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BRIEF COMMUNICATIONS

Myectomy of Lateral Rectus Muscle for Third Nerve Palsy

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Purpose: To introduce myectomy of the lateral rectus muscle for correcting exotropia in patients with third nerve palsy.

Methods: The lateral rectus muscle of the paretic eye was myectomized without suturing it to the globe. This was combined with a medial rectus muscle resection and a contralateral lateral rectus muscle recession. Magnetic resonance imaging was performed to observe the re-attachment of the lateral rectus muscle to the globe.

Results: The patient was able to fuse in the primary position without any noticeable limitation in abduction. Magnetic resonance imaging showed that the lateral rectus muscle was attached to the globe through fibrous tissue.

Conclusion: Myectomy of the lateral rectus muscle is an effective and simple procedure to accomplish a super-maximal weakening effect of abduction in patients with complete third nerve palsy. **Jpn J Ophthalmol 2000;44:555–558** © 2000 Japanese Ophthalmological Society

Key Words: Exotropia, MRI, myectomy, surgery, third nerve palsy.

Introduction

A realistic goal for the surgical treatment of third cranial nerve palsy is to align the eyes in the primary position. In cases where the medial rectus muscle remains functioning, large recession and resection of the horizontal muscles are recommended.[1] Superior oblique tendon transposition[2] with or without fracturing the trochlea is recommended for cases with complete pareses of the medial rectus muscle. Regardless of which procedure is to be performed, a large recession of the lateral rectus muscle improves the effectiveness of the treatment. Helveston[3] reported lateral rectus muscle recession with 80% double marginal myotomy as a super-maximal recession procedure. We performed a myectomy of the lateral rectus muscle to accomplish a further weakening effect.

Case Report

A 55-year-old woman presented with a 10-year history of right third nerve palsy of unknown cause, despite intensive neurological work-ups at the time of the onset. Her best corrected visual acuity was 1.0 OU. Ptosis was not noted at the examination, but adduction, supraduction, and infraduction were significantly limited. The right pupil was dilated and the light reflex was absent. Because her symptoms had not changed for a long time, further search for the cause of the palsy was not performed. There was no evidence of aberrant regeneration. The angle of deviation was approximately 100 prism diopters and the eye did not pass the midline (Figure 1). Extensive recess-resect procedures of the horizontal muscles were considered to be the first choice for this patient. However, her horizontal deviation was so great that a satisfactory result could hardly be expected; therefore, myectomy of the lateral rectus muscle was planned. The potential risk of a limitation in abduction by this procedure was explained to the patient, and informed consent was obtained before proceeding.

