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CONGENITAL MUSCULAR TORTICOLLIS: MANAGEMENT AFTER INFANCY

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Summary

Background & Aim: Congenital Muscular Torticollis (CMT) is a postural deformity of head and neck detected at birth or shortly after birth. It primarily results from unilateral shortening of Sternocleidomastoid muscle (SCM). In neonates and infants, patient may be cured conservatively by physiotherapy but surgery is the treatment of choice for children and adolescents. There are various techniques of surgery. In this case series, we describe our preliminary experience of division of both sternal and clavicular head of SCM.

Patients and Methods: In the present retrospective case series, four patients were treated surgically with a follow up of 6 to 12 months. The cases were enrolled between Nov' 2005 to Oct' 2006 in Gonoshasthaya Nagar Hospital and different clinics of Dhaka city of Bangladesh. All the patients were treated surgically by transaction of both sternal and clavicular head of SCM under general anesthesia. Patients were discharged on following post-operative day with advice to do regular physiotherapy.

Results: **Patients age range from 3 to 15 years of which three were female and one male. SCM was shortened in all cases (2 on right side and 2 on left side). Three of them were female and one was male. There was no associated anomaly. Post operative period was uneventful and there was no complication. Results were evaluated clinically and comments of peers.**

Conclusion: Division of both sternal and clavicular head of SCM is easy and safe surgical technique for the treatment of CMT of children and adolescent.

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Introduction:

Congenital Muscular torticollis (CMT) is a postural deformity of head and neck detected at birth or shortly after birth, primarily resulting from unilateral fibrosis & shortening of the Sternocleidomastoid muscle[1-2] The shortening of Sternocleidomastoid muscle (SCM) results in traction of mastoid process toward the sternoclavicular joint[3]. The head is therefore rotated away from & tilted toward the involved sternocleidomastoid muscle. The condition is some times called 'Wryneck' or 'Twisted neck'. The incidence of CMT is one in every 300 live births [4]. Plagiocephaly may co-exist in 80-90% of children with CMT[1,5].

Though impairment of SMC function is the most frequent cause of CMT but torticollis could also be result from other underlying disorders. The exact pathophysiology and etiology of sternocleidomastoid impairment in CMT is still unknown.

Prominent theories related to cause of CMT are-

1. Injury of SCM during birth in breech delivery or large first born large babies - muscles stretched or pulled, may tear- bleeding and bruising – results in fibrosis and shortening of muscle [2, 4, 6]
2. Defect in development of SCM [7]
3. Abnormal fetal position or intra-uterine crowding [8, 9]
4. Soft tissue compression leading to compartment syndrome [6]

Torticollis may be classified [10, 11] as-

1. Osseous types –
   a. Occipito-cervical dysfunction
   b. Cervical vertebral dysfunction
      i. Klippel-feil syndrome
      ii. Congenital scoliosis
      iii. Hemivertebrae

2. Non osseous types-
   a. Congenital muscular torticollis
   b. Sandifer syndrome
3. Neurogenic types –
   a. Central nervous system tumors
   b. Arnold Chiari Malformations
   c. Ocular torticollis
   d. Paroxysmal torticollis

In CMT, patient's head remain tilted toward the involved side. Child and adolescents patient can't look forward. If the patient wants to look other sides he/she have to rotate whole body as he / she can't move neck. Gradually patient develops facial hemihypoplasia which results in flattening and under development of the malar eminence, downward displacement of the eye, ear and angle of mouth on the effected side. It also hampers the development of facial skeletons.

The characteristic position of head in CMT[7]:

1. Head is tilted toward the affected side.
2. Chin is turned away from the affected side.
3. Child looks away from the affected side.
4. Parents usually notice that the baby can't look in one particular direction.

Children with CMT can be assigned to one of three groups[1]:

1. Children with a palpable swelling or pseudotumor of the sternocleidomastoid,
2. Children with SCM tightness but no tumor,
3. Children with all features of muscular torticollis without muscle tightness or tumor.

History, physical examination & clinical progression can do the diagnosis but in some cases ocular, neurological evaluation and radiological investigation of cervical spine are necessary [12]. 69 to 91 % patient may cure conservatively with physiotherapy within one year of age [1, 13, 14]. Surgery is the treatment of choice for the patient with CMT persisting after one year of age [15]. There are various techniques of surgery –

1. Division of both sternal and clavicular heads of SCM [15].
2. Lengthening of tight SCM by unipolar release [1,5].
3. Lengthening of tight SCM by bipolar release[10].
4. Subperiosteal lengthening [16].
5. Endoscopic release [17].

Subperiosteal lengthening, lengthening of tight SCM by unipolar or bipolar release, etc techniques are difficult and there is chance of injury to accessory nerve injury. Endoscopic surgery is a high-tech surgery and needs sophisticated instruments. Division of both sternal and clavicular heads of SCM is easy and there is no chance of injury to any nerves or large vessels.

