Muscular torticollis - functional and esthetic rehabilitation with an indigenously designed neck stabilizing appliance

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Muscular torticollis results from shortening or excessive contraction of the sternocleidomastoid muscle. The reported incidence varies between 0.4% and 1.9%, and it is the third most common musculoskeletal anomaly that affects children (after hip dislocation and club foot). A 23-year-old female patient suffering from congenital muscular torticollis reported to the Department of Prosthodontics, A.B. Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangalore. Applying an interdisciplinary approach involving a team comprising an oral and maxillofacial surgeon, a prosthodontist and a physiotherapist, we functionally and esthetically rehabilitated the patient.

Key words: Congenital muscular torticollis, interdisciplinary approach, rehabilitation

INTRODUCTION

The word *torticollis* is derived from the Latin words *tortus*, which means 'twisted', and *collum*, which means 'neck'. Although Alexander the Great suffered with it in the third century BC, it was not until 1641 that Isaac Minius attempted the first surgical correction. Medically, *torticollis* is defined as 'a contraction, often spasmodic in nature, of the muscles of the neck, chiefly those supplied by the spinal accessory nerve; the head is drawn to one side and usually rotated so that the chin points to the other side'.[1]

CASE REPORT

A 23-year-old female patient reported to the Department of Prosthodontics, A.B. Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangalore, with the chief complaint of a defect in the right side of her neck. Her medical history revealed that she had the defect since birth. On examination, no pain or tenderness was noticed on the skull or neck. The trachea was in the normal position with no difficulty in swallowing or speaking. The neck appeared short on the right side with the head tilted to the right side and the chin raised to the opposite side. The shoulder on the affected side was raised [Figure 1].

Based on the history and clinical findings, she was diagnosed to be a case of congenital muscular torticollis.

Treatment planning

The goal of the treatment of torticollis is to improve the cosmetic result as well as increase the range of motion of the neck.

An interdisciplinary approach involving a team comprising an oral and maxillofacial surgeon, a prosthodontist and a physiotherapist was planned.

Surgical management: Surgical release of the clavicular and sternal heads of the sternocleidomastoid muscle.

Prosthetic management: Designing of a splint to stabilize the head position and later gradually stretch the sternocleidomastoid muscle.

Physiotherapy: In conjoint with the prosthetic appliance, active physiotherapy was advocated to help increase the range of motion of the sternocleidomastoid muscle on the affected side of the neck.

Under general anesthesia, a transverse skin incision was made 2 cm above the clavicle of the affected side. After protecting the external jugular vein and dividing the platysma in line with the incision, a deep cervical fascia was entered and two heads (clavicular and sternal) of the sternocleidomastoid muscle were identified. The muscle heads were separated by a cautery. After separating the two heads of the sternocleidomastoid muscle, the patient's head was maneuvered from side to side to test the extent of the release.

An impression of the affected side of the neck was made using an irreversible hydrocolloid impression

Figure 1: Pretreatment photograph

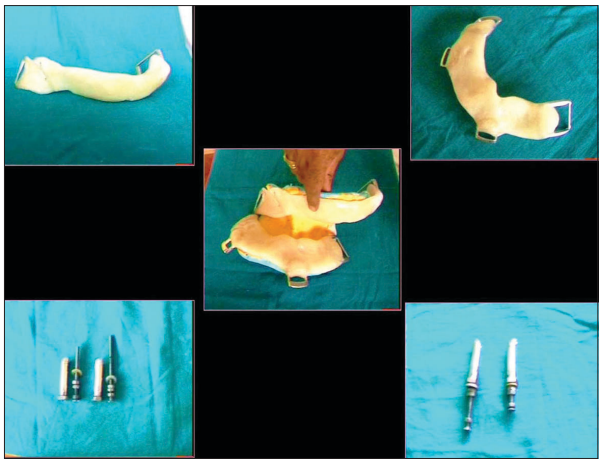

Figure 3: Parts of the appliance arranged

Figure 2: Impression made using irreversible hydrocolloid impression material reinforced with plaster

Figure 4: Patient wearing the appliance

material, which was reinforced with Type II gypsum product after placing a wet gauze [Figure 2]. Later, a working cast was poured in Type III gypsum product (dental stone).