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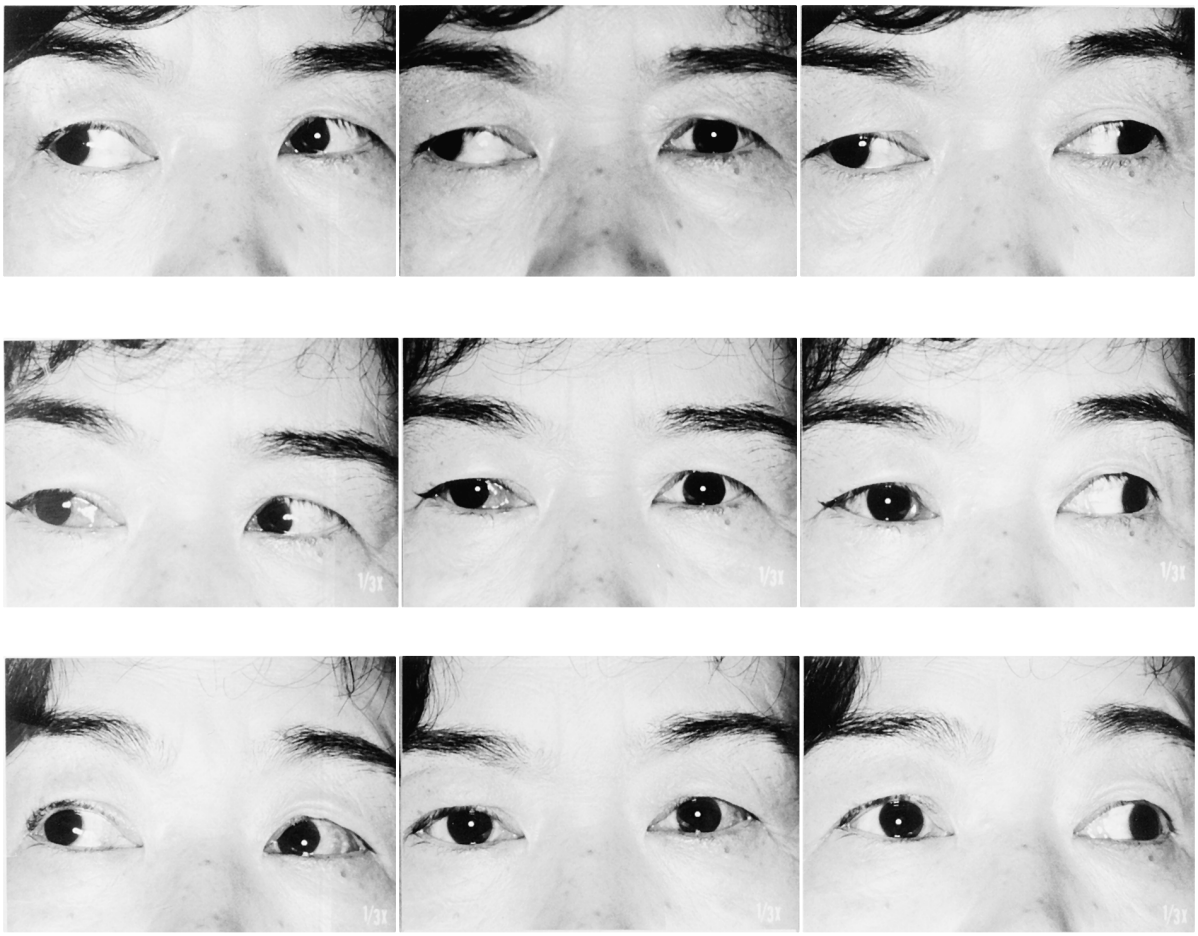

Figure 1. Horizontal eye movement: top, pre-op; middle, 1 week after myectomy of lateral rectus muscle and resection of medial rectus muscle in right eye; bottom, 3 months after recession of lateral rectus muscle of left eye.

The first surgery was performed under anesthesia of the sub-Tenon capsule. Forced duction test revealed mild limitation in adduction. The lateral rectus muscle of the involved eye was explored by a limbal approach and engaged with a muscle hook. The intermuscular membrane was dissected from the muscle borders to a point slightly exceeding 10 mm. A muscle clamp was placed across the lateral rectus muscle 10 mm from the insertion. A section of the muscle was excised with scissors, and the cut end was cauterized and left without being sutured to the sclera. Then the medial rectus muscle was resected 10 mm.

Postoperatively, the angle was reduced to 75 prism diopters when the patient was fixating with her right eye, 45 prism diopters when fixating with her left eye. Then the right eye was able to move past the midline. Magnetic resonance imaging was performed 3 months after the surgery, and the lateral rectus muscle was seen to be attached to the globe through fibrous tissue. When the patient attempted to adduct or abduct, the size of the lateral muscle changed. The medial rectus muscle did not change in size in any field of gaze. The eye movements seemed to be controlled by the function of the myectomized lateral rectus muscle attached to the globe through fibrous tissue (Figure 2A).

Four months after the initial surgery, the lateral rectus muscle of the noninvolved eye was recessed 8.5 mm for the treatment of the residual exotropia. After the second operation, the patient was able to fuse in the primary position. Because she had strong suppression after long-standing exotropia, she did not show any measurable stereoscopic vision or complain of diplopia. The results of these surgical proce-

dures had not changed at the final examination performed 7 months after the second surgery.

