MANAGEMENT OF Thoracic Outlet Syndrome

ESSAY

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General Surgery

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CONTENTS

List of Figures

List of Abbreviations

a.	Artery
Ant.	Anterior
BTX	Botulinum Neurotoxin
C	Cervical
CK-MB	Creatinine phosphokinase – MB fraction
CT	Computed Tomography
CRPS	Complex Regional Pain Syndrome
dn TOS	Disputed neurogenic thoracic outlet syndrome
EAST	Elevated Arm Stress Test
EMG	Electromyography
LAC	Lateral Antebrachial Cutaneous Nerve
LMNL	Lower Motor Neuron Lesion
m.	Muscle
MAC	Medial Antebrachial Cutaneous Nerves
Med.	Medius
mm.	Minimus
MNCS	Motor Nerve Conduction Study
MR	Magnetic Resonance
MRA	Magnetic Resonance Angiography
MRI	Magnetic Resonance Image
MRN	Magnetic Resonance Neurography
NCS	Nerve Conduction Study
nTOS	Neurogenic Thoracic Outlet Syndrome
Post.	Posterior
PSV	Peak Systolic Velocity
PTT	Partial Thromboplastin Time
SCA	Subclavian Artery
SNCS	Sensory Nerve Conduction Study
SNAP	Sensory Nerve Action Potential
SSEPs	Somatosensory Evoked Potentials
T	Thoracic
TENS	Transcutaneous Electrical Nerve Stimulation
TOS	Thoracic Outlet Syndrome
UMNL	Upper Motor Neuron Lesion
v.	Vein
vTOS	Vascular Thoracic Outlet Syndrome

Introduction and Aim of The Work

Introduction

Thoracic outlet syndrome is a complex symptoms consisting of neural, arterial, and venous disorders of the upper extremity. These are caused by compression of the neurovascular structures between the clavicle and first rib in the thoracic outlet **(Urschel HC., 2000).**

Thoracic outlet syndrome has been an important clinical entity for more than a century. In 1821, Sir Astley Cooper first described axillary–subclavian artery symptoms due to compression from a cervical rib. In 1875, James Paget described the clinical symptoms resulting from subclavian vein thrombosis. In 1884, von Schroetter correctly attributed these upper extremity venous symptoms to thrombosis or compression of the subclavian vein at the thoracic outlet. Consequently, venous thrombosis at the thoracic outlet is known as venous thoracic outlet syndrome **(Eskandari MK et al., 2007).**

Cooper described the clinical symptoms of neurovascular compression in the thoracic outlet area in 1921. In 1931, Telford emphasized the important role that the first rib and cervical rib play in neurovascular

compression of the upper extremity. In 1935, Ochsner introduced the term scalenus anticus syndrome following several reports on scalene muscle abnormalities as the cause of thoracic outlet syndrome. In 1956, Peet first used the term thoracic outlet syndrome to express cervical-brachial pain, numbness, and other disorders of the upper extremity. In 1958, Rob proposed the term thoracic outlet compression syndrome **(Atasoy E., 2004).**

Neurogenic Thoracic outlet syndrome most commonly is associated with a history of neck trauma. Swollen and scarred muscles or aberrant scalene anatomy can irritate cords of the brachial plexus locally and lead to the neurologic symptoms. Arterial Thoracic outlet syndrome is often associated with cervical ribs or a rudimentary first rib. This aberrant anatomy leads to repeated intermittent arterial compression coinciding with arm movement. Venous Thoracic outlet syndrome usually results from compression of the subclavian vein by the subclavius muscle and costoclavicular ligament **(Eskandari MK et al., 2007).**

Because no objective confirmatory test is available for thoracic outlet syndrome, there is much disagreement with regards to its true incidence, with reported figures ranging from 3-80 cases per 1000 people. The sex ratio

varies depending on the type of thoracic outlet syndrome (eg, neurologic, venous, arterial). Overall, the entity is approximately 3 times more common in women than in men.

- Neurologic - Female-to-male ratio approximately 3.5:1
- Venous - More common in males than in females
- Arterial - No sexual predilection

The onset of symptoms usually occurs in persons aged 20-50 years **(Chang AK et al., 2008).**

Clinical features of neurogenic Thoracic outlet syndrome include intermittent symptoms of nerve compression in most patients, which include pain, paresthesias, and weakness. Venous Thoracic outlet syndrome may be characterized by upper extremity edema, venous engorgment. Arterial compression may present with loss of radial pulse, upper extremity claudication, or thrombosis.

The diagnosis of neurogenic Thoracic outlet syndrome is initially made clinically. A thorough history and physical exam, as well as a plain cervical spine x-ray series, can be performed to evaluate cervical spine disease. Maneuvers that may be performed in the clinic to help diagnose Thoracic outlet syndrome include the Adson or