İNFERİOR OBLİK KASININ ZAYIFLATILMASI: MYOTOMİ Mİ ANTERİOR TRANSPOZİSYON CERRAHİSİ Mİ?

WEAKENING OF INFERIOR OBLIQUE MUSCLE: MYOTOMY OR ANTERIOR TRANSPOSITION?

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ÖZET

Giriş: İnferior oblik kasının zayıflatılmasında bir çok cerrahi metod kullanılmaktadır. Günümüzde myotomi ve anterior transpozisyon (İOAT) cerrahisi kliniğimizde en sık kullanılan tekniklerdir. Çalışmamızı bu teknikleri karşılaştırmak için planladık.

Metod: Bu, eğitim ve araştırma hastanesinde yürütülen retrospektif bir çalışmadır. İnferior oblik zayıflatma cerrahisi geçiren 50 hastanın dosyaları retrospektif olarak incelendi. Ortalama yaşları 9.34±6.25 olan 50 hastanın 76 gözüne operasyon uygulandı. Ellibir göze myotomi, 25 göze anterior transpozisyon uygulandı. İnferior oblik hiperfonksiyonu (İOHF) +1 ile +4 arasında derecelendirildi. İki cerrahi grupta operasyon öncesi ve sonrası İOHF karşılaştırıldı.

Sonuçlar: Myotomi grubunda cerrahi öncesi ve sonrası İOHF sırasıyla +2.46±1.25 ve +0.45±0.87 idi. Anterior transpozisyon grubunda cerrahi öncesi ve sonrası ise +2.44±1.12 ve +0.27±0.54 idi. Cerrahi öncesi ve sonrası İOHF farkı gruplar arasında istatistiksel olarak anlamlı bir fark göstermemekteydi (p=0.79).

Yorum: İki teknikte cerrahi sonuçlar benzerlik göstermektedir. Bu bulgular cerrahi başarısızlıkta, teknikten çok anatomik faktörler yada gözden kaçan oblik kası liflerinin rolü olabileceği hipotezini destekleyebilir. Ancak ileri çalışmalarla bu hipotez araştırılmalıdır.

Anahtar Kelimeler: İnferior oblik kası, myotomi, anterior transpozisyon, inferior oblik güçsüzleştirme

ABSTRACT

Introduction: There are several methods for weakening of the inferior oblique muscle. Currently myotomy and anterior transposition are the most frequently applied techniques in our clinic. We have planned this study to compare these two techniques.

Methods: This is a retrospective study in an education and research hospital. The records of 50 patients who had inferior oblique weakening surgery were retrospectively evaluated. Seventy six eyes of 50 patients with mean age of 9.34±6.25 were operated. Fifty one eyes had myotomy and 25 eyes had anterior transposition. The inferior oblique hyperfunction was graded between +1 to +4. The inferior oblique functions before and after the operation were compared.

Results: The preoperative and postoperative inferior oblique overaction in eyes with myotomy was +2.46±1.25 and +0.45±0.87 respectively. Whereas the preoperative and postoperative inferior oblique overaction in eyes with anterior transposition was +2.44±1.12 and +0.27±0.54, respectively. The difference of preoperative and postoperative inferior oblique overactions between groups of eyes treated with myotomy and anterior transposition were not statistically different (p=0.79).

Conclusions: The surgical results of both techniques seem to be similar supporting the hypothesis that failure rates may be due to anatomical factors and missed inferior oblique fibers rather than the surgical technique which should be studied further.

Key Words: Inferior oblique muscle, myotomy, anterior transposition, inferior oblique weakening

Introduction

Increased elevation in adduction, commonly termed as inferior oblique overaction (IOOA), may be treated by various surgical procedures that have been described to weaken the ipsilateral inferior oblique muscle, including inferior oblique myectomy, graded recession of the inferior oblique muscle, disinsertion, extirpation, marginal myotomy and more recently, inferior oblique anterior transposition (IOAT)[1-6]. Of these, inferior oblique myectomy, inferior oblique recession and inferior oblique anterior transposition appear to be the most popular[2]. The purpose of this study was to compare the efficacy of inferior oblique myotomy and inferior oblique anterior transposition in improving inferior oblique overaction.