Discussion

This procedure can be considered to create a "lost" muscle intentionally. Even though a muscle is lost unintentionally, it may still produce some globe movement by the duction force it transmits through Tenon's capsule and the intermuscular septum to the globe.[4] Although a "lost" muscle is a serious complication of strabismus surgery, when it occurs in an eye with a paretic medial rectus muscle, limitation of abduction is minimal and it is beneficial for increasing the weakening effect.

This is a single experience on a carefully selected patient and further study is required. This procedure is not quantitative and is irreversible and, therefore, we recommend that it be performed only on cases with a severely atrophic medial rectus muscle (Figure 2B). This procedure is easy to perform and can be combined with or followed by resection of the medial rectus muscle or transposition of the superior oblique muscle.

In conclusion, myectomy of the lateral rectus muscle can be considered to induce a super-maximal weakening effect of abduction.

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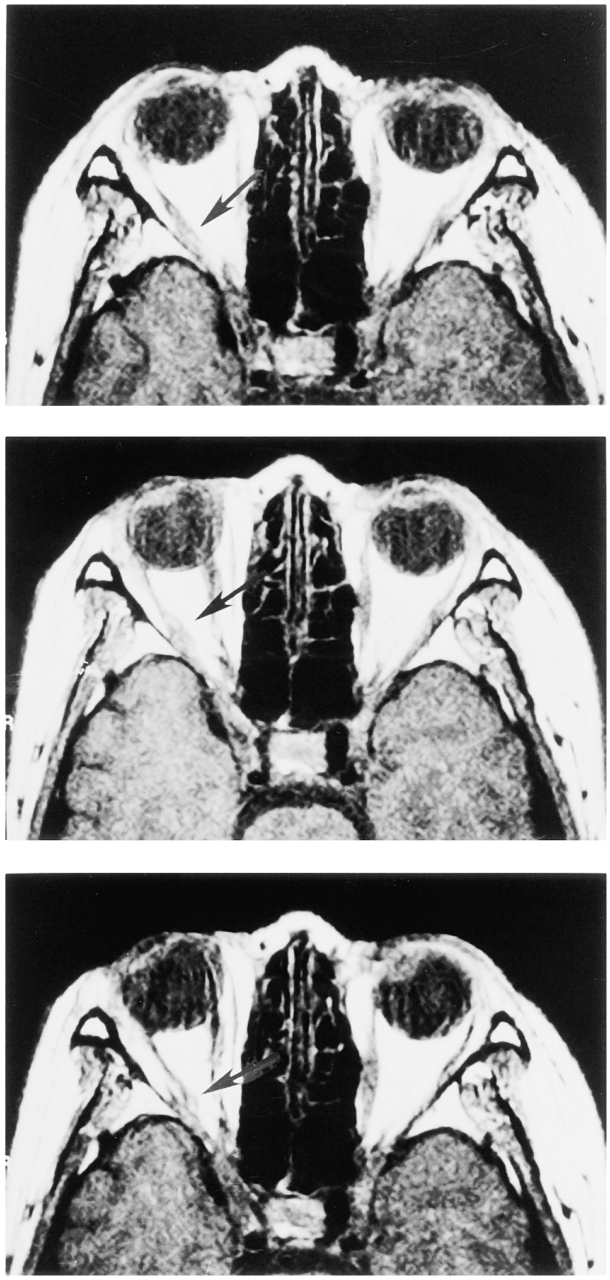

Figure 2A. (**A**) Magnetic resonance imaging (MRI) horizontal scan MRI performed 3 months after myectomy of right lateral rectus muscle. Arrows indicate myectomized lateral rectus muscle in different gaze positions. Top, left gaze; middle, primary position; bottom, right gaze.

