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by Orthopedic & Sports Physical Therapy Associates, Inc.,
OSPTA@Home and Valley Outpatient Rehabilitation

Congenital Muscular Torticollis

Torticollis is a term used to describe asymmetrical posturing of the head and neck, in which a lateral translation of the head on the trunk occurs in addition to variable degrees of lateral head tilt and rotation. As a result, the child's chin points to one side and up. The term torticollis is derived from two Latin terms, *tortus* meaning "twisted," and *collum* meaning "neck."¹ Torticollis is not a diagnosis, but rather a sign of an underlying disorder. The majority of children who present with torticollis posturing during the first year of life have congenital muscular torticollis (CMT). The following will provide the healthcare professional with information on how to effectively identify and successfully manage this condition.

Definition:

Congenital muscular torticollis (CMT) is a condition caused by unilateral fibrosis of the sternocleidomastoid (SCM) muscle. The SCM muscle (Fig. 1) is the largest muscle in the anterior neck. It originates by way of two heads, one arising from the posterior aspect of the medial third of the clavicle and one arising from the manubrium of the sternum, to which it travels superiorly and posteriorly to attach on the mastoid process of the temporal bone. The SCM muscle is responsible for the actions of flexion, ipsilateral side-bending, and contralateral rotation. Therefore, when a fibrotic process occurs in the SCM muscle, it will cause the child to adopt a posture of cervical flexion, ipsilateral side-bending, and contralateral rotation in which the child's ear bends toward the affected side and the child's chin points toward

the unaffected side and up.

Etiology:

Although the etiology of CMT remains obscure, the most accepted etiologic explanation suggests changes in the SCM muscle similar to those of patients with

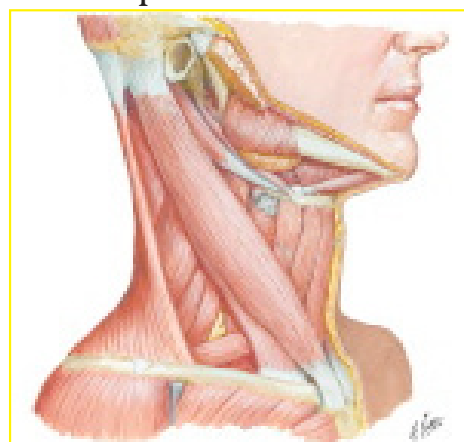


Fig. 1 Right sternocleidomastoid muscle

compartment syndrome. It is thought that classical CMT is the result of a compartment syndrome within the SCM muscle compartment caused by extreme forward flexion, lateral bending, and rotation of the infant's head within the birth canal. Kinking of the mid-substance of the ipsilateral SCM muscle is postulated to lead to an ischemic injury, resulting in nerve and muscle damage, followed by massive swelling.² These damaged muscle fibers are then replaced by fibrous tissue, accompanied by varying amounts of nerve degeneration and regeneration over time.² Therefore, some children will present with a palpable tumor in the mid-substance of the SCM muscle. It has also been determined that in children with CMT, both with and without the tumor, biopsies have revealed extensive fibrosis surrounding the muscle fibers.³ This fact supports the hypothesis that SCM fibrosis causes CMT.

Incidence:

Congenital muscular torticollis is the third most common congenital musculoskeletal anomaly, following developmental dysplasia of the hip and clubfoot. Currently, the incidence of CMT ranges from 0.4% to 1.9%.⁴

Clinical Features:

The classic presentation of CMT is a newborn of approximately two months of age with a tumor within the muscle belly of the SCM muscle. The contracture of the SCM muscle causes the infant's head to tilt toward the side of the tumor and the infant's chin to turn up and away from the side of the tumor. The tumor generally persists for 2 to 3 months and gradually disappears at about 4 to 6 months of age.⁵ The fibrotic tumor is typically described as a hard, painless swelling approximately 1-3 cm. in diameter within the substance of the SCM muscle.⁵

Congenital muscular torticollis appears to be more common on the right side; therefore, the right SCM causes the head to tilt toward the right and the face to turn up and toward the left (See Figure 2). The left SCM is now elongated and weak, causing a cervical scoliosis to appear with the convexity toward the left. The right upper trapezius and left splenius capitis muscles are often shortened, along with secondary shortening of the trunk muscles.

Immobility in the cervical area often leads to stiffness in the trunk and asymmetrical motor development; therefore, the acquisition of motor skills is often delayed by the presence of a torticollis posture. Factors such as muscle tone,



Fig 2 Child with right CMT. (From Oatis CA. *Kinesiology: The Mechanics & Pathomechanics of Human Movement*. 2004)

muscle imbalance, abnormal postural patterns, lack of cervical mobility, and secondary fascial restrictions are additional contributory factors leading to the delay of motor skills. Early motor skills that are often delayed include: turning the head toward the involved side, upper extremity

reaching on the involved side, weight-shifting of the trunk, rolling, prone propping on elbows, crawling, sitting, and transitional movements

In addition to the delayed acquisition of motor skills, the infant's postural reactions are often affected. Righting reactions develop during the first six months of life and are responsible for orienting the head to the horizontal, or restoring a body part to normal alignment following rotation of a body segment. Infants with CMT are typically unable to "right" the head laterally toward the uninvolved side and may over-react with "righting" the head toward the involved side. Protective reactions involve extension of the upper extremities in the same direction as the displacing force and are elicited when a child is suddenly and quickly pushed off his/her base of support. Due to impaired upper extremity reaching on the involved side, the child's protective reactions are often delayed. Equilibrium reactions incorporate rotational movements of the trunk and are designed to restore the center of mass over the base of support. Because the infant with CMT often acquires stiffness in the trunk musculature and lacks cervical mobility, these reactions again are typically diminished.

