenic low back pain likely involve the dorsal ramus. For chronic low back pain, ablation of the dorsal ramus at L1 and L2 may relieve back pain two to three segments below. Dorsal ramus and medial branch injections may identify a source of low back pain that is amenable to endoscopic targeted lesioning that appears to be more effective than the radiofrequency lesioning currently utilized for facet pain. Compression of the spinal dorsal ramus is one cause of low back pain that is readily treated by this new technique. Clinical studies should be done to differentiate dorsal ramus mediated pain from facet and SI joint pain.

Keywords

Dorsal Ramus, lateral branch of the dorsal ramus, medial branch of the dorsal ramus, endoscopic rhizotomy, elliquence radiofrequency bipolar electrode