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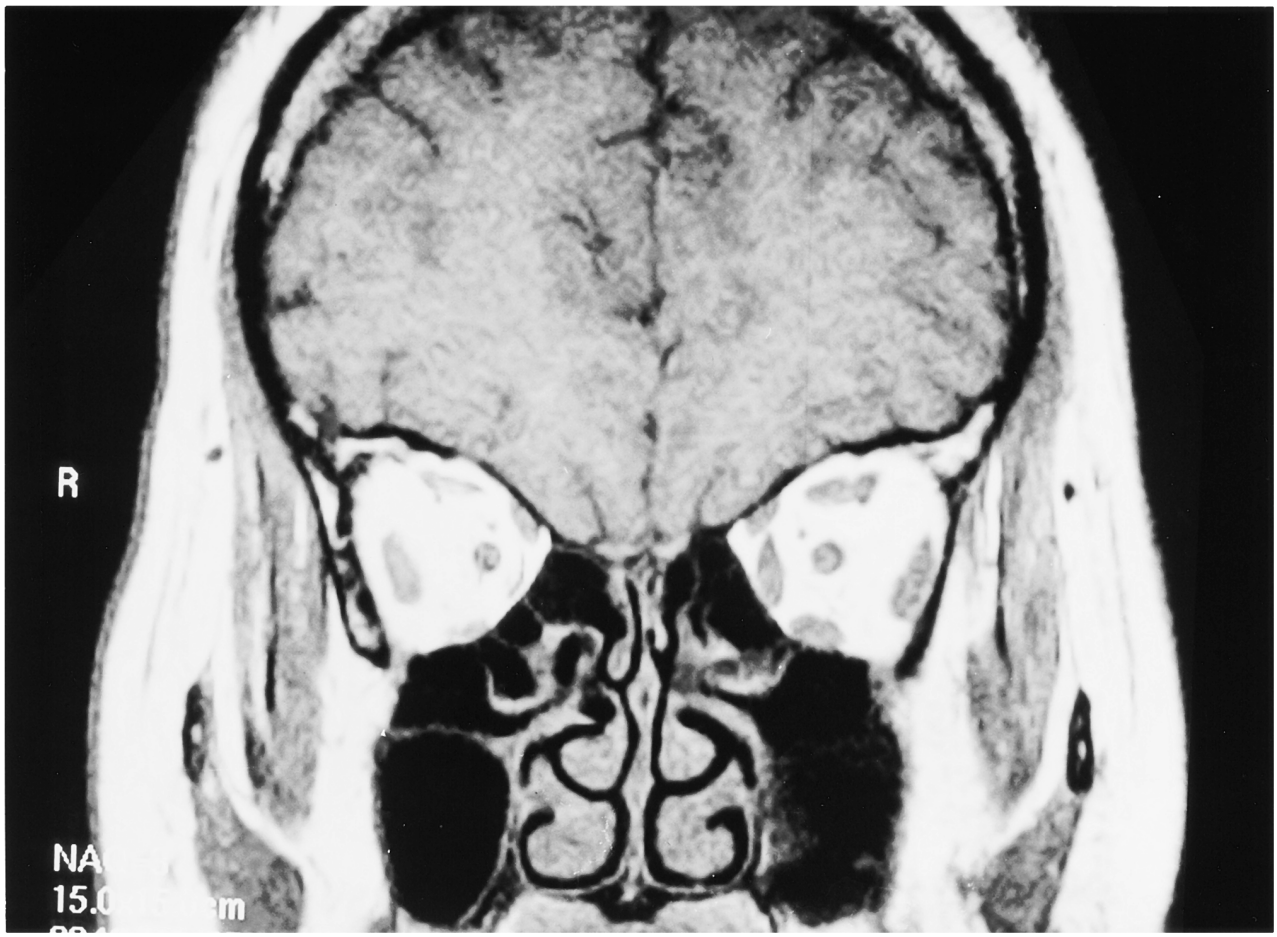

Figure 2B. (**B**) MRI coronal scan shows atrophic medial rectus muscle, superior rectus muscle, and inferior rectus muscle. Lateral rectus muscle and superior oblique muscle of right eye are equal in size to those of left eye.