



# Endoscopic Anterior Cervical Discectomy/Foraminoplasty with Intraoperative Neurophysiological Monitoring (IOM)

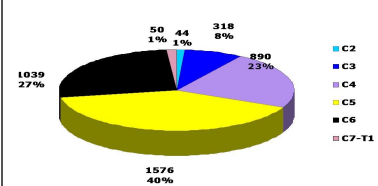
John C. Chiu MD  
Neurosurgery Department  
California Spine Institute  
Thousand Oaks, California, 91320 USA



## Introduction

Outpatient anterior endoscopic microdecompressive cervical discectomy and foraminal decompression (foraminoplasty), by utilizing GPS (grid positional system), can treat herniated cervical discs and cervical foraminal stenosis efficaciously and successfully.

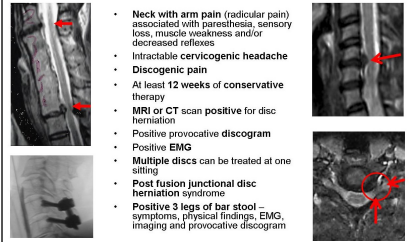
### Demographics of Endoscopic Anterior Cervical Discectomy (3917)



## Methods

Since 1995, 2169 patients (3917 Discs), who failed at least 12 weeks of conservative care were treated. Levels were C2 to C7, inclusive. All patients demonstrated unilateral radicular pain of a specific dermatome, single level or multiple levels, confirmed with EMG/NCV. MRI or CT scans demonstrated the herniated cervical disc.

### Surgical Indications



The surgical technique of anterior endoscopic microdecompressive cervical discectomy foraminal decompression (foraminoplasty) and laser thermodiskoplasty (non-ablative lower Holmium laser energy for disc shrinkage and tightening) are described. The surgical approach guided and facilitated with GPS is explained.

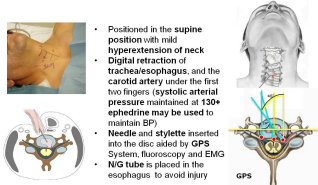
### ANESTHESIA and Intra-operative neurophysiological monitoring (IOM)

- Local anesthesia combined with IV conscious sedation with surface EEG monitoring optimize anesthesia and reduce drug requirement
- The obvious challenge of MISS is limited visualization and exposure of the relevant anatomy and direct visualization of the nerve
- Continuous intra-operative EMG neurophysiological monitoring in a digital operating room (DOR) prevents undue neural trauma
- IOM of neural structure, direct visualization with fluoroscopy and endoscopy creates safer endoscopic MISS procedures

### IOM - Introduction

- Trend of spinal surgery is toward less or minimally invasive spine surgery (MISS)
- MISS aims at being less traumatic, with less morbidity and improved surgical outcome
- The obvious challenge of MISS is limited visualization and exposure of the relevant anatomy in spite of fluoroscopy and endoscopy to work with, and potentially placing the relevant neural structures at increased risk of trauma
- INTRAOPERATIVE NEUROPHYSIOLOGICAL MONITORING (IOM) of neural structure, direct visualization with fluoroscopy and endoscopy creates safer endoscopic MISS procedures
- Spontaneous EMG monitoring, at times SSEP and MEP can provide the surgeon with useful feedback to avoid neural trauma during MISS
- Intra-operative surface EEG neurophysiological monitoring optimizes the anesthesia for MISS

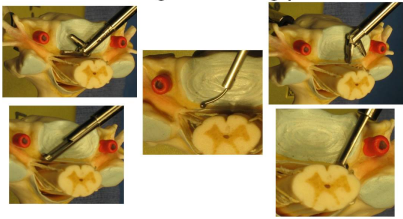
### Patient Positioning - surgical portal of entry. Surgical Technique for needle and stylette placement into the disc with GPS



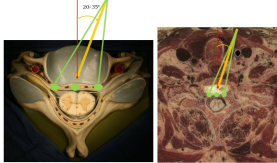
### Endoscopic surgical instruments



### Endoscopic micro flexible forceps, bone rongeur and navigable dissecting probe



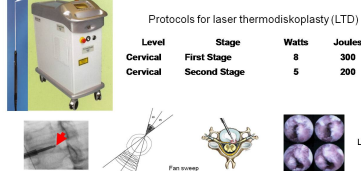
### Mechanical decompression with GPS guidance for foraminoplasty for osteophytes/stenosis



### Endoscopic/fluoroscopic views to provide safe and precise application of aggressive grasper forceps, drill, curette, discotome, and bony ronguer for microdecompression



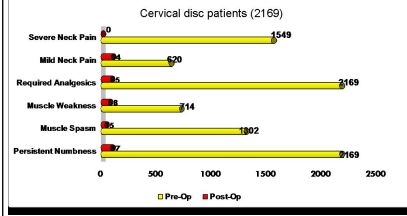
### Holmium YAG laser - photo thermal effect on the disc - shrinking and tightening



## Results

For single level, 94% had good to excellent symptomatic relief and spinal motion preservation. 4.5% of patients had some persistent neck and upper extremity residual but diminished pain associated with parasthesia, after surgery. Average time to return to work was ten to fourteen days. There were no intraoperative complications. Postoperatively, one with transient Horner's syndrome and one transient hoarseness voice were noted.

### Surgical Outcome: (symptomatic improvements)



## Conclusions

Anterior endoscopic microdecompressive cervical discectomy and foraminal decompression with mechanical decompression and lower level non-ablative Holmium laser for disc shrinking and tightening effect (laser thermodiskoplasty) with GPS has proven to be safe, less traumatic, easier, and efficacious with significant economic savings. It preserves spinal motion. It is an effective alternative or replacement for conventional open cervical spinal surgery for disc discectomy.

### Case Illustration

- 35 year old male professional musician with increasing intractable neck and upper extremity pain and numbness of fingers, unable to perform
- AECM and left C5-6 foraminal decompressive discectomy and foraminoplasty gave immediate relief of all symptoms



Pre operative MRI scans - Large foraminal herniated C5-6 disc compressing C6 nerve root

## References

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## Learning Objectives

- By the conclusion of this session, participants should be able to describe outpatient anterior endoscopic microdecompressive discectomy and foraminal decompression
- To discuss the surgical technique and approach with GPS system (Grid positional system)
- To identify the effective technique of anterior endoscopic cervical spinal surgery facilitated with GPS System.