

Klinik Araştırma**The Efficiency of Subtenon Anesthesia Used in Strabismus Surgery****Şaşılık Cerrahisinde Kullanılan Subtenon Anesteziinin Etkinliği**

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ABSTRACT

Purpose: To investigate the effects of subtenon anesthesia on the pain that is applied during the operation and possible complications in strabismus surgery.

Methods: In this study 54 eyes of 51 patients who had strabismus surgery with subtenon anesthesia were evaluated prospectively. Twenty eight of the patients between the ages of 15-65 (mean 31±12,7 years) were male and 23 patients were female. There was horizontal strabismus in 49 cases, vertical strabismus in 5 cases and there were both horizontal and vertical strabismus in 6 cases. The problems during the surgery and the pain scores of the patients were recorded.

Results: During the study chemosis and subconjunctival hemorrhage due to the subtenon anesthesia were observed as complications. When the pain scores of the patients were evaluated; no pain (grade 0) in 5 patients (9.8%), slight discomfort feeling (grade 1) in 10 patients (19.6%), slight pain (grade 2) in 21 patients (41.2%), moderate pain (grade 3) in 11 patients (21.6%), severe pain (grade 4) in 4 patients (7.8%) were recorded. When the grading of the surgeon was evaluated; grade 0 in 4 patients (7.8%), grade 1 in 8 patients (15.6%), grade 2 in 20 patients (39.2%), grade 3 in 14 patients (27.5%), grade 4 in 5 patients (9.8%) were recorded. The scorings of the surgeon were found more pessimistic when it was compared with the patients' grading.

Conclusions: We think that subtenon anesthesia may be preferred on adult and cooperated patients due to the facts that morbidity of its possible complications during the surgery is lower than the other anesthetic methods.

Keywords: subtenon's block, anesthesia, adult strabismus surgery

ÖZET

Amaç: Şaşılık ameliyatlarında subtenon anesteziinin ameliyat sırasında ortaya çıkan ağrı üzerine etkisini ve olası komplikasyonlarını araştırmak

Yöntemler: Bu çalışmada subtenon anestezi ile şaşılık ameliyatı yapılan 51 hastanın 54 gözü prospektif olarak değerlendirildi. Yaşları 15-65 (ortalama 31±12,7 yıl) arasında olan hastaların 28'i erkek, 23'ü kadındı. Olguların 49'unda horizontal, 5'inde vertikal, 6'sında da hem horizontal hem de vertikal kayma mevcuttu. Cerrahi sırasındaki görülen problemler ve hastaların ağrı skorları kaydedildi.

Bulgular: Cerrahi sırasında görülen sorunlar sadece kemozis ve subkonjunktival kanama idi. Hastaların ağrı skorları değerlendirildiğinde; 5 hastada (%9.8) derece 0 (ağrı hissi yok), 10 hastada (%19.6) derece 1 (hafif rahatsızlık hissi), 21 hastada (%41.2) derece 2 (hafif ağrı), 11 hastada (%21.6) derece 3 (orta şiddette ağrı) ve 4 hastada da (%7.8) derece 4 (şiddetli ağrı) saptandı. Ağrı skorları cerrah tarafından derecelendirildiğinde ise; 4 hastada (%7.8) derece 0, 8 hastada (%15.6), derece 1, 20 hastada (%39.2) derece 2, 14 hastada (%27.5) derece 3 ve 5 hastada (%9.8) derece 4 olarak kaydedildi. Cerrahin ağrı değerlendirmesi hastalarinkine ile karşılaştırıldığında daha kötümser bulundu.

Sonuç: Yetişkin ve koopere hastaların şaşılık cerrahisinde diğer anestezi yöntemlerine göre ameliyat sırasında komplikasyon olasılığının daha az olması nedeniyle subtenon anesteziinin tercih edilebileceğini düşünüyoruz.

