

Original Research Article

Management of neglected cases of congenital muscular torticollis with bipolar release

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ABSTRACT

Background: Congenital muscular torticollis (CMT) is the third most common congenital musculoskeletal anomaly in children. After the age of one year functional and cosmetic benefits require corrective surgery. Neglected congenital torticollis is commoner in developing countries. The purpose of this study was to evaluate the results of bipolar release in this age group.

Methods: 16 cases were operated on for neglected congenital muscular torticollis. Inclusion criteria included age of more than ten years, absence of any previous surgery, and absence of any known pathology. Inferior release was done through an incision 1 cm above the medial third of the clavicle. The clavicular head was released completely while the sternal head was lengthened by z-plasty. The mastoid head was released through an incision just below the tip of the mastoid process. The postoperative management included physiotherapy with halter traction. Neck ROM, head tilt, craniofacial asymmetry were assessed.

Results: Excellent results were noted in four patients, good in eight, fair in two, and poor in two.

Conclusions: We believe that bipolar release is a very viable option for correcting neglected CMT as it brought about both functional improvement as well as improvement in cosmesis, resulting in improved quality of life.

Keywords: Congenital muscular torticollis, Case series, Congenital

INTRODUCTION

Congenital muscular torticollis (CMT) is the third most common congenital musculoskeletal anomaly in children after dislocation of the hip and clubfoot.¹ The incidence in males is higher with a ratio of 3:2. The right side has a higher preponderance than the left.^{2,3} Patients present with tilting of head towards the affected side due to shortening and fibrosis of the sternocleidomastoid. Prolonged head tilt can lead to plagiocephaly.⁴ In cases below the age of one-year conservative management can lead to good results, but after the age of one year functional and cosmetic benefits require corrective surgery. Neglected congenital torticollis is commoner in developing countries compared to developed countries.

And many patients do present after 10 years of age. The purpose of this study was to evaluate the results of bipolar release in this age group.

METHODS

16 cases were operated for neglected congenital muscular torticollis. The complete study period extended over a duration of 8 years i.e. from 2005 to 2013 (including the follow-up period). The multicenter study included patients presenting in hospitals in Bhubaneswar, Cuttack and Burla. Inclusion criteria included age of more than ten years, absence of any previous surgery, and absence of any known pathology that could have been the cause of the torticollis. Preoperative assessment was done for

restriction of neck movements, head tilt and facial asymmetry, as per the scoring system of Lee et al.⁵ Bipolar release was performed (i.e., release of both the inferior and the superior head) in all cases as shown in Figure 1. Inferior release was done through an incision 1 cm above the the medial third of the clavicle. The clavicular head was released completely while the sternal head was lengthened by z-plasty as given in Figure 2. The mastoid head was released though an incision just below the tip of the mastoid process as shown in Figure 3. Fascial sheaths were released, taking due precaution not to injure any neurovascular structure. The postoperative management included physiotherapy with halter traction for 3 weeks along with passive & active

movements as seen in Figure 4. After three weeks, the patients were put on cervical collar and halter traction was limited to night time use as in Figure 5. Patients were reviewed every month for three months, bi-monthly for one year, and thereafter every six months. Neck range of movement (ROM), head tilt, craniofacial asymmetry were assessed, postoperative complications (if any) were recorded as given in Figure 6 and 7. A scoring system modified from Lee et al, which included function and cosmetic results, was used.⁵ An excellent result corresponded to 17–18 points; a good result to 15–16 points; a fair result to 13–14 points; and a poor result to less than 12 points.

Table 1: Scoring system for assessment of congenital muscular torticollis; modified from Lee et al.

Points	Neck movement	Head tilt	Scar	Loss of column	Lateral band	Facial asymmetry
3	full	None	Fine	none	none	none
2	<10°	Mild	Slight	slight	slight	slight
1	10°-25°	Moderate	Moderate	obvious	obvious	moderate
0	>25°	Severe	Unacceptable	unacceptable	unacceptable	severe



Figure 1: Bipolar release was performed (i.e., release of both the inferior and the superior head) in all cases.



Figure 3: The mastoid head was released though an incision just below the tip of the mastoid process.



Figure 2: The clavicular head was released completely while the sternal head was lengthened by z-plasty.



Figure 4: The postoperative management included physiotherapy with halter traction for 3 weeks.



Figure 5: After three weeks the patients were put on cervical collar.



Figure 6: Post operative X-ray 3 months later.



Figure 7: (ROM), head tilt, craniofacial asymmetry were assessed.

RESULTS

The age of presentation varied from 10-19 years. 12 were male and 4 were females. The average age of presentation was 13.8 years. 12 of the patients had involvement of the right side, while the rest had involvement of the left side. The mean follow-up for the patients was around three years (range 1–6 years). Excellent results were noted in four patients, good in eight, fair in two, and poor in two. No post-operative complications were found in any of the

16 patients. Postoperatively there was improvement in the functional range of movement in all patients. Restriction of movement was 10–25 in only two patients. Others had acceptable or almost normal range of movements. Reduction in head tilt and chin deviation was present in all patients. Postoperative all patients had acceptable levels of head tilt as well as cosmetically acceptable scars. Post operatively improvements were also seen in head tilt and facial asymmetry.

Table 2: Results after scoring as per Lee et al system in patients participated in the study.

