



Case Report

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Rapid Recovery with Physiotherapy in An Adult with Surgically managed Torticollis and Associated Cervical Myelopathy

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Abstract

Torticollis which is a relatively temporary condition rarely seen till adulthood. However, if untreated during childhood may develop complications later which may include musculoskeletal or neurological structures around neck. It may range from contracture of soft tissue to involvement of neural structures. However neurological complications are rare and may require surgical correction. Case description: Here, a 16-year-old male patient who reported physiotherapy department with chief complaint of difficulty in movement of bilateral upper and lower limb difficulty in standing and difficulty in walking independently and breathlessness on exertional activity. Result: After 2 months of physiotherapy treatment berg balance scale score improved from 20/56 to 51/56, dynamic gait index score improved from 10/24 to 15/24, Modified fatigue impact scale score improved from 51/84 to 12/84. Conclusion: Neurological complication of Torticollis in a 16-year-old patient could be reversed partially resulting in functional improvement, with surgery and appropriate Physiotherapy treatment.

Keywords: Neurological complication, Torticollis, Cervical Myelopathy.

INTRODUCTION

Torticollis, also known as a twisted neck, it is the contraction or contracture of the muscles of the neck that causes the head to tilt to one side. It is accompanied by rotation of the chin to the opposite side with flexion [1]. It is a congenital or acquired deformity. Although it is a sign of an underlying disease process, its presence does not imply a specific diagnosis, and the cause should be sought if torticollis persists or it is associated with other symptoms. Congenital torticollis, seen in neonates and infants, usually results from craniocervical vertebral anomalies or muscular causes, although ocular abnormalities such as congenital paralytic squint (strabismus) and congenital nystagmus should also be considered [2].

Cervical myelopathy is a condition describing a compression of the spinal cord at the cervical level of the spinal column resulting in spasticity (sustained muscle contractions), hyperreflexia, pathologic reflexes, digit/hand clumsiness, and/or gait disturbance. Classically it has an insidious onset progressing in a stepwise manner with functional decline. Characteristic MRI findings are Canal space of less than 10 mm [3].

CASE REPORT

Patient gradually started complaining of weakness in bilateral upper limb and lower limb which was progressive in nature since the age of 10 years. After few days he experienced tightness in his bilateral lower limb in the early morning because of that he had difficulty in walking. Then he visited to local hospital where investigations were done and doctor told his parents that these complaints are due to bending of neck to left which resulted in compression of nerve and produced tingling. Medications were given but he had no relief. His condition got severe, his weakness in bilateral upper and lower limb was increased and he felt tingling in his bilateral upper and lower limb after crossing his leg but he was able to walk with difficulty. After few months at the age of 10 years he visited to VPMH at that time he was unable to walk, able to stand but with maximum support and had severe difficulty in movement of his bilateral upper and lower limb. Investigations were done and he was suggested for surgery at the age of 10 years. On 30 June 2018 he underwent surgery [Occipito C2 fusion using occipital plates]. He was on complete bed rest for 1 month in hospital and physiotherapy treatment for bed mobility exercises were

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given continuously. After one month he was taken in sitting position by therapist. After 3 months of physiotherapy treatment he was able to stand from sitting with maximum support, initiated walking with walker and had difficulty in movement of bilateral upper and lower limb. After discharge he continued his exercises at home for few months.

He came to VPMH 6 years [age 16 years] after surgery with the complaint of difficulty in movement of bilateral upper and lower limb, difficulty in standing and difficulty in walking independently and severe breathlessness after doing any activity and tingling in bilateral upper and lower limb after cross leg sitting. Currently he is under medications and physiotherapy treatment with complaint of same.

In past history he had a complaint of neck bending to left side and urge bowel incontinence. As mentioned in the surgical notes he underwent foramen magnum decompression with occipito C2 fusion using occipital plates. In personal history his appetite was reduced and he had urge incontinence type of bowel. On general observation his built was ectomorphic. His higher mental function were normal with MMSE score of 30/30. Superficial and deep and cortical sensations were intact. On muscle tone assessment there was spasticity of grade 1 in right shoulder adductor, grade 1+ in left elbow extensors and grade 1 in right elbow extensors. Muscle strength of bilateral upper and lower limb is mentioned in the table. Strength of abdominal muscles was fair and back extensors were poor. On reflex examination in superficial reflexes extensor plantar response elicited bilaterally and abdominal reflex was normal and all the deep reflexes were exaggerated. On coordination assessment all the equilibrium test were controlled but not smooth and accurate. And non equilibrium test cannot be assessed as he was not able to take test position. On hand function examination his grasp, grip and prehension was poor due to reduced strength of lumbricals dorsal and palmar interossei, flexor digitorum profundus. On assessment of muscle tightness there was tightness in bilateral TA,

hamstrings, hip Adductor and Hip flexor. On postural examination left shoulder was slightly lower than right shoulder, there was lateral trunk bending to left side, Left pelvic was slightly higher than right pelvic, Right hip was more externally rotated then left and there was more weight bearing on right leg then left leg. On balance examination his sitting balance was good his static standing balance was fair and his standing dynamic balance is poor.