Patients and methods

Four cases of Congenital Muscular Torticollis (CMT) were operated from November 2005 to June 2006 in Gonoshasthaya Nagar Hospital and different private clinics of Dhaka city of Bangladesh. Patients were diagnosed clinically. All the patients present with short sternocleidomastoid muscle. There were no facial hemihypoplasia or any other associated abnormalities. Out of 4 patients, 3 were untreated on neonatal infantile period and failed physiotherapy was 1.

All of the patients were admitted to hospital. Under general anesthesia, an approximately 3 cm transverse curvilinear incision was made on skin crease line about 2-5 cm above and medial part of clavicle (Fig- 1) just over SCM.

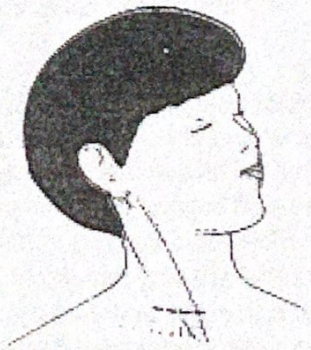

Fig – 1 : *Incision line to release SCM*

The platysma was divided. Subplatysmal flaps were developed along the SCM for 1-2 cm superiorly and to the level of clavicle inferiorly. The posterior aspect of the SCM was then dissected free from the underlying carotid sheath. The clavicular and sternal heads of SCM underlying investing cervical fascia, were divide at this level with by electrocautery (Fig- 2, 2a). Hemostasis was ensured.

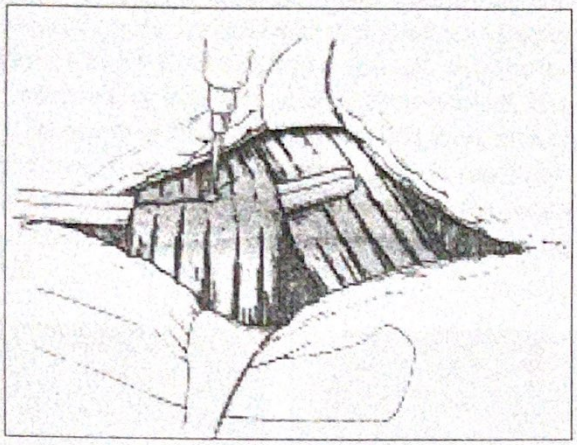

Fig – 2: *Division of SCM (diagram)*

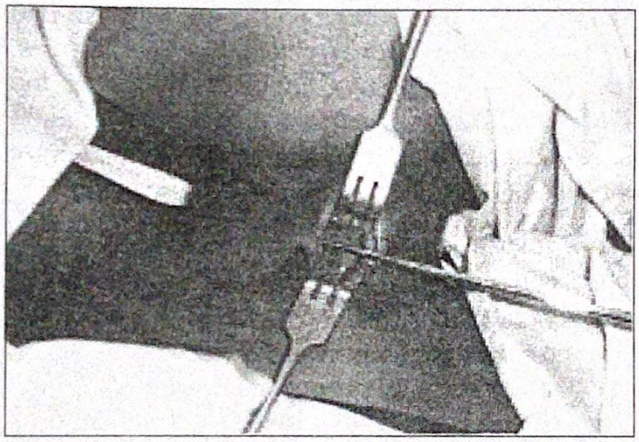

Fig – 2a *: Divsion of SCM (Photo)*

Transected ends of the muscle were than dissected free from the surrounding fascia and carotid sheath with caution (Fig- 3, 3a).

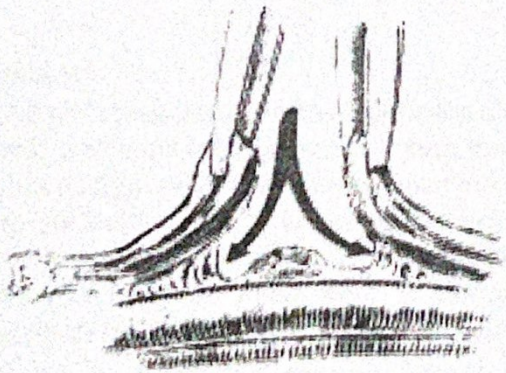

Fig -3 : *Transected ends of SCM*

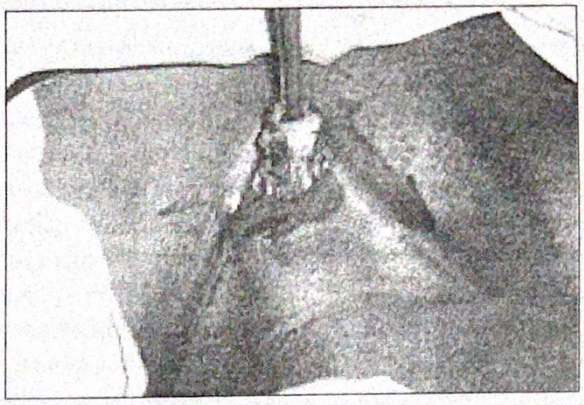

Fig -3a : *Dissection of Transected ends of SCM*

Surrounding cervical fascia was also released as they may contribute to contracture. Wound is than palpated to ensure that all contracted tissue is released. We don't divide the external jugular vein. After ensuring hemostasis, the wound was closed in layers. Post operative period was uneventful. The patients were maintained 30^0 up position for first 24 hours and than the patients allowed to go home and advised for physiotherapy. Follow up was given on 7^{th} Post operative day and after 3 and 6 months.