Differential Diagnosis:

While CMT is the most common cause of torticollis posturing, it is not the only cause. One in five children presenting with torticollis have a non-muscular etiology with either soft tissue or bony involvement.¹ Therefore, the importance of establishing an etiology for torticollis cannot be overemphasized. Many lesions can masquerade themselves as classical CMT, so the initial examination should include a thorough history and physical examination. The history will determine if the lesion is congenital or acquired, traumatic or non-traumatic in origin. The physical examination will determine whether there is an SCM muscle contracture, whether neck range of motion is limited, and if other health problems are present. If neck range of motion is restricted, an x-ray will reveal if congenital anomalies of the cervical spine are causing the torticollis posture. No treatment for restricted range of neck rotation should begin until an x-ray of the cervical spine is taken and an active search for the etiology of torticollis is complete.

Congenital torticollis may be due to malformations

of the cervical spine, which could include: C1-C2 articular anomalies, absence or laxity of the transverse ligament, Klippel-Feil syndrome, Sprengel's deformity, spina bifida, and absence or hypertrophy of cervical musculature.¹

Acquired torticollis can result from any disturbance to the muscles or bones of the skull and cervical spine, abnormalities in the brain or spinal cord areas related to head and neck posture, or any ocular disturbance. Causes of acquired torticollis include, but are not limited to: atlanto-axial rotatory dislocation, atlanto-axial subluxation, C2-C3 rotatory dislocation, infection or neoplasm of cervical spine, cervical spinal cord lesions, intracranial lesions (particularly in the posterior fossa), and peripheral nerve lesions involving cranial nerve XI.¹

Treatment:

Conservative treatment of CMT includes physical therapy emphasizing management of muscle hypoextensibility, strengthening exercises for the head and trunk, positioning and handling instructions, and postural education. The parent(s) and/or guardian(s) are VITAL to the treatment of CMT and are provided a home program to ensure carryover on the days the therapist is not with the child.

Initially, the parent(s) and/or guardian(s) are taught stretching techniques for the involved SCM, upper trapezius, and trunk muscles. Strengthening of the head and trunk typically begins with active-assistive movements encouraging active head rotation to the involved side. The physical therapist will instruct the parent(s) and/or guardian(s) on therapeutic positioning and handling. The initial goal of positioning is to develop midline postural control such that the head is in line with the body, the body is straight, the head is not tilted toward nor rotated away from the involved side, the chin is tucked, the arms are forward and down so that the hands can come together, and the legs are relaxed and together with the hips flexed. Education and activities concerning postural control techniques to promote symmetry and balanced muscle activity will also be provided. And lastly, the physical therapist will provide exercises to encourage the development of motor milestones if the child displays any developmental asymmetry or delay in motor skill function.

The frequency and duration of treatment will

depend on the level of involvement and the age of the child. Often the child is seen twice a week in the clinic by a physical therapist. As adequate range of motion and strength are achieved and the parent(s) and/or guardian(s) become confident with the provided home-based exercises, the physical therapist will adjust the frequency of visits accordingly.

Outcomes:

If treatment is initiated for the child less than one year of age, conservative treatment of CMT is reported to be effective in greater than 80% of the cases.⁶ Therefore, it is important to recognize both the impact of this disorder on the growth and development of the child and the urgency for early intervention. The importance of a team approach to the management of CMT cannot be overstated. Parents and primary care physicians need to be aware of the condition to achieve early diagnosis, and physical therapists need to be contacted early to set up an effective therapy program. Thus, working as a team will tremendously increase the success rates for the treatment of a child with CMT.

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4. Coventry MB, Harris LE, Bianco AJ, Bulbulian AH. Congenital muscular torticollis (wryneck). *Postgrad Med*. 1960; 28:383-392.
5. Jones PG. *Torticollis in Infancy and Childhood*. Springfield, IL: Charles C Thomas; 1968.
6. Binder H, Eng GD, Gaiser JF, Koch B. Congenital muscular torticollis results of conservative management with long-term follow-up in 85 cases. *Arch Phys Med Rehab*. 1987; 68:222-225.



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NEWS *briefs*

OSPTA would like to thank Ms. Ashley Mlakar, DPT for her contribution to the newsletter.

The Pediatric Center is located at the OSPTA Waynesburg and Charleroi office. Day and evening hours are available.

OSPTA would like to remind everyone that home health visits can be performed through OSPTA@Home.

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