

Congenital muscular torticollis: Results of bipolar release in children older than 5 years

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Abstract:

Objective: The objective of this study was to know about the outcome of bipolar release of congenital muscular torticollis in children above 5-years.

Introduction: Congenital muscular torticollis is the 3rd most common musculo-skeletal anomaly after club foot and developmental dysplasia of hip. It is characterized by shortening of the sternocleidomastoid muscle leading to tilting of head towards and chin to the opposite side. Physical therapy yields excellent results when diagnosed early. Surgery is indicated for late presentation or those with residual deformity after physical therapy.

Material and Methods: It was a descriptive observational study utilizing consecutive non-probability sampling technique. Patients with congenital muscular torticollis and age above 05 years were included in the study. Bipolar release was performed in all and outcome was measured with scoring system of Lee et al.

Setting: The study was carried out at the Department of Orthopaedic and Spine Surgery, Hayatabad Medical Complex, Peshawar from September 2008 to January 2020.

Results: During the study period a total of 29-patients with Congenital Muscular Torticollis (CMT) underwent bipolar release of the SCM muscle. The mean age at surgery was 08.92 ± 2.20 years (range = 05-18 years). Out of 29-patients excellent or good results were noted in 23 (79.3%). A score of 17-18 points was achieved in 17-patients (58.6%) accounting to excellent results whereas 08-patients (27.6%) were graded as good (15-16 points). Fair outcome was noted in 3 patient (10.3%). One patient had poor result in the study.

Conclusion: Bipolar release of the sternocleidomastoid is a safe and effective method for treating Congenital Muscular Torticollis even in children older than 5 years. It has got few complications and it provides good cosmetic and functional results. It resolves the deformity and restores the neck range of motion.

Key words: Congenital muscular torticollis, outcome of bipolar release

Introduction:

The word torticollis is derived from two Latin words; 'tortus' meaning twisted and 'Colum' meaning neck.¹ Congenital muscular torticollis (CMT) is characterized by shortening and contracture of the sternocleidomastoid muscle, consequently the head is tilted towards the affected side while the face and chin rotates to the opposite side. There is also contracture of platysma muscle. The typical presentation is a palpable mass in the sternocleidomastoid muscle (SCM) on the affected side with characteristic

deformity.² It is the third most common musculoskeletal anomaly preceded only by congenital hip dislocation and clubfoot. The overall incidence of congenital muscular torticollis varies from 0.2% to 1.8% of all live births.³

The etiology of congenital muscular torticollis remains unknown. Several theories have been suggested including intra-uterine mal positioning, trauma during difficult delivery, venous congestion and compartment syndrome in the sternocleidomastoid muscle leading to fi-

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brosis and hence the characteristic deformity.⁵ Patients with congenital muscular torticollis can be classified into three clinical sub-groups. Group-1 is the ones with sternocleidomastoid muscle tumor; it consists of torticollis with a palpable pseudo tumor in the body of sternocleidomastoid muscle. This is a hard, movable mass within the substance of the sternocleidomastoid muscle noted at birth, usually located in the middle to lower 3rd of the sternal portion of sternocleidomastoid muscle. The pseudo tumor commonly increases in size after its first noted and then gradually resolves over a period of 6-24 months. This is the most common presentation and contributes to 28.2-47.2% of diagnosed cases of congenital muscular torticollis in infants, group-2, is muscular torticollis, consisting of torticollis with tightness of the sternocleidomastoid muscle, but no palpable tumor. The last group, group-3 is a postural torticollis without a mass or tightness of the sternocleidomastoid muscle.^{6,7} It is imperative to differentiate congenital muscular torticollis from other forms of congenital and acquired torticollis, this requires detailed workup including detailed physical examination and cervical spine radiographs.⁸

If diagnosed early on physical therapy in good hands can yields excellent results with good neck range of motion and no residual deformity. But the physiotherapy is prolonged and needs child and parents compliance. Surgery is indicated for neglected cases and those with residual deformity after physical therapy. The best time for surgery is considered to be between 01-04 years of age. Surgical outcome is less predictable after this age group owing to permanent craniofacial deformity.² There are different surgical techniques for treatment of congenital muscular torticollis these include bipolar release, unipolar release, subperiosteal lengthening and endoscopic release of the sternocleidomastoid muscle.⁴

Surgical outcome was considered predictable in relatively older children. In our country the parents bring their child late to the physician. In females the neglect is more alarming as they bring the girls in late teen age when they are

about to be engaged for wedding. Outcome of surgery before 5-years is predicable and good. But in older children the result of release are not very encouraging, as the facial asymmetry may persist. But even some improvement is greatly appreciated by the patients. As we have been doing these cases for the last many years, in this article we are presenting our results in patient older than 5-years. This study would add to the previous knowledge as well as help address the controversies of surgical treatment of congenital muscular torticollis in older age group. Late presentation of congenital muscular torticollis is a common occurrence in our society so the importance of this current study can not be overstated in this respect as well.

