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Piezoelectric Surgery for Dorsal Spine.

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Author information

Abstract

BACKGROUND: Laminoplasty and laminectomy are 2 common surgical procedures used in treating degenerative and neoplastic diseases of the spinal canal. Routinely used instruments, such as the Kerrison rongeur and high-speed drill, can result in potentially serious complications, such as dural injury and thermal and mechanical damage to neurovascular structures. We 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 is critical. The aim of this article was to evaluate the use of piezoelectric surgery for performing dorsal spine laminectomy and laminoplasty.

METHODS: The Mectron piezosurgery device was 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 used this device to perform 8 laminoplasties for tumors of the dorsal spine and 2 laminectomies for thoracic spinal stenosis in 10 patients.

RESULTS: There were no procedure-related intraoperative complications, such as dural injury or damage to neural structures.

CONCLUSIONS: 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.

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

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