



Comparison of 2 Operative Methods for Treating Laterocollis and Torticollis Subtypes of Spasmodic Torticollis: Follow-Up of 121 Cases

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■ **OBJECTIVE:** The aim of this study was to compare the effects and complications of microvascular decompression (MVD) and neurectomy of spinal accessory nerve in the treatment of laterocollis and torticollis subtypes spasmodic torticollis (ST).

■ **METHODS:** Clinical data were retrospectively collected from 121 patients with laterocollis and torticollis subtypes of ST from January 1, 2012 to January 1, 2016. Among all the patients, 80 were treated by MVD and 41 were treated by neurectomy of spinal accessory nerve. The effect of the surgery was evaluated by the reduction in the Toronto Western spasmodic torticollis rating scale total scores before and after the operation. The mean duration of the postoperative follow-up period was 18.7 months (range, 12–27 months).

■ **RESULTS:** At the final follow-up, the Toronto Western spasmodic torticollis rating scale total score in the MVD group and in the neurectomy group was lowered by $50.43\% \pm 20.3\%$ and $30.23\% \pm 19.4\%$, respectively, compared with the preoperative status ($P < 0.05$). In the MVD group, 25 (31.25%) patients achieved excellent relief, 44 (55%) patients improved moderate spasm, and 11 (13.75%) showed no relief. In the neurectomy group, 6 (14.63%) patients improved with excellent outcome, 7 (17.07%) had moderate relief, and 28 (68.29%) had no relief. There was no mortality or severe complication postoperatively, with the exception of hoarseness, shoulder numbness, and weakness.

■ **CONCLUSIONS:** MVD for ST of laterocollis and torticollis subtypes can provide satisfactory and lasting

improvements without nerve impairment. MVD is to be preferred to neurectomy of accessory nerve in treating ST of laterocollis and torticollis subtypes.

INTRODUCTION

Spasmodic torticollis (ST), also called cervical dystonia, is a tonic and clonic neuromuscular disorder characterized by continuous or intermittent involuntary spasm of the cervical musculature. It starts gradually with pulling and drawing sensations and followed by abnormal head and shoulder movements with pain and tremor after months or years. It impairs daily activity and decreases the quality of life.¹

From January 1, 2012 to January 1, 2016, 121 ST patients with laterocollis and horizontal torticollis were treated by neurectomy of spinal accessory nerve or microvascular decompression (MVD) at Shanghai TongRen Hospital and Shanghai Xinhua Hospital. The clinical data were retrospectively reviewed. The aim of this study was to compare the effects and complications of MVD and neurectomy of spinal accessory nerve in the treatment of laterocollis and torticollis subtypes ST.

METHODS

Study Design

There were 45 men and 76 women. The mean age of the patients was 56.2 years old (range, 33–75 years). Median duration of symptoms was 6.6 years (range, 0.5–20 years). Twenty-eight patients had right horizontal torticollis, 32 had left horizontal torticollis, and 61 patients had laterocollis.

At the early stages of the disease, all the patients had been treated with physical therapy, 85.12% of patients received

Key words

- Cervical dystonia
- Microvascular decompression
- Spasmodic torticollis
- TWSTRS

Abbreviations and Acronyms

- CN:** Cranial nerve
- MRI:** Magnetic resonance imaging
- MVD:** Microvascular decompression
- ST:** Spasmodic torticollis
- TWSTRS:** Toronto Western spasmodic torticollis rating scale

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botulinum toxin, and 75.21% of patients took multiple medications. It had been proved that these therapies had no benefit or a mild/short-lasting effect.

The inclusion criteria were: 1) noncongenital spasmodic torticollis; 2) absence of systemic dystonic diseases; 3) no significant brain lesion or severe malformation of the cervical spine (confirmed by magnetic resonance imaging [MRI]/computed tomography); 4) ST of the subtypes of laterocollis and horizontal torticollis; and 5) general health status. In addition to MRI/computed tomography, 3-dimensional time of flight magnetic resonance angiography was also performed preoperatively to identify the relationship between the spinal accessory nerve and arteries. All the patients received electromyography of the cervical musculature preoperatively and postoperatively.

