Radiofrequency neurotomy

Interruption of spinal nerve roots by coagulation with radiofrequency waves.

Radiofrequency (RF) rhizotomy or neurotomy is a therapeutic procedure designed to decrease and/or eliminate nerve pain symptoms that have not responded to more conservative pain treatments. The procedure involves destroying the nerves causing the pain with highly localized heat generated with radiofrequency. By destroying these nerves, pain signals are prevented from being transmitted from the spine to the brain. A successful procedure reduces pain without reducing nerve function.

Indications

Percutaneous stereotactic radiofrequency rhizotomy

See Radiofrequency trigeminal rhizotomy.

Radiofrequency Neurotomy for Chronic Neck Pain.

History

The technique of lumbar medial branch radiofrequency neurotomy for facet joint pain has an intriguing history involving a diverse timeline of medical specialists. This paper aims to chart the pathway that led to its invention and the series of modifications and refinements that have led to modern practice. The story begins with the treatment of World War I soldiers by Nesfield, who used scalpels to cut “trapped” nerves. Inspired by Nesfield's treatment, Rees developed the “percutaneous rhizolysis” technique in 1960. Shealy was the first to use radiofrequency electrodes for denervation of the facet joints, introducing his technique in 1971. Several radiofrequency electrode developments came about from collaborations with Cosman medical device entrepreneurs during the 1970s, including the Shealy Rhizolysis Kit, the Ray Rhizotomy Electrode, and the Sluijter-Mehta Kit. Subsequent dissections of Rees' technique and modification of Shealy's procedure by Bogduk saw the development of “percutaneous lumbar medial branch neurotomy” in 1980 by Bogduk and Long. Bogduk continued to contribute significantly to validation, refinement and acceptance of the technique. In 1998, the technique of pulsed radiofrequency was invented by Sluijter, Cosman, Rittman and van Kleef. Subsequent innovations have consisted of cooled radiofrequency neurotomy, multi-tined cannulae, endoscopic systems, and alternative denervation targets, such as the facet joint capsule. As we pass the first 100 years of the story, we believe there are more chapters to be written on this fascinating subject [1)]

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Russo M, Santarelli D, Wright R, Gilligan C. A History of the Development of Radiofrequency Neurotomy. J Pain Res. 2021 Dec 24;14:3897-3907. doi: 10.2147/JPR.S334862. PMID: 34992451; PMCID: PMC8714970.