

**Dr. P. Heaton.**

Consultant Orthopaedic Surgeon.

FRCS (Tr & Orth) Ph.D.

Lower Limb Arthroplasty  
(Hip and Knee).

Trauma.

Pelvic and Acetabular Fracture Surgery.

**Cyclo-ssage Pro-Personal Therapy System. [PPTS]  
In the prevention and treatment of activity induced Back Pain.  
By Dr. P. Heaton-Ph.D.  
Consultant Orthopaedic Surgeon.  
Part 2.**

### **Cervical Myelopathy**

Cyclo-ssage Pro Personal Therapy System in the prevention and treatment of pathology induced back pain Part 2

In this article we discuss pathology induced compression neuropathy causing back pain in the neck presenting classically as the condition known as cervical myelopathy.

Cervical myelopathy is a clinically symptomatic dysfunction of cervical spinal cord. It is usually chronic and is almost always progressive.

#### **Pathophysiology**

The condition almost always begins with intervertebral disc damage. Discs that lose their water content will progress to lose the structural function of their matrix of proteoglycan (special proteins). Further disc disease may lead to disc prolapse and formation of osteophytes, thickening (hypertrophy) of supportive ligaments such as the ligamentum flavum. Ultimately, compression of the cervical spine cord results, compromising the patient's functions.

#### **Symptoms and signs**

Clinical presentation is dependent on the level and extent of compression. A high level cervical spinal cord compression will affect both upper and lower limb functions and will almost certainly be more debilitating.

Compressions involving several segments of the cervical spinal cord present with more severe loss of function.

Impairment of neck range of movement, particularly rotational movement is a hallmark of myelopathy.

Clinically, only fifty percent of all myelopathic patients will present with neck pain. Neck pain in cervical myelopathy is often associated with loss of dexterity and hand grip strength. Often described as "clumsy hands" some patients may experience frequent episodes of dropping objects due to the arm muscle weakness. Limb weakness affects ninety five percent of all cervical myelopathy patients due to the compression of the Cortico-spinal tracts. When profound, leg weakness often results in gait abnormality, recurrent falls and attendant risk of falls.

Ultimately, loss of independence and requirement for institutionalisation result from progression of the condition.

The Nurick and Ranawat classifications are used by physicians and surgeons to monitor the condition and support the need for interventional treatment.

#### **Nurick Classification of Disability from Cervical Myelopathy**

Grade I No difficulty in walking

Grade II Mild gait involvement not interfering with employment

Grade III Gait abnormality preventing employment

Grade IV Able to walk only with assistance

Grade V Chair-bound or bedridden

#### **The Ranawat classification of neurologic deficit**

Class I - No neural deficit

Class II - Subjective weakness, dysesthesias, and hyperreflexia

Class IIIA - Objective weakness and long-tract signs; patient remains ambulatory

Class IIIB - Objective weakness and long-tract signs; patient no longer ambulatory

#### **Investigations**

All patients should have an anterior-posterior and a lateral view xrays of the cervical spine. Following x-rays, magnetic resonance imaging (MRI) scan of the cervical spine will identify the involved level(s) and the extent of compression. Electromyographic (EMG) studies may delineate the residual function of muscle that have had its nerve supply compressed.

#### **Management**

The focus of management of this condition aims to prevent progression and the consequential loss of patient function. This is achieved by conservative or surgical treatment. Clearly when cervical myelopathy is severe, surgery by an experienced surgeon is required, urgently.

Lesser degree of compression can be treated conservatively.

Conservative management requires the specialist input of a neurophysiologist, physiotherapist and orthopaedic specialist. Several protocols may be used, but most will combine analgesia, manipulations and traction.

An emerging field in the current concepts clinical and research frontiers is the use of vibrothermometric systems such as the pro-personal therapy system (PPTS) in the treatment of neuromuscular diseases such as cervical myelopathy and Duchennes muscular dystrophy.

For myelopathic patients the loss of hand grip strength and dexterity can be disabling.

The cyclo-ssage PPTS deliver mechanical and thermal stimuli to the entire cervical spine. In diseased conditions such as cervical myelopathy when muscle units lose their synchronisation, stimulation of the muscle spindle by the PPTS cycloid pattern of vibration induce changes in muscle length. The resulting activation of muscle spindles elicits a reflex contraction of the muscle. The PPTS vibratory stimulus therefore leads to cyclic elongation and contraction of the stimulated muscles, which results in measurable increases in muscle strength, affording the affected patient better hand grip strength and improved dexterity.

At our treatment unit in Barley Cliff, patients will regularly feedback after every treatment, improved grip strength, reduced neck stiffness and improved flexibility after one treatment. Admittedly, sustained flexibility can only be maintained by regular treatments (typically three to four times a week) on the PPTS.

The whole body stimulatory effect of the PPTS may improve bone strength and even confirm strength to other tissues in the musculoskeletal system by increasing bone mineral density, but further research is required to substantiate this hypothesis.