EVALUATION OF POSTERIOR MICROSCOPIC CERVICAL FORAMINOTOMY IN MANAGEMENT OF CERVICAL DISC DISEASE

Thesis

Submitted for Partial Fulfillment of
The Doctorate Degree (M.D) in
Neurosurgery

By

Ahmed M. Allam
(M.B, B.CH, M.Sc.)

Supervised by

Prof. Dr. Ismael Ibrahim
Professor of Neurosurgery,
Faculty of Medicine, Cairo University

Prof. Dr. Nasser El-Ghandour
Professor of Neurosurgery,
Faculty of Medicine, Cairo University

Prof. Dr. Wael El-Mahdy
Professor of Neurosurgery,
Faculty of Medicine, Cairo University,

Dr. Ahmed Hegazy
Assistant Professor of Neurosurgery,
Faculty of Medicine, Cairo University

Faculty of Medicine
Cairo University
2012

بسم الله الرحمن الرحيم

ACKNOWLEDGMENTS

*It's a pleasure to acknowledge deep gratefulness I owe to **Prof. Dr. Ismail Ibrahim**, Professor of Neurosurgery, Faculty of Medicine, Cairo University whose expertise, lucid presentation and fatherly help have eased my task.*

*I would like to express my gratitude and immense indebtedness to **Prof. Dr. Nasser El-Ghandour** Professor of Neurosurgery, Faculty of Medicine, Cairo University, for his precious guidance, invaluable support and generous supervision.*

*I pay a very special tribute to **Prof. Dr. Wael El-Mahdy**, Professor of Neurosurgery, Faculty of Medicine, Cairo University, for his teaching, unlimited help, valuable advice and generous supervision.*

*My Gratitude to **Prof. Dr. Ahmed Hegazy**, for his surgical guidance and support and unlimited help advice and effort.*

*I am honored to express my sincere thanks and profound gratitude to **Prof. Dr. Abdel-Alim Ragab** and **Prof. Dr. Essam Rashad**, for their unfailing support, encouragement, valuable advice and unlimited help and kindness.*


DEDICATION
This work is
dedicated to
My Mother, Father,
Wife and Children

CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

ACD	: Anterior cervical discectomy
ACDF	: Anterior cervical discectomy and fusion
Ant.	: Anterior
C	: Cervical
CSF	: Cerebrospinal fluid
CT	: Computerized tomography
DDD	: Degenerative disc disease
DTPA	: Diethylenetriamine pentaacetic acid
EMG	: Electromyography
HNP	: Herniated nucleus pulposus
IDD	: Internal disc disruption
Lt	: Left
mm	: Millimeter
MRI	: Magnetic resonance imaging
NCS	: Nerve conduction studies
no.	: Number
NSAIDs	: Non steroidal anti- inflammatory drugs
PLL	: Posterior longitudinal ligament
ROM	: Range of motion
Rt	: Right
SD	: Standard deviation
SEP	: Somatosensory evoked potentials
T	: Thoracic
TCAs	: Tricyclic antidepressants

ABSTRACT

Objective: This study details assessment of the indications, safety, efficacy and complications of posterior microscopic cervical foraminotomy for treatment of cervical radiculopathy associated with cervical foraminal disc herniation and / or cervical foraminal stenosis of degenerative etiology. **Methods:** A prospective study conducted on 31patients with unilateral single or double level cervical radiculopathy due to cervical degenerative disc disease confirmed by concordant clinical and radiological data, refractory to non-surgical measures for 3 months at least, admitted and operated at Kasr El-Ainy university hospitals between March 2009 and August 2010. Outcomes were assessed by using the Odom's criteria. **Results:** Average age of presentation was 44.1 years, male to female ratio was 1:1.8, and average duration of symptoms was 51.4 weeks. 21 cases had left sided radiculopathy, 10 cases had right sided affection. The most common presenting symptom after brachialgia (100%) was neck pain (87%), most common sign was hyporeflexia (67%). Most common operated level was C5-6 (50%). Excellent and good outcomes were obtained in 87% of the patients. The mean follow up period was 14.5 months with no recurrence, instability or progressive kyphosis. **Conclusion:** Microscopic posterior cervical foraminotomy is a safe and effective approach for treatment of cervical radiculopathy resulting from foraminal hard and soft disc pathologies with comparable results to the ACDF approach.

Key words:

Cervical spine,
Disc herniation,
Foraminotomy,
Radiculopathy,
Neural foramen

INTRODUCTION

INTRODUCTION

Cervical radiculopathy is typically characterized as pain in the anatomic distribution of a single cervical nerve root. Sensorimotor impairment of the same nerve root may or may not be simultaneously present. Not uncommonly, multiple nerve roots may be affected simultaneously, leading to multilevel radiculopathy (***Carette and Fehling, 2005).***

Cervical radiculopathy is usually the result of either a soft lateral disc displacement or spondylosis with resultant foraminal compromise caused either by a calcified disc, osteophyte, or both. ***(Carette and Fehling, 2005)***.

The management of cervical radiculopathy is a controversial area in spine surgery. Although most patients are thought to achieve resolution of symptoms without surgical intervention, recent data, including randomized controlled studies have provided evidence that surgical intervention may improve short-term disability related to pain when compared with conservative management ***(Fouyas*** *et al.,* ***2002).***

When surgical intervention is chosen, the surgical approach can vary significantly. Although posterior approaches have traditionally been favored in the management of radiculopathy ***(Gregorius*** *et al.,* ***1976),*** in recent years anterior approaches have been favored by some due to the ease of exposure, wider exposure of the disc space, and less patient discomfort. Unfortunately, symptomatic adjacent-segment disease has been found to develop frequently with time after anterior cervical arthrodesis and affects long-term patient outcomes ***(Jagannathan*** *et al.,* ***2008).***

The posterior cervical approach was popularized by Spurling and Scoville **(Scoville and Whitcomb, 1966*)*** and Frykholm ***(Frykholm, 1947)***.

The results obtained in many early series were quite good, even by today's standards. The limitations of the posterior approach when used to treat compression located more centrally in the spinal canal. By 1955 Smith and Robinson ***(Aronson** et al., **1968)*** had pioneered the anterior approach for discectomy and fusion. The ACD was subsequently modified by Cloward ***(Cloward, 1958)*** and then by proponents of ACD without fusion. Although during the ensuing three to four decades the anterior approach for cervical disc disease became more widely used, there were some advocates of the posterior approach who reported obtaining good results in large series of patients ***(Jagannathan, 2009)***.

Progress in imaging techniques has allowed for much more thorough preoperative assessment and characterization of the specific indications for the posterior approach.

There are clear advantages of performing a posterior cervical foraminotomy, particularly in patients with cervical radiculopathy. Posterior decompression allows better access to eccentrically located disc fragments while obviating the need for retraction on the esophagus and laryngeal nerve, which can result in postoperative dysphagia and hoarseness following anterior approaches. Additionally, pseudarthrosis, graft subsidence, and kyphosis, which are well-reported complications of ACDF, can be eliminated when a posterior foraminotomy is performed ***(Coric and Adamson, 2008).***

AIM OF THE WORK