Anahtar Kelimeler: subtenon blok, anestezi, yetişkin şaşılık cerrahisi

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INTRODUCTION

Local anesthesia is preferred to general anesthesia especially in cooperated patients due to the fact that having fewer complications in most ocular surgeries and providing earlier rehabilitation. In strabismus surgery local anesthesia is commonly used in adult patients. Although retrobulbar and peribulbar anesthesia provides excellent analgesia and akinesia, due to many complications such as diplopia, orbital hemorrhage, globe perforation, central retinal vein or artery occlusion, optic nerve trauma and ptosis, subtenon anesthesia has become a preferable method for adult patients in strabismus surgery (1, 2). Topical anesthesia has been used in strabismus surgery too, but is not commonly preferred because of ocular pain or pressure feeling and discomfort of the patient. Few cases were reported which were rarely depended on subtenon anesthesia and had orbital hemorrhage superior oblique paralysis and rectus trauma. In this study, the effects of subtenon anesthesia in strabismus surgery on the pain during the operation and its possible complications are examined prospectively.

MATERIALS AND METHODS

In this study, 54 eyes of 51 patients who had strabismus operation by subtenon anesthesia were evaluated. The patients ages were between 15 and 65 (mean 31+12.7 years) and 28 of them were men (54.9%) and 23 of them were women (45.1%). Unilateral surgery was performed in 48 patients (94.1%) while bilateral surgery was performed in 3 patients (9.5%). All the operations were performed by the same surgeon. Surgery was applied to one muscle on 5 patients, to 2 muscles on 41 patients, to 3 muscles on 5 patients. There were horizontal strabismus in 49 eyes of 47 patients (90.7%) and there were vertical strabismus in 5 eyes of 4 patients (9.3%). There were both horizontal and vertical strabismus in 6 of 54 eyes (11.1%). Twenty patients had esotropia (bilateral surgery was applied to 2 patients), 22 patients had exotropia (bilateral surgery was applied in 1 case), 3 cases had dissociated vertical deviation (DVD) (bilateral surgery was applied in 1 case), 3 cases had hypertropia (HT), 2 cases had inferior oblique overaction (IOOA), 1 case had hypotropia and 1 case had superior oblique (SO) paralysis (Table 1). Patients were sedated by intramuscular 5 mg diazepam before the

operation 2 drops of %0,5 proparacaine (Alcaine®) were instilled topically on the conjunctiva in the quadrant to be incised. The patients were instructed to look at the opposite side of the area that the injection will be applied then, by entering 10 mm away from the limbus tenon were dissected by blunt scissors. Through this incision, a 19 gauge subtenon anesthesia cannula was entered from the cutting place and directed 5-7 mm to the back and then 5 ml of anesthetic solution (2.5 ml % 2 lidocaine, 2.5 ml bupivacaine) was infused. After waiting for 10 minutes, operation was started and afterwards additional subtenon anesthesia was applied as needed, during the operation. Problems during the surgery and the pain scores of patients were recorded. Pain scores were noted 15 minutes after the operation according to the descriptions of the patients and estimations of the surgeon. The pain scorings were shown in Table 2.

Table 2: Grading of pain.

Grade 0	No pain
Grade 1	Slight discomfort
Grade 2	Slight pain
Grade 3	Moderate pain
Grade 4	Severe pain

RESULTS

During the surgery chemosis (45%) and subconjunctival hemorrhage (35%) due to the subtenon anesthesia were observed. But, none of the cases reached to a point that needed to cancel the operation. During the operation and afterwards no other complications were recorded. When the pain scores of the patients' were evaluated; 5 patients (9.8%) had no pain (grade 0), 10 patients (19.6%) had slight discomfort (grade 1), 21 patients (41.2%) had slight pain (grade 2), 11 patients (21.6%) moderate pain (grade 3), 4 patients (7.8%) had severe pain (grade 4). When the surgeon's scoring were evaluated, 4 patients (7.8%) had grade 0, 8 patients (15.6%) had grade 1, 20 patients (41.2%) had grade 2, 14 patients (27.5%) grade 3 and 5 patients (9.8%) had grade 4 (Table 3). The surgeon evaluated acceptable pain (Grade 2 and less) in 64.6% of patients, however, 70.6% of patients were scored their pain as acceptable. The scorings of the surgeon were found more pessimistic when compared to the patients' scorings, but not statistically significant ($p=0.06$).