S. no	Age	Sex	Side	Result	Score
1	12	M	R	Excellent	17
2	13	M	R	Excellent	17
3	16	F	L	Good	16
4	11	M	R	Poor	11
5	13	F	R	Good	16
6	14	M	R	Excellent	18
7	14	M	L	Excellent	18
8	14	M	R	Good	16
9	15	M	R	Good	15
10	16	M	R	Good	15
11	11	M	L	Poor	12
12	14	F	R	Good	15
13	13	F	R	Fair	14
14	11	M	R	Fair	13
15	18	M	R	Good	16
16	16	M	L	Good	16

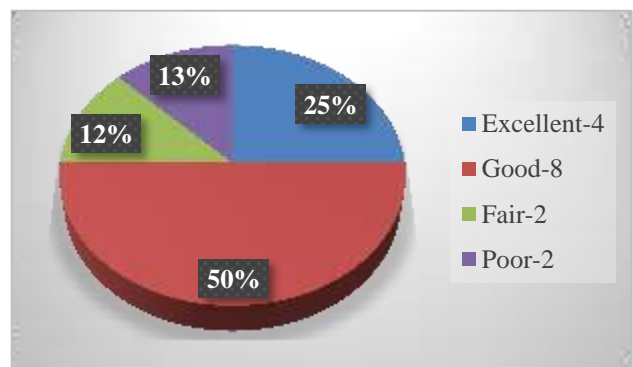


Figure 8: Results after scoring as per Lee et al system.

DISCUSSION

Most cases of CMT resolve completely, either spontaneously within months after birth or following the early initiation of conservative measures such as gentle controlled passive manual stretching exercises.^{2,3} Conservative management is generally successful before the age of 1 year. Reversal of facial asymmetry after four years of age is difficult. Characteristically, there is flattening of the occiput contralaterally and depression of the ipsilateral malar prominence, with downward displacement of the ear, eye and mouth on the affected side. Surgery done when the patient is skeletally

immature may result in better improvement in deformities.^{3,6} But in the Indian scenario later presentation is quite common due to ignorance as well as the lower socio-economic status. Coventry and Harris reported that the upper limit for good results after surgery for muscular torticollis is twelve years. Ling reported that age to be five, and that the complication rate is high. Our procedures of bipolar release with z-plasty resulted in good response in patients treated late but only with optimum surgery and very strict adherence to post-operative physiotherapy.⁵⁻⁷ Unipolar and bipolar release are the most popular surgical procedures employed for CMT. We decided not to risk injuring the spinal accessory nerve with total resection of the sternocleidomastoid muscle.

Wirth et al recommended that biterminal release should be performed at the age of 3–5 years in all patients who do not respond to nonoperative treatment and that bipolar release combined with z-plasty preserves the normal V contour of the sternocleidomastoid and ensures a better cosmetic outcome.⁸ We carried out the same procedure.

Post operatively we used halter traction initially to make sure that the released structures do not return to their former tightness. After 3 weeks the patient was shifted to soft cervical collar and range of motion exercises were started. A very strict adherence to post-operative physiotherapy was maintained. Facial asymmetry was improved in most of the patients as did the range of motion.

Table 3: Comparative surgical outcomes of neglected congenital muscular torticollis in adults.

S. no	Study	No of patients		Method	Scoring system	Result
1	Seyhan et al	11	14.6	Bipolar	Neck ROM	All had satisfactory ROM
2	Current study	16	14.2	Bipolar	Modified Lee score	Excellent 4, good 8, fair 2, poor 2

CONCLUSION

We believe that bipolar release is a very viable option for correcting neglected congenital muscular torticollis as it brought about both functional improvement as well as improvement in cosmesis, resulting in improved quality of life. The procedure is relatively complication-free and safe when compared to total resection of the sternocleidomastoid muscle. Lengthening of the sternal head by z-plasty restores the V shape of the base of the neck, which adds to the cosmesis, especially in a female patient. Postoperatively a well-planned physiotherapy protocol ensures good to excellent results.

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Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Jones CD, Nakhdehvari A, Lidder S. Surgical management of idiopathic torticollis secondary to a fibrotic band. *Ortho Rev.* 2012;4:27.
2. Sudesh P, Bali K, Mootha AK, Dhillon MS. Results of bipolar release in the treatment of congenital

- muscular torticollis in patients older than 10 years of age. *J Child Orthop.* 2010;4:227–32.
3. Ballock RT, Song KM. The prevalence of nonmuscular causes of torticollis in children. *J Pediatr Orthop.* 1996;16:500–4.
4. Canale ST, Griffin DW, Hubbard CN. Congenital muscular torticollis: a long-term follow-up. *J Bone Joint Surg Am.* 1982;64:810–6.
5. Lim KS, Shim JS, Lee YS. Is Sternocleidomastoid Muscle Release Effective in Adults with Neglected Congenital Muscular Torticollis? *Clin Orthop Relat Res.* 201;472:1271–8.
6. Cheng JC, Tang SP. Outcome of surgical treatment of congenital muscular torticollis. *Clin Orthop Relat Res.* 1999;362:190–200.
7. Ling CM. The influence of age on the results of open sternomastoid tenotomy in muscular torticollis. *Clin Orthop Relat Res.* 1976;116(5):142–8.
8. Oh I, Nowacek CJ. Surgical release of congenital torticollis in adults. *Clin Orthop Relat Res.* 1978;131:141–5.

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