Operative Technique

All patients were put in the lateral decubitus position and the operation was performed with a retrosigmoid approach. After the edge of the sigmoid sinus was identified, the dura mater was opened. The dissection was started from the caudal cranial nerves (CNs). For the MVD group, the arachnoid membrane around the cervical spinal cord was opened and the neurovascular relationship was carefully studied. Using microsurgical techniques, the artery that compressed the root exit zone of the spinal accessory nerves, C1-2 nerve roots, and cervical spinal cord was transposed and soft shredded Teflon was put between them. For the group of patients who underwent the neurectomy, after the nerve was exposed, the spinal accessory root was cut, and no other manipulation was performed.

Outcome Evaluation

All patients were evaluated by either an interview in the clinic (for local patients) or telephone interview (for patients in other cities) at 3, 6, and 12 months after discharge. The total score of Toronto

Western spasmodic torticollis rating scale (TWSTRS) was used. The effect of the surgery was evaluated by the reduction in the TWSTRS total scores before and after surgery. Reduction of 75%–100% of the TWSTRS score was considered as excellent, 25%–75% as moderate, and <25% as no relief. The mean duration of the postoperative follow-up period was 18.7 months (range, 12–27 months).

Statistical Analysis

The paired t-test was used to explore the improvement rate before and after the surgery. The χ^2 test and Student's t-test were used to compare data between the 2 groups. Analyses were performed with SAS V9 (SAS Institute, North Carolina, USA) and were 2-sided at α of 0.05.

RESULTS

Preoperative MRI with 3-dimensional time of flight sequence showed that there was an artery in close relation to the accessory nerve or cervical spinal cord in each case (Figure 1).

Intraoperative Findings

Among the 80 cases in the MVD group, the most common offending vessels were vertebral artery in 70 patients (87.5%), posterior inferior cerebellar artery in 9 patients (11.25%), and arteriole in 1 patient (1.25%) (Figures 2 and 3). The most common location of the compression on the spinal accessory nerve was between the dural perforation of the vertebral artery and the dural attachment of the C1 dentate ligament (Figure 1).

Surgery Outcomes

Because this is a retrospective study, the patients were not randomized. However, there were no significant differences in demographics and dystonia characteristics between the groups ($P > 0.05$) (Table 1). The TWSTRS total score of the MVD group and the neurectomy group was lowered by $50.43\% \pm 20.3\%$ and

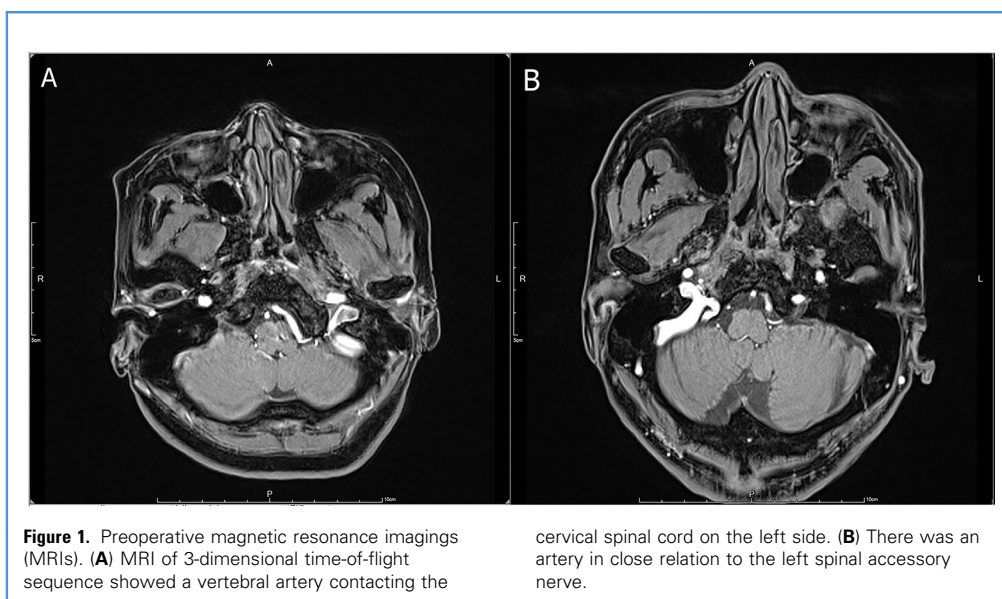


Figure 1. Preoperative magnetic resonance imaging (MRIs). (A) MRI of 3-dimensional time-of-flight sequence showed a vertebral artery contacting the

cervical spinal cord on the left side. (B) There was an artery in close relation to the left spinal accessory nerve.

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