

MANAGEMENT OF SPASTICITY
DUE TO SPINAL CAUSES

Thesis

***Submitted in partial fulfillment of the M.D degree
in Neurosurgery***

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2014

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رسالة مقدمة من

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بسم الله الرحمن الرحيم

"وقل اعملوا فسيرى الله عملكم ورسوله والمؤمنون .."

صدق الله العظيم

سورة التوبة من الآية ١٠٥



First, thanks are all due for **Allah**, for blessing this work until it has reached its end.

I wish to express my thanks to **Professor Dr. EMAD GHANEM**, professor of neurosurgery, Ain Shams University, for the valuable supervision and continuous help he has given me since I started this work.

I also wish to express my deepest gratitude to **Professor Dr. HISHAM SIMRY**, professor of neurosurgery, Ain Shams University, for his inspiring guidance and support throughout this work.

Special and great thanks for **Prof. Dr. Wael Abdel- MONEM**, professor of neurosurgery, Ain Shams University, to whom I am deeply indebted for constantly encouraging me to develop this work.

I am greatly indebted and honored to work under the supervision of the knowledgeable **Prof. Dr. WALED AHMED ABD AL GHANY**, assistant professor, Ain Shams University, whom I am very fortunate to be one of his students. His creative ideas, expanded experience and willingness to teach, have pushed me forwards throughout every step of my research.

I also express my thanks to my *senior colleague* and to all my *professors* and *colleagues* in the neurosurgery department, for all the help and advice they have given.

Finally I express my deepest gratitude to my *Father* , *Mather*, *children* and beloved *wife* who have stood by me and supported me throughout my life and career and especially during this work.

Aim of the Work

1. To review the literature of the up-to-date about definition, types, etiology and pathophysiological mechanisms of spinal spasticity.
2. To review the current spinal spasticity examination rating scales.
3. To outline the standard electrophysiological and physical assessment modalities.
4. To evaluate the current modalities involved in treatment of spinal spasticity including the inclusion criteria, exclusion criteria , techniques, complications , efficacy & outcome.

Appendix

LIST OF TABLES	VI
LIST OF FIGURES	VII
LIST OF ABBREVIATIONS	X
INTRODUCTION	1
AIM OF THE WORK	4
ETIOLOGY	5
PATHOPHYSIOLOGY	8
CLINICAL PRESENTATION	15
ASSESSMENT MEASURES	20
NON NEUROSURGICAL MANAGEMENT	33
THERAPEUTIC INTERVENTIONS	42
SURGICAL MANAGEMENT	49
PATIENTS AND METHODS	71
RESULTS	103
CASE REPORT	123
DISCUSSION	127
SUMMARY	136
CONCLUSIONS	140
REFERENCES	141
ARABIC SUMMARY	160

Abbreviations	Total abbreviations
BONT	Botulinum toxin
BTX-A	Botulinum toxin type – A
C	Cervical
CNS	Central Nervous Sysetm
CSF	Cerbro Spinal Fluid
CT	Computerized Tomography
DREZ	Dorsal root entry zone
DRT	Dorsal Reticulo-Spinal Tract
EMG	Electromyography
FDA	Food and Drug Administration
LE	Mean
IOM	Intra-operative monitoring
ITB	Intrathecal Baclofen
L	Lumbar
MAS	Modified Ashworth score
MDT	Microsurgical DREZotomy
mm	Millimeter
MRCS	Medical research council scale
MRI	Magnetic Resonant Image
MRT	Medial Reticulo-Spinal Tract
MS	Multiple Sclerosis
Post.Op	Post-Operative
P-Value	Probability
ROM	Range of motion
R-Test	Correlation Coefficient
Sc	Second
SCI	Spinal Cord Injury
SD	Standard Deviation
SG	Substantia Gelatinosa
SPN	Selective peripheral neurotomy
SPSS	Statistical Program of Social Signs
T	Thoracic
T.M	Transverse Myelitis
U	Unit
UMNL	Upper motor neuron lesion
UMNS	Upper motor neuron syndrome
VST	Vestibulo-Spinal Tract

NO. TABLE	TABLE	PAGE
1.	Positive and Negative Motor Signs in the Upper Motor Neuron Syndrome.	18
2.	Upper Motor Neuron Syndrome	18&19
3.	Modified Ashworth scale	21
4.	Medical Research Council Scale for motor testing	22
5.	The Oswestry scale	31
6.	Oral medications used in treatment of spasticity	40
7.	Dosing Guidelines for treatment of patients with motor neuron syndrome	45 &46
8.	Demonstrating changes in the mean values of MAS through the follow up period	106
9.	Demonstrating statistical significance of change of the mean MAS pre operatively & six months post-operative	107
10.	Demonstrating changes in the mean MRCS through the follow up period	108
11.	Demonstrating statistical significance of change of the mean MRCS pre operatively & six months post-operative	108
12.	Demonstrating changes in the mean ROM for knee joints through the follow up period	109
13.	Demonstrating statistical significance of	110