Materials and Methods:

A retrospective case note review of all patients who underwent primary inferior oblique weakening surgery over a period of 8 years (2002-2010) at the strabismus service was undertaken. The institutional review board approval was received. Data collected included the diagnosis, best corrected visual acuity, stereopsis (assessed by TNO test) at presentation, pre and postoperative ocular deviation in the nine cardinal positions of gaze, pre and postoperative degree of overaction of the inferior oblique muscle (graded from 0 to 4) and the effect of surgical intervention on the overacting muscles. The prescription glasses normally worn by the patients were used during the TNO stereo tests. Tests were administered according to the instructions in the information manuals provided. The fail-pass thresholds were chosen according to the prescription manuals of each test and suggestions in the previous reports. The fail-pass threshold was 240" for the TNO test[7].

The degree of overaction was graded on a 0 to 4 scale, which corresponds to approximately 0 to 20 degrees of hypertropia (in 5_ steps) of the involved eye in the field of action of the inferior oblique muscle. In patients with unilateral involvement, the ipsilateral muscle was weakened, and in patients with bilateral involvement, bilateral weakening was carried out. Inferior oblique anterior transposition was performed by disinserting the inferior oblique muscle and anchoring it to the sclera along the lateral border of the inferior rectus muscle, very close but not anterior to its insertion.The posterior fibers of the IOOA were attached temporally to a position 8 to 9 mm posterior to the limbus. With inferior oblique myotomy, the inferior oblique muscle was identified, dissected from surrounding fascia, and clamped and cut temporal to the lateral border of the inferior rectus muscle.

The IOOA before and after the operation was compared between the two operative groups by the students t test.

Results:

Seventy six eyes of 50 patients, with a mean age of 9.34±6.25 years, were operated. Fifty one eyes had myotomy and 25 eyes had anterior transposition. None of the eyes had hypertropia in primary positon. Twenty five patients had bilateral IOOA concomitant with horizontal deviation and 26 eyes had unilateral IOOA with superior oblique underaction. The mean visual acuity (log MAR) and stereopsis (in TNO), the mean difference between amblyopic eyes are noted in table 1. The distribution of bilateral and unilateral involvement was not different between the two groups (p=0.94). The types and mean of horizontal deviations in patients with anterior position and myotomy are noted in table 1.

The indication for surgery was the IOOA and V pattern in bilateral cases and for the head position in unilateral cases with superior oblique underaction. The ratio of stereopsis and amblyopia were not significantly different between the patients who had myotomy and those patients who had anterior transposition (p values= 0.07 and 0.06 for amblyopia and stereopsis respectively). The preoperative and postoperative inferior oblique overaction in eyes with myotomy was +2.46±1.25 and +0.45±0.87 respectively. Whereas, the preoperative and postoperative inferior oblique overaction in eyes with anterior transposition was +2.44±1.12 and. +0.27±0.54 respectively. Ten cases in the myotomy group and 6 cases in the anterior transposition group did not show any response to surgery. There was no postoperative hypotropia in any of the patients. The difference of preoperative and post operative inferior oblique overactions between groups of eyes treated with myotomy and anterior transposition were not statistically different (Figure 1) (p=0.79).

As postoperative complications, restriction of elevation in abduction was noted in only one case with IOAT. Fullness of lower lid was not observed in any of the cases.

Discussion:

There are several studies with variable results in the literature comparing the results of surgical procedures for the weakening the IO muscle. Some studies have supported that IOAT may be superior to myectomy, especially in cases with severe IOOA[8-9]. Another report about a smaller group of patients has stated no difference between IO recession and IOAT[10]. Inferior oblique anterior transposition is a technically more difficult operation than inferior oblique myectomy and can cause fullness of lower lid postoperatively in about 25% of cases[11]. It has been reported to cause restriction of elevation in abduction[12] and it can also affect torsion[13]. Although inferior oblique myectomy is technically easier, locating the inferior oblique muscle at a later date for repeat surgery can be very challenging. Jones et al[6], in a study involving 337 patients, reported inferior oblique disinsertion to be effective in correcting inferior oblique overaction in 88% of patients with primary inferior oblique overaction and 72% of patients with secondary inferior oblique overaction.