In this study we have assessed the patient with the help of berg balance scale, dynamic gait index, modified fatigue impact scale and modified function reach test. In berg balance scale total scores below 45 are associated with a higher risk of falls and score of less than 40 is associated almost with a 100% fall risk [4], In dynamic gait index score lower than 19 points has been associated with impairment of gait and fall risk [5], In modified fatigue impact scale scores of 38 or above are indicative of fatigue [6]. In modified function reach test minimum value for forward reach is less than 5.6 inch (14.22cm) and for lateral reach is 3.8 inch (9.65cm) [7].

Investigations:

MRI investigation done on 23/05/2018 (at the age of 10years) suggestive of Retro-inclination of dens of C2 vertebrae causing significant compression of cervico-medullary junction which shows thinning; suggestive of compressive myelopathy.

Physiotherapy Intervention:

The physical therapy program began when the patient was 18 years old and received Physiotherapy treatment for 7 days per week for 1.5 months by a Neurophysiotherapist according to the motor training and home program approach. The main purpose of the program was to improve the strength of B/L Upper limb & Lower limb, reduce tightness of the lower limb muscles, and to improve sitting Dynamic and standing static balance.

Table 1: Manual Muscle strength test grading of both upper and lower limb before and after intervention

Muscle group UL	Pre		Post	
	Right	Left	Right	Left
Shoulder				
Flexor	3	3	4-	4-
Extensor	3	3	4-	4-
Abductor	3	3	4-	4-
Adductor	3	3	4-	4-
Elbow				
Flexor	4	4	5	5
Extensor	4	4	5	5
Wrist				
Flexor	3	3	4-	4-
Extensor	3	3	4-	4-
Radial deviator	3	3	3	3
Ulnar deviator	3	3	3	3
Muscles group LL				
Hip				
Flexor	2	2	3-	3-
Extensor	2	2	3-	3-
Abductor	2	2	3-	3-
Adductor	2	2	3-	3-
Knee				
Flexor	3-	3-	4-	4-
Extensor	3-	3-	4-	4-
Ankle				
Dorsiflexor	3	3	4-	4-
Plantarflexor	3	3	4-	4-
Invertor	3	3	3	3
Evertor	3	3	3	3

(MRC grading system of Manual muscle testing)

Table 2: assessment of balance, gait, fatigue and reach forward and lateral at 4 different time intervals

Scales		17/7/23	07/08/23	23/08/23	17/9/23
Berg balance scale		20/56	24/56	37/56	51/56
Dynamic gait index		10/24	10/24	12/24	15/24
Modified fatigue impact scale		51/84	40/84	27/84	12/84
Modified functional reach test	Forward	5cm	6cm	13cm	17.6
	Lateral	Rt- 5 cm Lt- 7 cm	Rt- 7 cm Lt- 8 cm	Rt- 15cm Lt- 20cm	Rt-19.3cm Lt- 16.3cm

Table 3: Description of details of Intervention along with specific goals and functional status before and after treatment