Results:

The age of the patients of the study rangeed from 3 years to 15 years. Three were female and one male. Two were on right side and two on left side. All of the patient have the history of vaginal delivery at home, two give the history prolong labour of which one is first born baby. None can give the history of breech delivery. Other two have the history of normal vaginal delivery (Table-I). None of the patient's mother can give proper antenatal history. There is no family history of torticollis in any patient. There were history of sternomastoid tumor on neck in two patients including the patient who had failed physiotherapy.

Table – I

Mode of birth of the studied patients

Mode of child born		No of Patients
Ceserian Section		0
Vaginal Delivery	Normal	2
	Difficult	2 (One first born baby)
First born baby		1

Results of operation were assessed subjectively by clinical evaluation, patient's response and critical analysis by peers. Over all result was excellent in respect of movement of head and neck and position of face. On 7th Post operative day, all the patients could move their head and neck as they wanted. There was no tilting of head and child could look forward. There were no complications. After 6 months all patients are look like a normal baby. There was no recurrence. Results of operation are shown in fig 4 and 5.

Fig-4 : *Preoperative CMT*

Fig-4a : *Post-operative CMT of fig- 4*

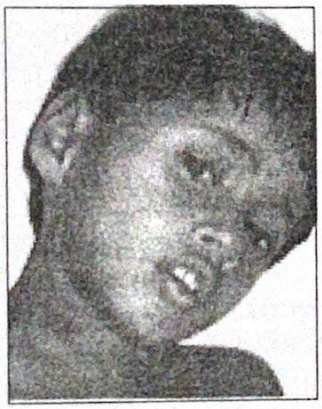

Fig-5 : *Preoperative CMT*

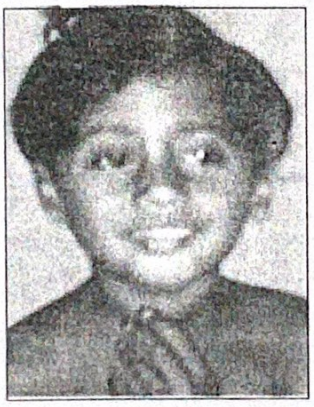

Fig-5a : *Post-operative CMT of fig- 5*

Discussion:

CMT patient's head always remain tilted to the affected side and they can't look forward or rotate the head and neck as they want. They have to move the whole body to see the side objects. Untreated cases develop mandibular hypoplasia, facial hemihypoplasia, skeletal deformity of face, etc which leads to permanent disfiguration. So CMT patients suffer both functional and cosmetic problems.Though in literature, the incidence of CMT is 1 in every 300 live births[4], still we have no data about CMT in Bangladesh.

The optimal management of CMT has been urged for many years. Most agree that physiotherapy is the mainstay of the treatment in minor children. Surgery is usually reserved for patients whose conditions were persistent beyond the age of one year or when cervical function and facial deformities are unacceptable[15]. There are various techniques of surgery of which division of both sternal and clavicular head of sternocleidomastoid muscle is easy and less time consuming. It can be done as a day case surgery. There is no chance of injury to the accessory nerve as it passes more superiorly[15]. External jugular vein can also be preserved as we done. Movement of the head and neck depends upon the synergistic and antagonistic activities of the different cervical muscles, such as splenius capitis, trapezius, platysma, the longus coli, the longus capitis, rectus capitis, etc. [18]. So, in absence of CMT in one side will not interfere with the movement of head and neck.

In our study, Right : Left side involvement was 1:1 which corresponds with the study of others[19]. There are records of family history of CMT in 3.6%[19] but we have no such finding which also corresponds with the study of others[20]. Our patients also have the history of sternomastoid tumors like others[6,12]. Facial asymmetry and plagiocephaly are common, though not invariable associated anomaly with CMT. Both believed to be secondary to the Torticollis. Reported co-existence of hip dysplasias with CMT varies from 0.6% to 20%[19] but we have no such condition or any other associated anomalies like others [20]. There was no wound infection or any other complications seen in this study. Though in reported literature recurrent torticollis is about 3% [21] but we have no such record.

Conclusion

Division of both sternal and clavicular heads of sternocleidomastoid muscle in case of persistent torticollis, beyond the age of one year is a safe and simple method of surgery with an excellent result in respect of movement of head and neck, position of head, appearance and comments of peers.

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