Clinical Outcomes of Microendoscopic Foraminotomy and Decompression in the Cervical Spine

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Introduction

Cervical microendoscopic foraminotomy (CMEF) and cervical microendoscopic discectomy (CMED) are two minimally invasive procedures used in modern spinal practice to treat foraminal stenosis and disk herniation in the cervical spine. The use of these techniques may help to limit direct approach related morbidity and improve long-term outcomes.

Methods

A total of 38 patients were included in this study, with a mean follow-up of 24.47 ±12.84 months. Patients were followed prospectively with questionnaires consisting of a visual analog scale for the neck (VASN) and arm (VASA), and a neck disability index (NDI) form. Operative time, estimated blood loss, and hospitalization stay were also collected. Data was analyzed using Microsoft office excel 2007.

Patient demographics

Variable	Value
Number of patients	38
Mean age. (range)	49.54 ±9.66 (30-70 years)
Average follow-up (range)	24.47 ±12.84 (8-61 months)
Male	25 (65.79%)
Female	13 (34.21 %)
Side of Procedure	
Left	19 (50.00 %)
Right	17 (44.74 %)
Bilateral	2 (5.26 %)
History of Surgery	
Yes	5 (13.16%)
No	33 (86.84%)
Number of Levels	
1 Level	23 (60.53 %)
2 Level	14 (36.84 %)
3 Level	1 (2.63 %)

Number of patients operated on at indicated levels

Operative Level(s)	Number of Patients
C4-5	1
C4-5, C5-6	3
C5-6	4
C5-6, C6-7	11
C5-6, C6-7, C7-T1	1
C6-7	15
C7-T1	3

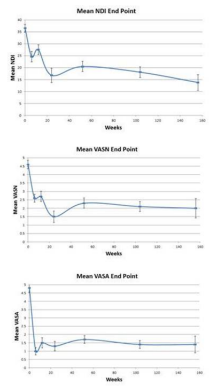
Results

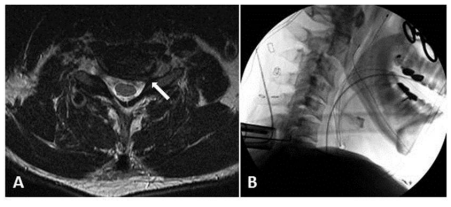
The mean 1 year follow-up scores all showed statistically significant improvements: NDI (p = 0.0019), VASN (p = 0.0017), VASA (p = < .0001). Similar results were seen at 2 year follow-up: NDI (p = 0.0011), VASN (p = 0.0022), VASA (p = < .0001); and at 3-6 year follow-up: NDI (p = 0.0015), VASN (p = 0.0200), VASA (p = 0.0034). The average operation time, hospitalization stay, and estimated blood loss were 154.27 ±26.79 minutes, 21.22 ±14.23 hours, and 27.92 cc respectively. There were no statistically significant differences when patients were compared by age (over 50 vs. under 50), operative level (above C6 vs. below C6), or sex. There was one complication (2.63%) consisting of a duratomy which required no further intervention. In addition, one patient (2.63%) required an ACDF 56 months post-operatively due to continued radiculopathy, presumably from mild spinal instability at the previous operative level.

End Point	Baseline Means	1 Year Means	2 Year Means	3-6 Year Means
NDI	36.5 ± 3.29	20.5 ±4.29 [a]	18.1 ±4.55 [a]	13.8 ±6.55 [a]
VASN	4.6 ±0.49	2.3 ±0.52 [a]	2.1 ±0.60 [a]	2.0 ±1.17 [a]
VASA	4.8 ±0.53	1.7 ±0.48 [a]	1.4 ±0.47 [a]	1.3 ±1.01 [a]

a: P-value <0.05 (compared to baseline)

Long-term trends in outcome scores





Example case showing a 57 year-old with persistent left C7 motor and sensory radiculopathy with proximal foramina stenosis secondary to a C6/C7 disk herniation

Conclusions

Posterior CMEF and CMED are safe and effective procedures for minimally invasive decompression in the cervical spine. Their continued implementation provide an important alternative to more traditional techniques.

Learning Objectives

1. To understand the efficacy of posterior approaches for laminoforamintomy in the cervical spine.

2. To evaluate non-fusion options for cervical degenerative disease with radiculopathy.

References

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