Vertebral body impactor for posterior lateral decompression of thoracic and lumbar fractures

Technical note

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A hand-held impactor is described that allows secure impaction of retropulsed vertebral body bone fragments in burst fractures of the thoracic or lumbar spine.

KEY WORDS • spinal injury • spine fracture • bone fracture • instrumentation

POSTERIOR lateral decompression and fusion is an accepted treatment for burst fractures of the thoracic and lumbar spine. However, decompression of vertebral body bone fragments retropulsed into the spinal canal remains a challenge. Various instruments have been described for impaction of the retropulsed bone, including the straight curette, down-biting curette, a dental instrument, a Freer elevator, Cloward foramen dissector, and a tamper. In the authors’ experience, the dental instrument is insecure, the reversed-angle curette does not have sufficient surface area, and the Freer elevator and straight curette do not have sufficient angle for adequate decompression. The vertebral body impactor was designed to overcome these limitations.

Description of Instrument and Technique

The instrument is made of one piece of stainless steel, and is 22.5 cm long with a handle diameter of 2.1 cm (Fig. 1 left). The handle has a groove at its base for the surgeon’s thumb. The foot plate, angled 30° from the shaft, is 6 mm wide and 2.5 mm high. Two instruments are available for use, with a 12-mm or a 15-mm long foot plate. The teeth at the base of the foot plate are angled forward to prevent slippage of the instrument medially with impingement on the dural contents (Fig. 1 right).

Following either hemilaminectomy or laminectomy, the core of the pedicle on the side of maximum dural compression is removed with a high-speed drill leaving a rim of bone to protect the dura and nerve root. The remaining rim is then fractured laterally with a straight curette and removed. The dental instrument is used to identify the retropulsed fragment which is undermined by drilling into the body with a high-speed drill. Following initial decompression of any sharp bone edges with the reversed-angle curette, the foot plate of the vertebral impactor is gently rotated into the spinal canal and,
taking a firm grip on the impactor with both hands, the surgeon pushes the fragment anteriorly into the cavity created in the vertebral body. In fractures without major retropulsion, the fragment may be impacted without undermining.

Comment

This impactor has been used at our institution in the management of thoracic and lumbar fractures for the past 2 years. Restitution of the spinal canal has been satisfactory, as assessed intraoperatively with the dental instrument and by postoperative tomography. No worsening of the patient’s neurological condition has occurred. The instrument is not recommended for use without first performing hemilaminectomy and resection of the pedicle on the side of maximum canal compression. Somatosensory or motor evoked potential monitoring during decompression is advised.

References


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