World Neurosurg. 2018 Mar 9. pii: S1878-8750(18)30496-0. doi: 10.1016/j.wneu.2018.03.026. [Epub ahead of print]

Piezoelectric Surgery for Dorsal Spine: A technical note.

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Abstract

BACKGROUND: Laminoplasty and laminectomy are two common surgical procedures utilized in approaching degenerative and neoplastic disease of the spinal canal. Routinely adopted instruments, such as Kerrison rongeur or high-speed drill (HSD), entail some potentially serious complications such as dura injuring and thermal and mechanical damage to neurovascular structures. We have adopted piezoelectric bone surgery, which permits a selective cut of mineralized tissues, to perform posterior procedures on the thoracic spine, where the relationship between bone and the spinal cord are critical.

OBJECTIVE: To evaluate the use of piezoelectric surgery for performing dorsal spine laminectomy and laminoplasty.

METHODS: Mectron piezosurgery device is an instrument developed for cutting bone with microvibrations that are created by the piezoelectric effect. This instrument allows a safe and precise bone cut, and it is characterized by no heat generation, thus avoiding thermal injury to bone and soft tissues. We have adopted this device to perform eight laminoplasty for tumors of the dorsal spine and two laminectomies for thoracic spinal stenosis, for a total of ten patients.

RESULTS: Across all surgeries there were no procedure-related intraoperative complications, such as dura injuring or damage to neural structures.

CONCLUSION: The piezoelectric device showed excellent results in terms of safety and precise bone cutting properties when performing posterior surgical procedures in the dorsal spine, where thermal injury produced by the conventionally used drill may damage the spinal cord, closer to bony elements.

KEYWORDS: Dorsal spine; Laminectomy; Laminoplasty; Mectron; Piezoelectric surgery; Thoracic spinal stenosis

PMID: 29530686 DOI: 10.1016/j.wneu.2018.03.026

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