Yılmaz et al have compared three techniques: disinsertion, myectomy and recession and have reported similar results with all three, 72.9 %, 75 % and 71.4 %, respectively for each (14). On the other hand, Eroğlu et al. have reported that results of recession were superior to tenotomy in 46 eyes[15]. Ghazawy et al.[16] have evaluated 120 eyes of 81 patients of whom 20 had anterior transposition of the inferior oblique and 100 eyes underwent myectomy. When postoperative inferior oblique overaction was considered, there was no statistically significant difference between myectomy and anterior transposition in both primary and secondary inferior oblique overaction. This study demonstrated both inferior oblique myectomy and inferior oblique anterior transposition to be effective in correcting primary and secondary inferior oblique overaction. Myectomy was reported to be effective in improving superior oblique underaction associated with both primary and secondary inferior oblique overaction. On this basis, the authors suggested that inferior oblique myectomy has some advantage over anterior transposition in treating combined inferior oblique overaction and superior oblique underaction and can be considered the procedure of first choice[16]. In our study, the rates of patients with superior oblique underaction was not different between the two groups. We could not do maddod rod test in this age group. Kocabeyoğlu et al have recently reported results in another age group that they were able to do Maddox test and fundus photography to evaluate torsion. They have noted that anterior transposition was superior to inferior oblique recession[17].

The amblyopia and stereopsis may be important sensorial factors that may affect the outcome of surgery in some cases; however, there was no difference in our two surgical groups for these parameters. In this study, the surgical results of both techniques (disinsertion and anterior transposition) seem to be similar, supporting the hypothesis that; failure rates may be due to anatomical factors and missed inferior oblique fibers, rather than the surgical technique, which should be studied further.

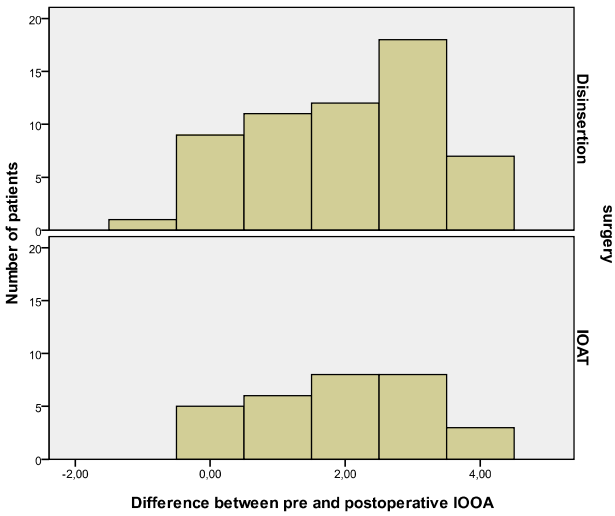

Figure 1. The difference between preoperative and postoperative inferior oblique over action (IOOA) in patients with myotomy and inferior oblique anterior transposition (IOAT).

Table 1. The cases with and without horizontal deviations in the two surgical groups and the amount of mean horizontal deviation (before and after horizontal rectus surgery) and ophthalmological findings in each group.

	Surgical group	
	Anterior Transposition	Myotomy
Mean best corrected visual acuity (logMAR)	0,21±0,34	0,08±0,11
Mean difference in betwwen two eyes in cases with amblyopia (Snellen)	0,31±0,11	0,21±0,13
Number of patients with stereopsis (TNO) of more than 240 arc second	Nill	2
Number of patients with esodeviation (mean pre and postoperative deviations)	6 (30±13PD preop, 8±2PD postoperatively)	10 (25±11PD preop, 6±1PD postoperatively)
Number of patients with exodeviation (mean pre and postoperative deviations)	2 (40±12PD preop, 10±4PD postoperatively)	7 (40±8PD preop, 8±2PD postoperatively)
Number of patients with no horizontal deviation	18	8

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