	change of the mean ROM pre operatively & six months post-operative	
14.	Demonstrating changes in the mean values of MAS through the follow up period	111
15.	Demonstrating statistical significance of change of the mean MAS pre operatively & six months post-operative	112
16.	Demonstrating changes in the mean MRCS through the follow up period	113
17.	Demonstrating statistical significance of change of the mean MRCS pre operatively & six months post-operative	113
18.	Demonstrating changes in the mean ROM for knee joints through the follow up period	114
19.	Demonstrating statistical significance of change of the mean ROM pre operatively & six months post-operative	115
20.	Demonstrating changes in the mean values of MAS through the follow up period	117
21.	Demonstrating statistical significance of change of the mean MAS pre-operatively & six months post-operative	117
22.	Demonstrating changes in the mean MRCS through the follow up period	118
23.	Demonstrating statistical significance of change of the mean MRCS pre-operatively & six months post-operative	119

24.	Demonstrating changes in the mean ROM for knee joints through the follow up period	120
25.	Demonstrating statistical significance of change of the mean ROM pre-operatively & six months post-operative	120
26.	Demonstrating the difference in the mean MAS in the sixth month post-operative assessment in all groups	121
27.	Demonstrating the difference in the mean MRC in the sixth month post-operative assessment in both groups	122
28.	Demonstrating the difference in the mean angle of ROM in the sixth month post-operative assessment in both groups	122

NO. OF FIG.	FIGURE	PAGE
1.	Spinal canal anatomy	6
2.	Pathogenesis of spasticity	7
3.	Monosynaptic stretch reflex arc	9
4.	Alpha motor neurons and gamma motor neurons pathway.	11
5.	Neuromuscular spindle	12
6.	Anterior Cord Syndrome	16
7.	Central Cord Syndrome	16
8.	Brown-Séquard syndrome	16
9.	Electromyographic test	24
10.	The H-reflex (late response)	26
11.	The F-wave	27
12.	The F-wave is valuable for evaluation of cord injury	28
13.	Proposed algorithm for treatment of hypertonia in pediatric age group, Ain Shams University Hospitals (2004).	34
14.	Treatment planning for patients with spasticity	35
15.	Physical Therapy	36
16.	Functional Electrical Stimulation	37
17.	Serial inhibitory casting	55
18.	Presumed site of action of drugs with	39

	antispastic effects	
19.	Tibial neurotomy	54
20.	Obturator neurotomy	55
21.	Dissection of the popliteal fossa	57
22.	Special device for nerve fascicle stimulation	58
23.	Intrathecal Baclofen	66
24.	The pump protrudes from under the skin and becomes vulnerable to trauma or infection	69
25.	Manual goniometer	75
26.	The intra-operative neurophysiologic device	76
27.	Selective tibial neurotomy(vertical, transverse incisions)	82
28.	Operative exposure of the branches of the tibial nerve	83
29.	Femoral neurotomy	87
30.	Prone position for microsurgical DREZotomy	91
31.	Intraoperative microscopic view of the dorsal root entry zone (DREZ)	94
32.	Chart of the clinical presentation of patients in all groups	103
33.	Chart of the levels of spinal cord injury in our series	104
34.	A bed sore occurring at the medial aspect of right knee in a paraplegic girl	104
35.	Percentage of neurotomies done in group A	106

36.	Significant decrease in the mean MAS	107
37.	Decrease in the mean muscle power, followed by increase in the follow-up period	109
38.	Increased joint ROM after neurotomies, and maintained with continuous stretching and splinting exercises	110
39.	Decrease in the mean MAS with mild changes through the follow-up period	112
40.	Decrease in the mean muscle power, followed by increase through the follow-up period	114
41.	Increased joint ROM, and maintained with continuous stretching and splinting exercises	115
42.	Decrease in the mean MAS with mild changes through the follow-up period	118
43.	Decrease in the mean muscle power, followed by increase through the follow-up period	119
44.	Increased joint ROM, and maintained with continuous stretching and splinting exercises	121
45.	Case report 1	123
46.	Case report 2	124
47.	Case report 3	126
48.	Me intraoperative.	126

Introduction

The word *spasm* comes from the Greek word, *spasmos*, meaning to pull or drag. *Spasticity* is defined as an involuntary, velocity-dependent, increased resistance to stretch. This definition means that the amount of resistance to stretching is at least partly determined by the speed with which a spastic muscle is stretched (**Burne JA,et.al 2005**)

Spasticity may be static or dynamic in nature. Although many therapeutic and medical interventions can attenuate its effects, spasticity can be severely debilitating (**Young RR ,1994**)

Spasticity can result from any disease process that affects the upper motor neuron within the CNS. Injury to the upper motor neuron decreases cortical input to the descending reticulospinal and corticospinal tracts, which causes weakness, loss of motor control, and reduction in the number of voluntarily active motor units. The reduction of these descending tracts removes the normal inhibition of the reflex arcs within the grey matter of the spinal cord, leading to a hyperactive reflex arc and spasticity (**Mandigo & Anderson, 2006**).

Spasticity inhibits effective use of motor control and strength and can lead to progressive musculoskeletal