Material and Methods:

It was a descriptive observational study utilizing consecutive non-probability sampling technique. The study was carried out at the department of Orthopaedic and Spine Surgery, Hayatabad Medical Complex, Peshawar from September 2008 to January 2020. The study was conducted after approval from the departmental ethics committee. All the patients with congenital muscular torticollis fulfilling the inclusion criterion were included in the study. X-rays of the cervical spine were obtained in all patients to evaluate for any congenital anomalies of the cervical spine. Some times CT scan and MRI scan were also carried out. Careful neurological examination was performed to rule out any spastic paralytic lesions. Only patients with idiopathic congenital muscular torticollis with age above 5-years were included in this study. Patients with neurogenic torticollis and those with congenital cervical spine anomalies were excluded from the study. Pre-operative range of motion of the neck was documented in all patients.

Bipolar release was performed in all the patients under general anesthesia. Proximal incision was made behind the ear just distal to the tip of the mastoid process and the mastoid head of sternocleidomastoid muscle was released. Care was taken not to injure the cervical accessory nerve. A distal incision was made in line with the cervical skin creases one finger breadth proximal to

Table 1: Lee et al scoring system

Points	Neck movements	Head tilt	Scar	Loss of column	Lateral band	Facial asymmetry
3	Full	None	Fine	None	None	None
2	<10° LOR or side flexion	Mild	Slight	Slight	Slight	Slight
1	10-25° or side flexion	Moderate	Moderate	Obvious but cosmetically acceptable	Obvious but cosmetically acceptable	Moderate
0	>25° LOR or side flexion	Severe	Unacceptable	Unacceptable	Unacceptable	Severe

LOR: Limitation of rotation

Table 2: Patients demographics

Variable	Number	Percentage
Gender:		
Male	18	62%
Female	11	38%
Site:		
Right	18	62%
Left	11	38%

Table 3: Outcome using Lee et al scoring system

Score	Outcome	Number	Percentage
17-18	Excellent	17	58.6%
15-16	Good	08	27.6%
13-14	Fair	03	10.3%
<12	Poor	01	3.4%

the medial end of the clavicle and sternal notch. The clavicular head of sternocleidomastoid muscle was released while the sternal head was lengthened by Z-plasty. The required degree of correction was achieved by manipulating the head and neck during the release.

Post-operatively a custom made well fitting cervical collar was applied in all cases. Neck range of movement exercises were initiated at 6-weeks post-operatively followed by strengthening exercises. Patients were followed at 02 weeks, 06 weeks, 03 months, 06 months and finally at 12 months interval. At each follow-up visit, patients were assessed by evaluating the following parameters: Deficits of lateral flexion and rotation of the head, craniofacial asymmetry, surgical scarring, residual contracture and degree of head tilt. The neck movement and lateral band were compared with the uninvolved side and the head tilt and surgical scar were evaluated by clinical observation. The outcome of surgery was analyzed and graded according to the

scoring system of Lee et al. (see Table I) which graded the outcome as excellent (17-18 points), good (15-16 points), fair (13-14 points) or poor (less than 12 points) on the basis of both function and cosmetic results. The data was collected and analyzed using SPSS version 22.

Results:

During the study period a total of 29 patients with congenital muscular torticollis underwent bipolar release of the sternocleidomastoid muscle. The mean age at surgery was 08.92±2.20 years (range = 05-18 years).

18 patients (62%) were female and 11(38%) were male. Right side involvement was more 18(62%) as compared to 11(38%) of left side.