An indigenously designed appliance was fabricated using heat polymerizing acrylic resin after a successful wax pattern trial. The appliance comprised two braces, *mandibular* and *clavicular braces.*

The *mandibular brace* extended from the occipital protuberance posteriorly, along the base of the mandible on the right side to cross the midline anteriorly. The *clavicular brace* was considerably more extensive, extending from the sternum in the midline, following a curved path over the rib cage on the right side, crossing the clavicle and trapezius muscle just medial to the ball and socket joint of the right shoulder; this extended up to the superior border of the scapula posteriorly.

The two braces were attached to each other using two nut and bolt assemblies [Figure 3]. The *lateral assembly* (6 mm, 3.5 mm) extended from the angle of the mandible to the lateral end of the clavicle. The

Figure 5: Posttreatment photograph

medial assembly (8 mm, 4.5 mm) extended from the mental foramina region of the *mandibular brace* to an area on the *clavicular brace* midway between the clavicle and sternum. The concept governing this design was that the activation of the two nut and bolt assemblies simultaneously, would result in a controlled and

systematic separation of the two braces.

Both the braces were retained in place using straps and buckles. The *mandibular brace* was held in place with a neck strap that extended from the anterior border of the brace, around the patients neck on the left side and just below the occipital bone posteriorly to attach to the posterior end of the brace. The *clavicular brace* was held in position using two straps, one of which extended from either end of the brace and around the left armpit. The second strap was strategically attached to the lateral borders of the brace at sites corresponding with the attachment of the two nut and bolt assemblies and embracing the right armpit [Figure 4].

The appliance was used initially as a postsurgical stabilization splint for a week. This was done to hold the sternocleidomastoid in its new relieved position and dissipate the effects of post surgical scar contracture. Thereafter, the apparatus was used as an activation appliance till the termination of the treatment. A regimen of activation by unscrewing one thread every second day was followed, which resulted in a separation of 1 mm. The patient was trained to perform the procedure on her own and was kept on a recall visit schedule of seven days.

Adjunct with the prosthodontic management, active physiotherapy was also conducted. To attain relaxation, all movements of the cervical spine were performed in a slow, relaxed passive manner. This was followed by sustained passive stretching of the affected sternocleidomastoid. The head was bent gradually in side flexion to the left, held there for some time and then rotated gradually to the right.

The patient showed gradual improvement in neck mobility and position. After five weeks of appliance activation and physiotherapy the patient was able to turn to the ipsilateral side and keep her head up to 80° upright position [Figure 5]. Flexibility of the sternocleidomastoid had also increased. After three months of therapy, sufficient functional and esthetic improvement of the affected side was observed.

DISCUSSION

Torticollis is a manifestation of illness, not a disease in itself, whereby its etiology and pathophysiology can be of a very wide range.[2] The differential diagnosis is extensive, with muscular torticollis being its most common form, which results from shortening or excessive contraction of the sternocleidomastoid muscle.[3]

If the patient reports in the early stage, a conservative approach in the form of manual stretching is all that would be necessary. In this particular case, the patient[4,5] was already 23 years old when she reported; hence, a surgical intervention was important. Postsurgically, a stabilization appliance was used to hold the sternocleidomastoid in its new relieved position and dissipate the effects of scar contracture in order to prevent a relapse. Later, the appliance was activated, which along with physiotherapy, was used to stretch the affected muscle to achieve adequate length.

A well-planned and coordinated team effort enabled us to functionally and esthetically rehabilitate the patient.

CONCLUSION

By an indigenously designed neck-stabilizing appliance, it was possible to economically yet effectively rehabilitate a 23-year-old female patient suffering from congenital muscular torticollis in the right side of the neck.

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