

*Case Report***CONGENITAL MUSCULAR TORTICOLLIS TREATED WITH UNIPOLAR RELEASE: A CASE REPORT**Tan Margaretha Heidina Handoko¹, & Gina Yunita Joice Sitorus²

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ABSTRACT

Introduction: Congenital muscular torticollis (CMT) is a common neck deformity involving sternocleidomastoid muscle shortening that causes head tilt. Most cases respond well to early conservative treatment in infancy, but older patients usually require surgery. Data on CMT in older patients are limited; therefore, optimal surgical treatment remains controversial.

Method: This study was a retrospective case report of a 9-year-old patient with CMT who underwent unipolar release of the SCM in 2023. This case report is based on medical and surgical records.

Results: Four months after unipolar release of the SCM and post-surgery treatment with a cervical collar, we observed significant improvement in the patient's neck range of motion and head tilt. The cosmetic result of the scar was also satisfactory.

Conclusion: CMT is a frequent clinical condition, but it is often underdiagnosed and referred for evaluation at a later stage. Early diagnosis and intervention are critical to achieve complete and rapid resolution. However, if surgery is needed, unipolar tenotomy of the distal SCM may be a good option that gives good results in uncomplicated cases of CMT alongside adequate post-operative treatments, including a cast and physiotherapy.

Keywords: Torticollis; Congenital muscular torticollis; Unipolar release; Treatment; Surgery; Tenotomy

Pendahuluan: Congenital muscular torticollis (CMT) merupakan deformitas leher yang umum terjadi akibat pemendekan otot sternokleidomastoideus (sternocleidomastoid muscle, SCM), yang menyebabkan kemiringan kepala. Sebagian besar kasus memberikan respons yang baik terhadap terapi konservatif dini pada masa bayi, sedangkan pasien yang lebih tua umumnya memerlukan tindakan pembedahan. Data mengenai CMT pada pasien usia lebih tua masih terbatas, sehingga pendekatan pembedahan yang optimal pada kelompok pasien ini masih menjadi perdebatan.

Metode: Penelitian ini merupakan laporan kasus retrospektif pada seorang pasien berusia 9 tahun dengan CMT yang menjalani tindakan pelepasan otot SCM unipolar pada tahun 2023. Laporan kasus ini disusun berdasarkan rekam medis dan catatan tindakan pembedahan pasien.

Hasil: Empat bulan setelah tindakan pelepasan unipolar otot SCM dan penggunaan penyangga leher (cervical collar) pascaoperasi, ditemukan perbaikan bermakna pada rentang gerak leher dan kemiringan kepala pasien. Hasil kosmetik pada jaringan parut juga dinilai memuaskan.

Kesimpulan: CMT merupakan kondisi klinis yang sering ditemukan, tetapi kerap tidak terdiagnosis dan baru dirujuk untuk evaluasi pada tahap lanjut. Diagnosis dan intervensi dini sangat penting untuk mencapai resolusi yang optimal dalam waktu yang lebih singkat. Namun, apabila tindakan pembedahan diperlukan, tenotomi unipolar pada bagian distal otot SCM dapat menjadi pilihan yang memberikan hasil baik pada kasus CMT tanpa komplikasi, disertai perawatan pascaoperasi yang memadai, termasuk imobilisasi menggunakan gips dan fisioterapi.

Kata Kunci: Tortikolis; Tortikolis Muskular Kongenital; Pelepasan Unipolar; Terapi; Pembedahan; Tenotomi.

Conflicts of Interest Statement:

The author(s) listed in this manuscript declare the absence of any conflict of interest on the subject matter or materials discussed.

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INTRODUCTION

Torticollis is derived from Latin and means twisted neck.¹ Congenital Muscular Torticollis (CMT) refers to a neck deformity involving sternocleidomastoid muscle (SCM) shortening that causes the patient's head to turn toward the affected unilateral side, with the chin pointing contralaterally.² CMT is a congenital malformation, ranking third as the most common congenital musculoskeletal anomaly after hip dislocation and clubfoot. Torticollis can be due to malposition of the fetus *in utero*, birth trauma, infection, and vascular injury, or it can be sequelae of an intrauterine or perinatal compartment syndrome.¹

