بسم الله الرحمن الرحيم

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Evaluation of Outcome of Different Neurosurgical Modalities in Management of Cervical Dystonia

Thesis

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﴿قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا ۖ إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ﴾

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البقرة (٣٢)

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List of Abbreviations

Abbreviation	Full Term
AARS	Atlanto-Axial Rotatory Subluxation
Ach	Acetylcholine
ACOM	Anterior communicating artery aneurysm
AD	Autosomal dominant
AR	Autosomal recessive
AVM	Arteriovenous malformation
BGTC	Basal ganglia thalamocortical
BTX	Botulinum toxin
CD	Cervical dystonia
DA	Dopamine
DRD	Dopa responsive dystonia
EEG	Electroencephalography
EMG	Electromyography
fMRI	Functional MRI
GABA	Gamma aminobutyric acid
GPe	Globus pallidus extrena
GPi	Globus pallidus interna
HIV	Human immunodeficiency virus
L-dopa	L-dihydroxyphenylalanine
LTD	Long term depression

LTP	Long term potentiation
PET	Positron emission tomography
PPN	Pedunculopontine tegmental nucleus
RDP	Rapid-onset dystonia–parkinsonism
SNc	Substantia nigra compacta
SNr	Substantia nigra reticularis
STN	Subthalamic nucleus
TMS	Transcranial magnetic stimulation
TWSTRS	Toronto Western Spasmodic Torticollis Rating Scale
VA/VL	Ventral anterior and ventral lateral nuclei of the thalamus

Introduction

Focal dystonia affects a single body part, were dystonia involving the neck muscles is called “cervical dystonia” (1).

The older term used for this condition is “torticollis” or “spasmodic torticollis. These terms can be misleading, because “torticollis” implies an impairment that is purely rotatory, whereas patients often have combined postures associated with flexion, extension, or side bending. Additionally, the term “spasmodic” is applied to describe movements that are intermittent or clonic and tremulous (2).

Cervical dystonia (CD) is the most common type of the focal, idiopathic, adult-onset dystonia encountered in a movement disorder clinic (3, 4). In cervical dystonia, painful sustained or intermittent tonic contractions of the sternocleidomastoid, trapezius, and deeper neck muscles occur, often unilaterally, and cause abnormal head positions. The involved neck muscles are often hypertrophied. Sternocleidomastoid muscle contraction causes rotation of the head and lifting of the chin to the contralateral side and lateral bending (tilt) to the ipsilateral side. Rotation may involve any plane but almost always has a horizontal component (1).

CD is often associated with significant disability and pain which affects patient’s quality of life (5, 6).

Therapy for CD is mainly symptomatic (7). It includes supportive therapy and counseling, physical therapy, pharmacotherapy, chemo-denervation (botulinum toxin, phenol, alcohol), and central and peripheral surgical therapy. Although the most widely used and accepted therapy for CD is local intramuscular botulinum toxin injection, up to one-third experience an inadequate response to this treatment (8, 9). Pharmacotherapy, including anticholinergics,

dopaminergic drugs, and muscle relaxants can be used alone or in combination with other therapeutic interventions (10).

Surgery is usually indicated for patients with CD in whom there is failure of maximal medical management either due to poor response or occurrence of intolerable side effects, significant disability that significantly impact quality of life, patient should have no cognitive or psychiatric impairment and should be able to fully cooperate with the procedure and long-term follow-up and has no medical contraindications to surgery (1, 11-13).

Aim of the Work

Assessment of patients with cervical dystonia after different neurosurgical procedure used for management using reliable outcome measurement scores (Toronto Western Spasmodic Torticollis Rating Scale and Tsui score) and possible complications after different neurosurgical procedure used for management (Selective peripheral denervation techniques, pallidotomy, or bilateral globus pallidus internus deep brain stimulation).