Scholars Journal of Medical Case Reports **ISSN 2347-6559 (Online)**
Sch J Med Case Rep 2016; 4(9):653-654 **ISSN 2347-9507 (Print)**

(An International Publisher for Academic and Scientific Resources) DOI: 10.36347/sjmcr.2016.v04i09.007

Temporal transposition of the inferior rectus muscle in a patient with incyclotropia

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Abstract: A 73-year-old man presented with torsional diplopia. With major amblyoscope he measured 10 degrees of incyclotropia in primary position and 20 degrees of incyclotropia in downgaze. The patient had undergone temporal transposition of the left inferior rectus muscle in order to reduce incyclotropia in downgaze. Postoperatively, incyclotropia was reduced to 8 degrees. However, he complained horizontal diplopia in lateral gaze. Therefore, the patient underwent the left lateral rectus muscle recession. Finally, the patient had no diplopia. Although temporal transposition of the inferior rectus muscle is an efficient method to correct for incyclotropia, we should be aware that this procedure might induce new horizontal and vertical deviation.
Keywords: Incyclotropia, Vertical rectus muscle transposition.

INTRODUCTION

Cyclodeviation is defined as the rotation of an eyeball along the anteroposterior axis and cyclotropia as a misalignment of cyclodeviation between the two eyes [1]. Generally, patients with torsional deviations rarely complain of torsional diplopia. However, considering that cyclotropia cannot be corrected with prisms, the evaluation of cyclodeviation can be of considerable help in the diagnosis and management of the strabismus. In addition, a large horizontal or vertical deviation might interfere with the patients' ability to recognize torsional diplopia. Recently, horizontal transposition of the vertical rectus muscles have been proposed for the treatment of cyclotropia [1, 2]. Several reports have described the surgical outcomes of excyclotropia. However, there are few reports regarding surgical results of incyclotropia [1-4]. We present a case of incyclotropia treated with vertical muscle transposition procedure.

CASE REPORT

A 73-year-old man was referred to Jichi Medical University Hospital because of torsional diplopia. His best corrected visual acuity was 1.2 in both eyes. Slit-lamp and funduscopic examination showed no abnormal findings. His right eye showed mild hypertropia. With major amblyoscope he measured 10 degrees and 20 degrees of incyclotropia in primary position and downgaze, respectively (Table 1).

Table 1. Preoperative subjective angle of the patient in 5 gaze positions

+ 4 ˚ L/R=0.5 ˚ In 5.5 ˚		+ 5 ˚ R/L=1 ˚ In 5 ˚
	+ 1 ˚ R/L=0.5 ˚ In 10 ˚	
- 1 ˚ L/R=3.5 ˚ In 20 ˚		±0 ˚ R/L=1 ˚ In 15 ˚

We diagnosed the patient with mild hypertropia and marked incyclotropia as underaction of the left inferior rectus muscle. The patient had undergone temporal transposition of the left inferior rectus muscle in order to reduce incyclotropia in downgaze. Postoperatively, incyclotropia was reduced to 8 degrees (Table 2). However, he complained of horizontal diplopia in left lateral gaze.

Table 2. Postoperative subjective angle of the patient in 5 gaze positions.

+ 2 ˚ L/R=1.5 ˚ In 7 ˚		- 1 ˚ L/R=0.5 ˚ In 6.5 ˚
	- 1.5 ˚ L/R=1 ˚ In 8 ˚	
- 4 ˚ L/R=6 ˚ In 8 ˚		- 5 ˚ L/R=1.5 ˚ In 8 ˚

Further surgery was undertaken aiming to reduce the exodeviation. Therefore, the patient underwent the left lateral rectus muscle recession. Finally, he had an excellent postoperative outcome (Table 3).

Table 3. Final subjective angle of the patient in 5 gaze positions

+ 3 ˚ L/R=0.5 ˚ In 5 ˚		+ 3 ˚ R/L=1 ˚ In 5 ˚
	+ 1 ˚ In 6 ˚	
- 1 ˚ L/R=3.5 ˚ In 10 ˚		±0 ˚ R/L=0.5 ˚ In 8 ˚

At the 6 month follow-up visit, he was orthotropic and fusing in all gaze positions. The patient was satisfied with the surgical outcome.

DISCUSSION

Initially, incyclodeviation was larger than horizontal or vertical deviation in this present patient. Although incyclodeviation remained postoperatively, his torsional diplopia was improved. We consider that he could make use of cyclofusional adaptation [5] in order to compensate the torsional component of his strabismus after initial surgery. However, he was newly aware of horizontal diplopia. We consider that transposition surgery might induce new horizontal and vertical deviation.

Previously, von Noorden [1] studied the effect of horizontal transposition of the vertical rectus muscles on incyclotropia and excyclotropia. Excyclotropia was treated with nasal transposition of the inferior rectus muscle and incyclotropia with nasal transposition of the superior rectus muscle, to which we added temporal transposition to the inferior rectus muscle. The average effect of horizontal transposition of one vertical rectus muscle for cyclotropia was a correction of 7 degrees in primary position and of 11 degrees in downgaze. In this present case, surgical correction of incyclotropia obtained 12 degrees.

Although the current findings are based on a single case, we believe that temporal transposition of the inferior rectus muscle is an efficient method to correct for incyclotropia. In addition, we should be consider that torsional cyclofusion is varied by individual.

Disclosure Statement: The authors have no conflicts of interest to disclose.

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