When diagnosed early, physiotherapy can successfully manage torticollis. This conservative measure should be initiated early and consists of therapy such as gentle, controlled passive manual stretching exercises on the affected side.¹ If left uncorrected, torticollis can cause SCM tightness, limited neck motion, head tilt, and craniofacial asymmetry. These cosmetic and functional problems can adversely affect patients in adolescence and adulthood.³ Surgery is indicated for patients who failed physiotherapy. The optimal time for surgery is between 1 and 4 years,

because most children treated before age 1 respond well to conservative treatment.⁴

As many cases are successfully treated in infancy, CMT is rarely reported in older children, adolescents, or adults. Therefore, optimal surgical treatment for these groups remains controversial. Surgical approaches include unipolar SCM release, bipolar SCM release with or without Z-plasty, selective denervation, and dorsal cord stimulation.³ This paper aimed to describe our experience utilising unipolar tenotomy in a case of a 9-year-old boy with CMT.

PATIENT AND METHOD

A 9-year-old boy presented to the clinic with a wry neck, first noticed by his parents in infancy. He has never undergone any treatment or physical therapy. An AP and lateral view X-ray of the cervical spine was done before the surgery and showed no signs of any bone involvement. The cervicomandibular angle (CMA) was 25°, calculated using radiological head tilt as the angle between the inferior margin of the mandible and a line across the upper margin of the C7 vertebral body.



Figure 1. Pre-operative photograph of a 9-year-old boy with uncorrected CMT.



Figure 2. Pre-operative AP and lateral view X-ray of the cervical spine.

The surgery was done in October 2023. The patient was positioned supine with the head rotated to the left, opposite the torticollis. A 4-5 cm incision was made at the medial end of the clavicle, and the lower end of the SCM muscle was then identified. We released the tight band and tendons of the sternal and clavicular branches using electrocautery near their insertion on the clavicle. The incision was then closed. We initially planned to perform bipolar tenotomy, hence the dual incision sites. However, after the

neck range of motion was assessed, we managed to obtain favourable neck motion with only unipolar tenotomy, so we did not proceed with the second incision. The neck was immobilised using a cervical collar for 2-4 weeks to provide support during recovery time after the surgery. Physical rehabilitation was performed to support active and passive neck rotation and flexion. The parents were instructed to keep the patient's neck upright when not wearing the cervical collar.



Figure 3. Intra-operative photograph showing the initial design in the left picture and favourable neck motion after unipolar tenotomy in the right picture.

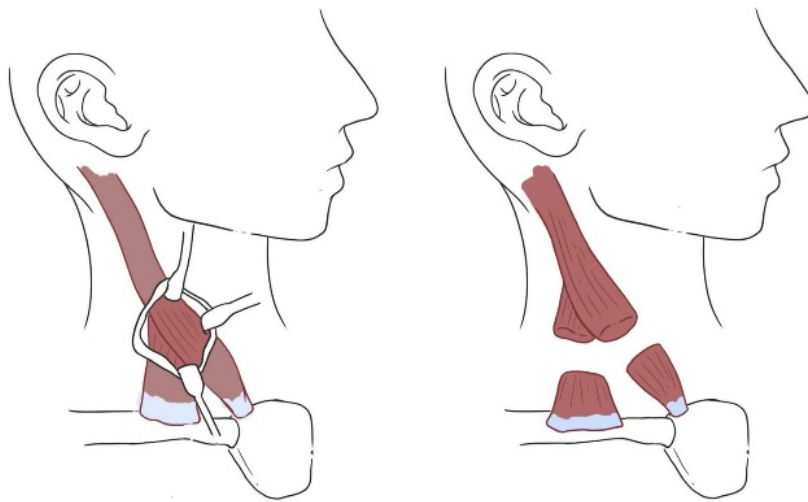


Figure 4. Illustrative design of unilateral tenotomy.

The patient was followed up 4 months after the surgery. We assessed outcomes using the modified Lee's criteria adapted from Kamboh et al. (2022), a system based on subjective evaluation

of functional and cosmetic outcomes. The maximum score is 12, categorised as follows: excellent (11-12 points); good (9-10 points); and fair (less than 9 points).



Figure 5. Post-operative photograph of the patient using a cervical collar.



Figure 6. Post-operative photograph taken 4 months after surgical release showing neck range of motion.

