EVALUATING THE ROLE OF POSTERIOR APPROACH IN THE MANAGEMENT OF CERVICAL SPONDYLOTIC MYELOPATHY

Thesis

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بسم الله الرحمن الرحيم

"قالوا سبحانك لا علم لنا إلا ما علمتنا، إنك أنت العليم الحكيم"

صدق الله العظيم
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ABSTRACT

Although cervical spondylotic myelopathy (CSM) is one of the most common spinal disorders, its natural history, path physiology, and optimal treatment are controversial. Cord compression is well recognized in association with CSM, but dynamic factors have increasingly been studied. Cervical laminectomy relieves cord compression but does not address these dynamic forces and may have a deleterious effect on long-term outcome if it leads to kyphosis or instability. Cervical laminectomy with fixation has been evaluated in a few studies; this prospective study was conducted to evaluate the risks, clinical characteristics, and functional and radiographic outcomes for a select group of patients with CSM who underwent cervical laminectomies alone or with posterior lateral mass fixation.

Key wards:
Cervical, Laminectomy, Myelopathy, Lateral mass, Fixation.

I Dedicate

This work

To my beloved ones

My Family

&

My Friends

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List of Abbreviations

ACD	: Anterior cervical discectomy
ACDF	: Anterior cervical discectomy with fusion
ALL	: Anterior longitudinal ligaments
AREZ	: Anterior root entry zone
C1	: 1st cervical vertebra (atlas)
CSM	: Cervical spondylotic myelopathy
CT	: Computed tomography
JOP	: Japanese orthopedic association score
LCM	: Longus colli muscle
MEPs	: Motor evoked potentials
MRI	: Magnetic resonance imaging
PLL	: Posterior longitudinal ligament
SSEPs	: Somato-sensory evoked potentials
T1	: 1st thoracic vertebra
UP	: Uncinate process
Va	: Vertebral artery
VB	: Vertebral body

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INTRODUCTION

INTRODUCTION

Since the first successful cervical laminectomy was performed by Sir Victor Horsley, dorsal decompression of the cervical spine has become a standard approach in the treatment of cervical spondylotic myelopathy (CSM) secondary to congenital or acquired spinal canal stenosis. Such a dorsal approach can be performed with relative ease and safety and provides free access to the spinal canal, the foramina, the lateral disc space, and the intradural contents (**Collias and Roberts,2000)**.

The modern paradigm for managing CSM uses both ventral and dorsal approaches, with ventral procedures being more common. The ventral procedures consist primarily of discectomy, with or without vertebrectomy, followed by fusion, but it is more technically demanding when addressing multilevel disease, and carries the risk of accelerated juxtafusion degeneration (**Epstein, 2003)**.

The symptoms and syndromes of (CSM) can be closely mimicked by a number of other neurological disorders, including amyotrophic lateral sclerosis, multiple sclerosis, and syringomyelia, and diagnostic evaluations must keep this differential in mind patient history, detailed neurological examination, and radiographic imaging are the primary basis of diagnosis in CSM cervical magnetic resonance imaging scanning is currently the imaging modality of choice, although computed tomography scanning with or without myelography remains useful for better delineation of bony anatomy plain films with dynamic views are valuable adjuncts in the evaluation of spinal geometry and segmental instability (**James, 2007)**.

Management choices include conservative and surgical approaches. In patients with mild, static disease or who are poor surgical candidates, a trial of conservative management with rigid collar immobilization, physical

therapy regarding the natural history of the disease, in patients with moderate-to-severe myelopathy or with progressive myelopathy, surgical management is appropriate (**Boyce and Wang, 2003)**.

Aim of the work

The aim of this work is to review the up-to-date literature concerning the subject of the posterior approach in the treatment of cervical spondylotic myelopathy. An idea will be given about the anatomy and biomechanics of cervical spine and the pathogenesis of cervical myelopathy. Much details will be on the management of this disease, concentrating upon the up-to-date diagnostic procedure and the different techniques of the posterior approach to cervical spine, we will compare our results to the published results of posterior approach, also we will compare the result of posterior approach to those of the anterior approach to evaluate the effectiveness of posterior approach in treating cervical spondylotic myelopathy.

REVIEW OF LITERATURE

CHAPTER 1

EMBRYOLOGY OF CERVICAL SPINE

The skeleton is a derivative of mesoderm including not only its axial and appendicular divisions but also all accessory bones. Most of these parts enter a blastemal stage of mesenchymal condensation and this transforms into a cartilaginous stage before becoming ossified.

The skeletal axis:

Before reaching its final condition the skeletal axis passes through three preliminary stages:

In the first stage it is formed by the non-segmental notochord. The notochord is derived from the endoderm and consists of a rod of cells which lies on the ventral aspect of the neural tube; it constitutes the foundation of the axial skeleton, since around it the segments of the vertebral column are formed. It extends throughout the entire length of the future vertebral column and reaches as far as the region of future dorsum sellae of the sphenoid bone at the anterior end of mid-brain **(Ordahl, 1993)**.

In the second stage the notochord provides a framework around which a blastemal of mesenchymatous vertebral column is formed. The paraxial mesoderm is subdivided into a number of more or less cubical segments; the primitive segments (Epithelial Somites) **(Fig. 1-1)**. These are separated from one another by inter segmental septa and to every segment a spinal nerve is distributed.