

# Medial Rectus Plication in the Management of Dissociated Horizontal Deviation: Case Report and Literature Review

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## Abstract

**Purpose:** To report a case of medial rectus plication for the management of dissociated horizontal deviation (DHD).

**Methods:** We introduce medial rectus plication for improving the control of exoshift of DHD.

**Results:** A 20-year-old woman with a chief complaint of left eye outward deviation since childhood was referred to the strabismus clinic. The diagnosis of DHD was made according to the detection of asymmetric slow abduction of the left eye (50 prism diopter) during visual inattention or cover testing. The left lateral rectus (LR) was recessed 8 mm with a posterior fixation suture (PFS). In the early postoperative period, the control of DHD improved; however, after 6 months, the patient and her parents complained of frequent observation of the exoshift of the left eye (30 prism diopter). For better control of DHD, medial rectus plication (5 mm) of the left eye was considered the second operation. After 12 months of follow-up, the control of deviation improved, and there was no manifest deviation.

**Conclusions:** The literature's recommended procedure for unilateral DHD without a duction deficit is to perform a unilateral LR muscle recession. Some authors have proposed adding PFS to augment the effect of LR recessions. Although recurrence may occur, medial rectus plication can be considered one of the reversible options and can be used in recurrences of DHD after the first surgical procedure.

**Keywords:** Dissociated horizontal deviation, Medial rectus, Plication

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## INTRODUCTION

Dissociated horizontal deviation (DHD) is a part of dissociated strabismus complex (DSC) characterized by slow outward movement of the eye in visual inattention periods. It usually accompanies dissociated vertical deviation (DVD). However, DHD is less well-known than DVD, and DVDs are more prominent than DHDs in most cases.<sup>1</sup>

There is much confusion over DHD, thus no specific surgical procedure has been accepted for DHD, and surgical modalities addressing DVD have no effect on horizontal deviation.<sup>1</sup> In 1991, Wilson *et al.* who presented a case series of six patients with DHD showed good results with lateral rectus (LR)

recession. They reported long-term outcomes of DHD patients who underwent unilateral or bilateral LR recession. The authors concluded that unilateral surgery is sufficient in most of the cases, although some require bilateral surgeries.<sup>2</sup>

The recommended approach in the literature for patients with predominantly unilateral DHD without duction deficit is to perform a unilateral LR muscle recession.<sup>2</sup> Several authors have proposed adding a posterior fixation suture (PFS) to augment the effect of LR recession.<sup>3</sup> However, like DVDs, DHD may have recurrences and management sometimes includes additional operations.

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In this study, we present the successful treatment of a case of residual DHD treated with medial rectus plication, as a novel surgical approach in the management of DHD.

## CASE REPORT

A 20-year-old woman with a chief complaint of left eye outward deviation since childhood was referred to strabismus clinic. The patient had a positive family history of surgically treated intermittent exotropia in her siblings.

On examination, best-corrected visual acuity of 20/25 in the right eye and 20/30 in the left eye were detected. The full cycloplegic refraction of the right eye was  $-1.00$  diopter and  $-2.00-1.5^\circ \times 45^\circ$  diopter in the left eye. The diagnosis of DHD was made according to the detection of asymmetric slow abduction of the nonfixating eye during visual inattention or cover testing. The measurement of DSCs is usually not precise, and the prism uncover test is used for estimating the deviation. When the right eye was fixator, there was 50 prism diopter (PD) exotropia of the left eye; however, when the left eye was fixator, there was  $<10$  PD exotropia of the right eye. The exoshift of the left eye was variable and was increased depending on the visual attention and concentration of the patient. There was concomitant DVD of the left eye. However, the horizontal misalignment was predominant. The patient had no gross stereoacuity. At the first operation, the left LR was recessed 8 mm with PFS. In the early postoperative period, the control of DHD improved; however, after 6 months, the patient and her parents complained of frequent observation of exoshift of the left eye [Figure 1]. On examination, again when the right eye was fixator, there was up to 30 PD exoshift of the left eye, especially in visual inattention periods. When



