Anterior Cervical Foraminotomy by Total Ultrasonic Resection of the Uncinate Process

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Introduction

Symptomatic cervical foraminal stenosis caused by hypertrophy of the uncovertebral and facet joints is often accompanied by central canal stenosis. Posterior cervical foraminotomy does not allow resection of the centrally-located disc-osteophyte complex. Anterior cervical foraminotomy during anterior discectomy is often limited to resection of the medial aspect of the uncinate process for fear of injury to the nearby vertebral artery and may not sufficiently decompress the neural foramen.

An ultrasonic bone dissector (BoneScalpel) with a non-rotating tip can be used to safely approach the vertebral artery. A novel method for total resection of the uncinate process to completely unroof the neural foramen and expose the vertebral artery is presented.

Methods

22 patients with severe symptomatic osseous foraminal stenosis in addition to central disc herniations and spondylosis underwent anterior cervical discectomy and fusion accompanied by complete uncinectomy. An ultrasonic bone dissector equipped with a micro-shaver tip was used to cut the base of the uncinate process from a medial to lateral orientation until the vertebral artery canal was reached. The residual uncinate process was then disarticulated from the uncovertebral joint and elevated away from the vertebral artery and the nerve root.

Surgical Steps

1. A standard anterior cervical discectomy is carried out.
2. The longus coli attachements are resected or retracted to expose the lateral rim of superior endplate.
3. A Penfield 4 instrument is placed lateral to the uncinate process in the vertebral artery canal.
4. The uncinate process is amputated at its base, using a BoneScalpel micro-shaver tip.
5. The residual uncinate process is folded away from the vertebral artery into the disc space.
6. The ligamentous attachments of the unco-vertebral joint are cut.
7. The uncinate process is removed.
8. The soft tissue (lateral extension of PLL) over the nerve root is incised to expose the nerve root.
9. Fusion (with a wide bone graft) and plating are performed in standard fashion.

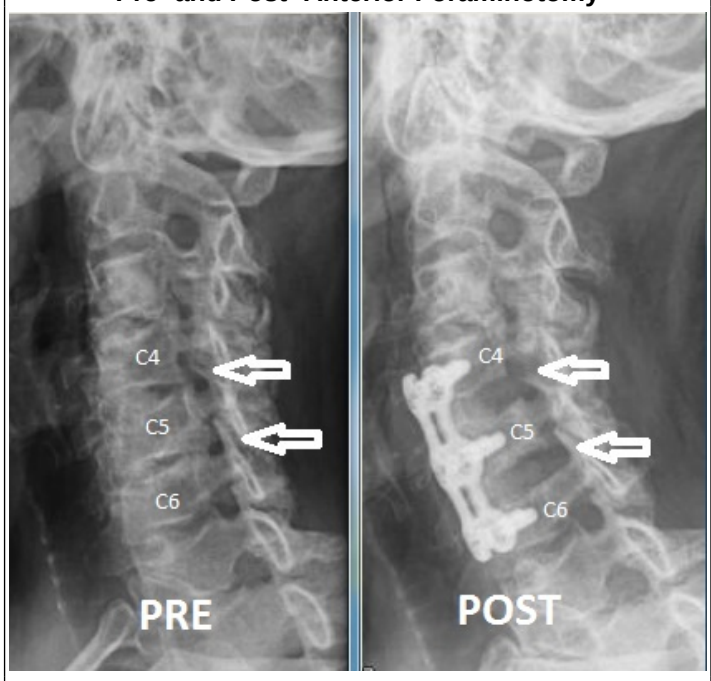
Surgical Video :

View video at: **http://bit.ly/1ec0Bpl**

Results

In all cases it was possible to easily remove the uncinate process as planned. No injury to the vertebral artery occurred in any of the cases. Good relief of cervical radicular symptoms was achieved in all cases. Post-operative computed tomography and oblique radiographs confirmed complete decompression of the neural foramen.

Pre- and Post- Anterior Foraminotomy



Oblique Xrays reveal good decompression of C4-5 and C5 -6 neural foramina after ultrasonic total uncinectomy

Conclusions

Complete resection of the uncinate process can be achieved in a safe and expeditious manner using an ultrasonic bone dissector, thus providing better decompression of the nerve root via an anterior approach.