Table 1: Distribution of patients according to which muscles were operated.

Horizontal		Vertical			Combined			Total
ET	XT	DVD	HT	hipoT	XT+HT	ET+HT	XT+DVD	
19	22	1	2	1	3	1	2	51

ET: Esotropia, **XT:** Exotropia, **DVD:** Dissociated vertical deviation, **HT:** Hypertropia, **HipoT:** Hypotropia

Table 2: Pain scores of both patients and surgeon (as number and percent).

	Patient (No.)	%	Surgeon (No.)	%
Grade 0	5	9.8	4	7.8
Grade 1	10	9.6	8	15.6
Grade 2	21	41.2	20	39.2
Grade 3	11	21.6	14	27.5
Grade 4	4	7.8	5	9.8
Total	51	100	51	100

DISCUSSION

Subtenon anesthesia has been used in various eye surgeries since it was defined by Turnbull in 1884 due to the fact that it is fast, efficient and safe (3). In strabismus surgery, both topical and subtenon anesthesia came into use late because of the hesitations that it will overcome the pain and “pressure” sensation of related to extraocular muscles traction was hard to overcome. When total topical anesthesia is used, pain occurs when the muscles are pulled because sensorial innervations of muscles are on the proximal ends, near the annulus of Zinn. However in subtenon anesthesia if it can be waited enough after the anesthetic infusion or less pain occurs due to the muscle traction because of diffusion to retrobulbar area. In our study, when the pain during the surgery is evaluated by the patients, many of the patients (70.6%) declared that had slight sense of pain or less pain (grade 2 or less), only 0.8 percent of the patients stated severe pain. In the study of Steele and colleagues, 42% of the patients who were applied strabismus surgery with subtenon anesthesia had slight pain and 8% of the patients had moderate pain (1). Generally by decreasing traction during operation, discomfort of the patient can be minimized. When the acceptable pain scores declared by the patient (70.6% of patients) and the estimates of the surgeon (64.6% of patients) were compared it was clear that the surgeon was more pessimistic but this difference was not statistically significant ($p>0.05$) and possible reason for this is retrograde amnesia progress due to preoperative diazepam on the patients. In the literature, besides mild complications such as; conjunctival edema (%45 in our phenomena) that doesn't interfere with the surgery using subtenon anesthesia and subconjunctival hemorrhage (56% in various studies, 35% in our study), serious complications such as retrobulbar hemorrhage, permanent blindness due to temporary retinal or ophthalmic artery obstruction and possible traumatic optic neuropathy, vertical diplopia due to rectus muscle trauma, orbital hemorrhage and cellulitis were reported in small numbers too (4, 5, 6, 7, 8). In our study group, such serious complications were not observed at all.

This was further supported in a study that found a 60% reduction in the incidence of serious complications with subtenon anesthesia in comparison to peribulbar anesthesia, with 5 serious complications reported per 10, 000 patients in the subtenon group compared with 12 per 10,000 in the peribulbar group (9). Several studies also demonstrated that Sub-Tenon's block, combined with general anesthesia is also used safely for reducing postoperative pain and decreasing additional analgesia required in pediatric strabismus (10, 11).

We assume that strabismus surgery using subtenon anesthesia may be preferred in almost every adult and cooperative patient due to the facts that it is an effective analgesic method and can be tolerated well by patients and has a low morbidity when it is compared to other anesthesia methods such as general or retrobulbar anesthesia.

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