

TUBULAR ORTHOSIS FOR TORTICOLLIS (TOT):  
A NEW APPROACH TO THE CORRECTION OF HEAD TILT IN  
CONGENITAL MUSCULAR TORTICOLLIS

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ABSTRACT:

A number of cervical orthoses have been designed to augment the stretching exercises usually recommended as conservative therapy and/or post-operative support for children with congenital muscular torticollis. The majority of orthoses are passive in nature and many are awkward and heavy. The Tubular Orthosis for Torticollis was designed to overcome these disadvantages. It consists of a circle of soft PVC tubing doubled over and fastened posteriorly. Short, rigid tubes span the tubing anterior and posterior to the angle of the mandible on the affected side. The child moves away from the pressure that the rigid tubes exert on his head only when he holds his head in the undesirable tilted position. The child must actively correct his head posture toward the midline position in order to be comfortable. The TOT takes approximately thirty minutes to fabricate and fit, and is readily adjustable, lightweight, inexpensive and unobtrusive. A prospective randomized study comparing children treated with stretching exercises and TOT (n=6) and a control group treated with stretching exercises alone (n=4) showed a clinically significant difference in the amount of residual head tilt following six months of treatment. The TOT group had a mean improvement of 8.5 degrees, while the control group had a mean improvement of 3.9 degrees. An objective quantifiable method of measuring head tilt, using photographs and a digitization software program, was developed to evaluate and compare the two groups.

We hypothesize that TOT provides new data, and therefore a stimulus for change to the reflex systems. The child must actively correct his head posture to true normal in order to be comfortable. As the child is maintained in this new position for long periods of time, his nervous system receives extensive new data. This enables him to gradually "reset" his perception of the horizontal plane and thus attain proper head posture. This approach supports the active correction techniques advocated by most authors (5,12,13,14).

The Head Tilt Measurement developed for the TOT study provides a simple tool for clinicians to use in the ongoing evaluation of current treatment or the development of new treatments for CMT. Inter-observer error is minimized and progress can be measured accurately.

One disadvantage of the Head Tilt Measurement is that sitting in the corner seat tends to make the subject upset, and therefore difficult to photograph well. This would probably be true of any seat in which the child is not allowed to move freely, and is compensated for by taking a series of photographs and averaging the results of the acceptable photographs. The alternative of seating the child on the therapist's or the mother's lap was considered but rejected because of the difficulty of achieving consistent, reproducible positioning. It has been suggested that pelvic rather than thoracic support may be less upsetting to children while allowing them to adopt their habitual head posture. This will be the subject of a future study.

Although the study group was small, the clear difference between the outcome in the two groups suggests that TOT can decrease the amount of residual deformity when used in conjunction with conservative therapy. Continuous, dynamic feedback may allow the child to change his perception of the horizontal plane and thus achieve correction of head tilt. TOT is now in use for many patients with CMT at BCCH, and ongoing data, including follow-up data on the original study group, is being collected.