Facial asymmetry and neck tilt was noted in all patients. The Outcome was measured using Lee et al grading system. Out of 29-patients excellent or good results were noted in 23(79.3%). A score of 17-18 points was achieved in 17 patients (58.6%) accounting to excellent results whereas 08 patients (27.6%) were graded as good (15-16 points). Fair outcome was noted in 3 patients (10.3%). Similarly one patient had poor result in the study. There were no pre-operative or post-operative complications. The patient and parents were satisfied with results even in cases where our own grading was fair or poor. Two patients had hypertrophic scar formation at the sterna end; one of them needed scar revision later

Discussion:

If diagnosed early on congenital muscular torticollis responds very well to conservative treatment consisting of passive stretching of the muscle. Conservative treatment is the gold stan-

dard for congenital muscular torticollis in patients below 01 year of age. Surgical correction is recommended for late presentation or those in whom non-operative treatment is not successful.^{8,9} Among the different surgical techniques the bipolar release of sternocleidomastoid muscle is a commonly employed one. In comparison to traditional surgical techniques relatively new treatment modalities such as endoscopic release has been increasingly used in dealing with congenital muscular torticollis.¹⁰ More recently Castro et al reported the use of harmonic scalpel for bipolar release of congenital muscular torticollis in a 35-year old women. They reported good cosmetic and functional results.¹¹

The bipolar release of sternocleidomastoid muscle as described by Ferkel et al., comprises of cutting the clavicular and mastoid attachments of the muscle and in addition performing Z-plasty of its sternal head. This procedure yields excellent results. Ferkel et al., in their original series documented 92% excellent/good results.¹² The effectiveness of bipolar release for congenital muscular torticollis is well documented in 01-04 years of age and this is considered the best time for surgery.² The surgical outcome is less predictable in relatively older children so we selected the age group ranging from 05-12 years old. Even though the outcome of surgical release for congenital muscular torticollis has been documented in elderly patients, the age group that we selected has not been well studied in isolation. It is postulated that surgical outcome is less predictable above 5-years of age since permanent craniofacial changes sets in with growing age.² Seyhan et al studied the late presentation of congenital muscular torticollis between the age groups of 6 and 23 years. Their results showed significant improvement in neck range of motion and head tilt after bipolar release for congenital muscular torticollis. They commented that surgical intervention is beneficial even above the age of 5-years, which is similar to our observation and recommendation.¹³

In our present study excellent/good results were obtained in 86.2% of patients which is similar to our previous study although relatively

older patients were also included in our present study.²¹ Our good to excellent outcome is lower than in the study by Ferkel et al (92%) but better than Kamboh UA et al., with around 79% good to excellent results.^{12,20} We believe that the relatively older age group in our study could be the contributing factor towards the lower excellent/good results. Lee et al., studied changes of craniofacial deformity after surgical release for congenital muscular torticollis. They concluded that the results of surgery are better when it was performed before 5-years of age.¹⁴ In another study the authors assessed the surgical outcome of congenital muscular torticollis in patients older than 8-years by dividing them into two groups; firstly those who were in growing phase and the other who had completed their growth at surgery. The results were statistically better in the first group who were still in growing phase.¹⁵ All of this evidence further emphasizes the importance of early recognition and timely intervention in congenital muscular torticollis. However late presentation of congenital muscular torticollis is common place in our set up so the current study helps address this issue as well. Ling and Low had previously stated that surgical release is of little value in older age group and results are even worse if done after puberty with higher complication rate as well. More recent evidence is of the contrary view as Lim et al reported that surgical release was beneficial for the treatment of neglected congenital muscular torticollis in adults and was not associated with any serious complications, furthermore surgical treatment leads to cosmetic and functional improvements and relieved pain originating from the muscle imbalance brought about by the long-standing deformity.^{2,16} Furthermore 86% excellent/good results have been reported with bipolar release in skeletally mature patients with neglected congenital muscular torticollis.¹⁶ Sudesh et al reported 14-patients older than 10-years of age with neglected congenital muscular torticollis who underwent surgical release and showed 71% excellent/good results.¹⁷ Permanent craniofacial changes does alter the results of surgical release for congenital muscular torticollis but the above data suggests that pa-

tients with neglected congenital muscular torticollis can still benefit significantly from surgery. Arslan et al,¹⁸ reported the use of frontal cephalometric analysis for assessment of facial asymmetry in bipolar release of patient above 6-years of age. They concluded that patients even above 6-years of age can benefit from bipolar release.¹⁸

Conclusion:

Bipolar release of the sternocleidomastoid is a safe and effective method for treating congenital muscular torticollis even in relatively older child. It has got few complications and it provides good cosmetic and functional results. It resolves the deformity and restores the neck range of motion.

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Role and contribution of authors:

Israr Ahmad, collected the data, references and wrote the article.

Wasim Anwar, collected the data, references and helped in introduction writing.

Noor Rahman; collected the data and helped in discussion writing.

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Mohammad Arif Khan. critically review the article and make the final changes.

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