**Figure 1:** Preoperative photos showing manifest dissociated horizontal deviation of the left eye

the patient fixated with the left eye, there was no exoshift of the right eye. For better control of DHD, medial rectus plication of the left eye was considered the second operation. Surgery was performed under general anesthesia, using a limbal conjunctival incision. The medial rectus was hooked and sutured with double-armed polyglactin suture (Vicryl 6-0; Ethicon) 5 mm from the scleral insertion corresponding to the plication amount. The two sutures were then passed through the scleral muscle insertion. Then, the muscle was folded anteriorly by pulling and fixing the sutures. The conjunctiva was closed with a second polyglactin suture (Vicryl 8-0; Ethicon). Antibiotic and corticosteroid ointments were administered daily for 2 weeks postoperatively. After 12-month follow-up, the control of deviation was improved, and there was no manifest deviation [Figure 2], although there was still some latent DHD on covering the left eye. No consecutive exoshift occurred.

Mild bumping was observed on the nasal conjunctiva in the early postoperative period, decreased gradually to an unnoticeable level at the final follow-up visit. All the surgeries were explained to the patient, and written consent was obtained from the patient for both surgeries.

## DISCUSSION

Dissociated strabismus is a well-known exception to Hering's law of equal motor correspondence. DHD is a part of DSC and is characterized by the slow velocity of spontaneous exodeviation.<sup>4</sup> In DHD, typically, the exodeviation is variable, and the magnitude increases in periods that the patient is distracted.<sup>5</sup>

The peculiar character of DHD makes surgical strategy planning difficult, and different procedures have been



**Figure 2:** Postoperative photos show a favorable outcome

recommended. In 1987, Raab recommended the use of PFS on the LR muscle for abduction-dissociated movements.<sup>6</sup> In 1991 Wilson and McClatchey recommended LR muscle recession for the treatment of manifest DHD.<sup>5</sup> In another study, Wilson *et al.* reported good results with graded unilateral LR recession with surgical doses of 5 and 7 mm of unilateral LR muscle recession for unilateral DHDs under and over 15 PD, respectively. Fifteen percent of their patients needed second surgery that underwent contralateral LR recession.<sup>2</sup> Built on this idea, Romero-Apis, performed a combination of unilateral 5-mm LR muscle recession and PFS in 12 patients with the elimination of DHD in half of the patients.<sup>7</sup> In a recent study, Lyu *et al.* reported good results after long-term follow-up of 11 patients with DHD treated with LR muscle recession. Recommended surgical doses were ipsilateral LR recession of 6.0 mm for 12 PD, 7.0 mm for 15 PD, 8.0 mm for 20 PD, 8.5 mm for 25 PD, and 8.0 mm with (PFS) for DHD with exodeviation of >30 PD.<sup>3</sup>

In the current study, to the best of our knowledge, for the first time, we introduced medial rectus plication for improving the control of exoshift of DHD. In 1991, Wright and Lanier introduced muscle plication as a modification of tightening procedure which sutures muscle to sclera instead of muscle to muscle. It has become more popular as an alternative procedure for muscle resection. Simplicity, shorter operation time, early reversibility, and vessel sparing are the advantages of this technique.<sup>8,9</sup> The plication procedures have comparable effects to resection with minimal dissection and trauma.<sup>10</sup> Moreover, the minimal risk of slipped or lost muscles in the postoperative period is the additional benefit of this method.<sup>11</sup> It should be kept in mind that although reversibility is an advantage, it works only for a couple of weeks. Previous studies have shown that there is no complaint of appearance after plication procedures. In surgical correction of DSCs, plication procedures have been used previously in the management of DVDs. Arroyo-Yllanes *et al.* showed good results performing inferior rectus plication for the management of DVD.<sup>12</sup>

Surgical managements of DSCs have never eliminated the strabismus, and the aim of these procedures is to help the patient better control the manifest deviation. There are several options for the surgical management of DHD. Medial rectus plication can be considered one of the reversible options and

can be used in recurrences of DHD after the first surgical procedure.

### **Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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Nil.

### **Conflicts of interest**

There are no conflicts of interest.

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