Table 1. Scoring system for the assessment of CMT; modified from Kamboh et al (2022)¹

Points	Head tilt	Scar	Loss of column	Lateral band
3	None (0-25%)	Fine	None	None
2	Mild (26-50%)	Slight	Slight	Slight
1	Moderate (51-75%)	Moderate	Obvious but cosmetically acceptable	Obvious but cosmetically acceptable
0	Severe (76-100%)	Unacceptable	Unacceptable	Unacceptable

These scores were evaluated by clinical observation. No limitation in cervical spine rotation was found during the physical examination. This patient had no post-operative

head tilt (3 points); the scar was fine (3 points); and no loss of column or lateral band was found (3 points each), for an excellent total of 12 points.

RESULTS AND DISCUSSION

Early diagnosis of CMT is important, because most CMT cases may resolve completely when conservative treatments are initiated early. The diagnosis is mainly based on history taking and physical examination findings. Further examinations may help confirm a muscular origin; for example, plain radiographs of the cervical spine may identify other congenital bone abnormalities. Surgical intervention should be considered the treatment of choice in older patients to avoid further irreversible changes. Other indications for surgery include a patient who has undergone at least 6 months of conservative treatment and has a residual head tilt, passive rotation deficit, or lateral bending greater than 15° at age 6 months.⁵

Surgical treatment for muscular torticollis aims to address residual facial asymmetry, head tilt, and limited neck motion. Tenotomy is one such procedure. Unilateral tenotomy of the sternocleidomastoid muscle releases only the lower end of the sternocleidomastoid muscle. During the procedure, sternal and clavicular tendons are also released, while the fibrotic band restricting rotation is divided, including the deep cervical fascia. Bipolar tenotomy releases the lower and upper ends of the sternocleidomastoid muscle.⁶ The tightness of the SCM is the factor that determines the choice of unipolar or bipolar release. Unipolar release is viewed as appropriate for early childhood and mild deformity, whilst bipolar release may be indicated for older patients and more severe deformity.³

Chen and Ko recommended bipolar release as the treatment of choice for CMT in patients

older than 6 years⁷, but other authors preferred to perform a distal release for patients older than 6 years⁸. Lim et al. reported that the site of the release was determined intra-operatively in order to lower surgical morbidity in older children and adults; bipolar release was used when manipulation was unable to provide sufficient correction following unipolar release⁹. We opted for bipolar tenotomy at first. After releasing the lower end of the SCM muscle, we assessed neck range of motion during the operation and obtained favourable neck motion with unipolar tenotomy alone.

Although usually performed in infancy, late release could provide excellent results. According to Kubo et al., good outcomes were achieved in more than 80% of patients who were 6 years or older treated with unipolar tenotomy.¹⁰ Following tenotomy, however, scar tissue may shorten the gap between the divided muscle ends and contractures may recur in many patients. Therefore, it is important to maintain the corrected position for a certain period after tenotomy, for example with a plaster cast or halter traction.^{4,6} However, good prognosis may be expected after unipolar tenotomy in both young and older children when the post-operative therapy is sufficient. In this case, the patient wore a cervical collar for up to 4 weeks and underwent physical rehabilitation to support active and passive neck rotation and flexion. After surgery and treatment, we assessed the patient's function and cosmetic results. No facial asymmetry was noted at any time, but we observed significant improvement in neck range of motion and head tilt, and the postoperative scar was also good. The patient and his family were satisfied with the results.

Bipolar tenotomy has a lower recurrence rate, but in cases where adequate neck range of motion has been achieved by only distal release of the SCM, then unipolar tenotomy may be a good option alongside adequate post-surgery treatments like a cast and physiotherapy. We suggest that unipolar tenotomy may be a good surgical approach for uncomplicated CMT cases like ours. This technique provided satisfactory function and cosmetic results. Intra-operative assessment of neck range of motion is important to determine whether further release is required.

CONCLUSION

CMT is a frequent clinical condition, but it is often underdiagnosed and referred for

evaluation at a later stage. Early diagnosis and intervention are critical to achieve complete, rapid resolution. However, if surgery is needed, unipolar tenotomy of the distal SCM may be a good option that gives good results in uncomplicated cases of CMT alongside adequate post-operative treatments, including a cast and physiotherapy.

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CONSENT FOR PUBLICATION

Written informed consent was obtained from the patient for publication of this case report and the accompanying clinical photographs.

ETHICAL APPROVAL

Ethics committee approval was not required for this case report under institutional policy.

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DECLARATION OF GENERATIVE AI USE

The authors declare that no generative artificial intelligence (AI) tools were used in the preparation, writing, or revision of this manuscript.

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