Problem	Goal	Before treatment	Treatment	After treatment
Difficulty in overhead activities in sitting	To improve overhead activities in sitting within 2 weeks	Maximum difficulty to perform overhead activities in sitting	1. Resisted PNF for B/L UL × 7 reps with rest interval after every 2 reps ^[8] , 2. Scapular retractors, elevators, depressors strengthening ×5 reps with 5 sec hold ^[8]	Minimum to moderate difficulty in performing overhead activities
Difficulty in buttoning and unbuttoning	To improve Buttoning and unbuttoning within 2 week	Maximum Difficulty to perform buttoning & unbuttoning	1. Strengthening (Lumbricals, Interossei, Abductor pollicis brevis) by Manual Resistance, 2. Towel Scrunches, 3. Rubber band exercises Progression- With finger & hand grip exerciser ^[9]	Minimum to moderate difficulty in performing buttoning and unbuttoning
Difficulty in maintaining erect sitting position	To improve erect sitting position for longer period of time within 1 week	Able to maintain erect sitting for 2 mins	1. Abdominal curls × 7 reps with 5 sec hold ^[10] , 2. Prone on elbows × 5 reps with 5 sec hold, 3. Pelvic Bridging × 5 reps with 5 sec hold ^[10]	Able to maintain erect sitting for 15 mins
Difficulty in lower body Dressing	To improve lower body dressing & undressing within 2 weeks	Maximum difficulty in lower body dressing & undressing	1. Stretching of hamstrings, adductors × 20 sec hold 3 reps ^[11] , 2. Resisted PNF for B/L LL × 7 reps	Able to perform lower body dressing with minimum efforts
Difficulty in Sit to Stand independently	To improve sit to stand independently within 1 month	Performed sit to stand with maximum difficulty	1. Sit to stand training in parallel bars with mirror for feedback× 7 reps with rest interval after 2 reps to prevent fatigue ^[12] . 2. Multiple angle holds (5 sec) for sitting ^[13] .	Able to perform sit to stand independently
Unable to maintain erect standing independently	To improve erect standing position for longer period of time within 1 week	Unable to maintained erect standing position	Back extensor strengthening. Abdominal curls ^[10] . Dynamic knee extension with weight cuff ^[14] . Hip extensor strengthening with theraband ^[15] .	Able to maintain erect standing independently.
Difficulty in Walking independently	To improve walking independently	Difficulty in walking independently	Squats. ^[16] Lunges. ^[16] Stretching of bilateral hamstring and adductor ^[11] .	Able to walk independently
Difficulty in Stair Climbing	To improve stair climbing	Difficulty in stair climbing	Step up step down. Lower extremity strengthening ^[16] .	Able to do stair climbing.



Fig 1: Image of patient before surgery shows left sided Torticollis



Fig 2: Posterior view of spine with pelvis region: posterior superior iliac spine of left is slightly higher than right



Fig 3: Anterior view of spine with pelvis region: superior iliac spine of left is slightly higher than right

DISCUSSION

A 16-year-old boy with compressive myelopathy secondary to torticollis was evaluated and rehabilitated in this case report.

Chester J. Donnally reported that Patients presenting with cervical myelopathy predominately experience upper extremity symptoms which include hand clumsiness and a limited ability to perform fine motor tasks such as buttoning a shirt, combing hair, holding small objects, and differentiating coin sizes. In cases of lower extremity signs, patients typically ambulate with a wide-based gait, bowel or bladder dysfunction and general weakness [3]. In this case study patient had upper and lower limb weakness, bowel and bladder dysfunction and gait abnormalities

Konrad et al reported that congenital torticollis leads to neurological symptoms like radiculopathies, radiculomyelopathy due to narrowing of the spinal canal, radicular pain, spastic quadriparesis caused by spinal stenosis with compression of the spinal cord at C3/4 and C5/6 respectively [17]. In the present case study, patient had mild spasticity and poor motor control in bilateral upper and lower limb.

Charles H. Adler et al reported that congenital torticollis leads to symptoms like urinary incontinence, decreased rectal sphincter tone, sensory loss, progressive gait deterioration and spastic ataxia [18]. Our patient also suffered from mild rectal sphincter issue and difficulty in walking.

Charles H. Adler et al concluded in his study that in surgically treated patients there was no significant change in his spastic quadriparesis [18]. However, in the present case study, 2 months of physiotherapy treatment resulted in improvement in muscle strength, balance and gait. This is probably due to the fact that our patient had mild spasticity which did not interfere with motor function.

J A Waterston et al reported similar cases where cervical myelopathy was developed in patients with Torticollis. In this there were 2 cases studied in this one patient (Age 61) develop weakness in bilateral upper and lower limb urinary incontinence and was unable to stand and walk. In the other case patient (Age 19) initially experienced short episode of torticollis and nine months later, developed fixed torticollis to the left. In the next two years he continued to deteriorate despite medical treatment and a posterior cervical rhizotomy, becoming bed-ridden [19].

PNF was given with the aim of improving strength and control of the movement. This approach is based on neurophysiological principles of motor learning and control emphasizing functional movement [20]. Scapular muscle strengthening was given with the aim of improving strength of surrounding muscles of scapula and to improve over head activity. This approach is based on improving the strength and function of the muscles that control the position [8].

Bridging and abdominal curls was given with the aim of improving erect sitting and standing posture. This approach is based on improving strength of trunk stabilizers [10]. Squats and lunges was given with aim to improve gait and stairclimbing. This approach is based on improving strength of all lower limb muscles [16]. Sit to stand exercise was given with the aim of improving sit to stand. This approach is based on improving muscle strength. And improvement is due to repetitive practice, motor learning and task specific training [12].

CONCLUSION

Functional improvement in a surgically treated adult patient with Torticollis with associated Cervical Myelopathy can be attributed to vigorous Physiotherapy treatment with specific time bound goals and interventions.

Conflict of Interest

The authors declare no conflicts of interest.

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