

SURGICAL CORRECTION OF STRABISMUS IN GRAVES OPTHALMOPATHY - CASE REPORT

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ABSTRACT

The aim of the study is to evaluate long-term results of surgical treatment of strabismus and diplopia associated with Graves ophthalmopathy in the 40-year-old patient.

The patient had preoperative diplopia and restricted mobility on the eyes. The patient was prescribed to wear Fresnel prisms prior to surgery. The patient achieved a single binocular vision without prisms after the operation. The muscles surgery of the both vertical recti on the right eye were performed by recession and reattachment of the muscle to the globe. On the left inferior rectus was performed recession with adjustment suture. Standard measures were used for the primary strabismus surgery of rectus inferior and rectus superior on the right eye, and adjustable suture surgery on the rectus inferior on the left eye. Adjustment of the sutures was done the day after the surgery. After two years of post-operative following, no need was observed for any subsequent operation.

Conclusion: The operation of the restrictive thyroid ophthalmopathy using recessive standard technique combined with adjustable sutures can provide excellent post-operative results and patient satisfaction.

Key words: Graves ophthalmopathy, thyroid ophthalmopathy, diplopia, surgical treatment

INTRODUCTION

Thyroid eye disease is an autoimmune condition. Thyroid ophthalmopathy is an inflammatory disorder of the extraocular muscles, orbital fat and orbital connective tissue, that is most commonly seen in patients with Graves hyperthyroidism. In the initial acute phase there is lymphocytic infiltration and edema of the extraocular muscles with deposition of glycosaminoglycan's and hyaluronic acid as well as adipogenesis (1). These processes can lead to an increase in the volume of the orbital contents such as periorbital swelling, extraocular muscle dysfunction, disfiguring proptosis, exposure keratitis, increased intraocular pressure and optic nerve compression. The inferior rectus is commonly affected, followed by the medial and superior rectus (2). Involvement of the extra-ocular muscles may be bilateral or unilateral.

AIM

The aim of the study is to evaluate long-term results of

surgical treatment of strabismus and diplopia associated with Graves ophthalmopathy in the 40-year-old patient.

CASE REPORT

A 40-year-old patient with vertical strabismus on the left eye (hypotropia) and restricted elevation of both eyes, was treated at the Department of Strabology at the University Eye Clinic in Skopje. After the operation he was regularly monitored every 6 months. The preoperative angle of vertical deviation was 25 PD of the hypotropia on the left eye. Left eyelid retraction and restrictive left hypotropia with very limited elevation of the left eye was present. There was a limited elevation of the right eye also. Visual acuity on both eyes was 1,0 without glasses. Diplopia was present. Initially, the patient had adopted a compensatory head posture to avoid the diplopia causing a muscle spasm characterized by discomfort on movement and restriction in the opposite field of sight. This resulted with secondary fibrosis of the involved muscles which prevented muscles relaxation, causing diplopia and

torticollis. Intraocular pressure was normal, on the right eye 14,6mm Hg and 17,3mm Hg on the left eye. Hertel exophthalmometer measured 22mm on the right eye and 23mm on the left eye. The thyroid function tests were in the normal range with positive autoantibodies. Magnetic resonance imaging (MRI) scan showed enlarged and edematous inferior rectus muscle on both eyes. ECHOG-raphy of the orbit showed hypertrophy of both inferior rectus muscles.

One year before the surgery, treatment in the form of immunosuppression (systemic corticosteroids) was prescribed to the patient. The patient responded well to the systemic corticosteroids, therefore was no need for surgery decompression.

After the end of the systemic corticosteroid therapy, the patient's eye proptosis was tapered and didn't re-activate, however there was restriction in both eyes mobility. Since the patient suffered with diplopia, the Fresnel prisms were prescribed and worn for 3-months before the surgery. On the non-dioptic glass was put 10 PD on the right eye with base-down prism and 10 PD on the left eye with base-up prism. The patient was active smoker and was advised to stop smoking. Measurements of the strabismus were stable 8 months prior to surgery.

At each ophthalmology visit, the patient underwent orthoptics evaluation with Hess chart and prism cover test measurements in all position of sight, both in near and distance fixation (Picture 1).



Picture 1. Graves ophthalmopathy, hypotropia OS, restriction of movements of both inferior recti

METHOD-SURGERY PLAN

The affected extra-ocular muscles were tight and fibrotic. Gaining access to the muscles was challenging. A forced duction test was carried out in order to assess the tightness of all the muscles. The position of the muscle insertion was measured prior to the recession it and again after the recession. After the recession of the left inferior rectus, the same was moved posteriorly 4mm and inserted adjustable suture. The adjustment of the sutures was done the next day after the surgery. The right inferior

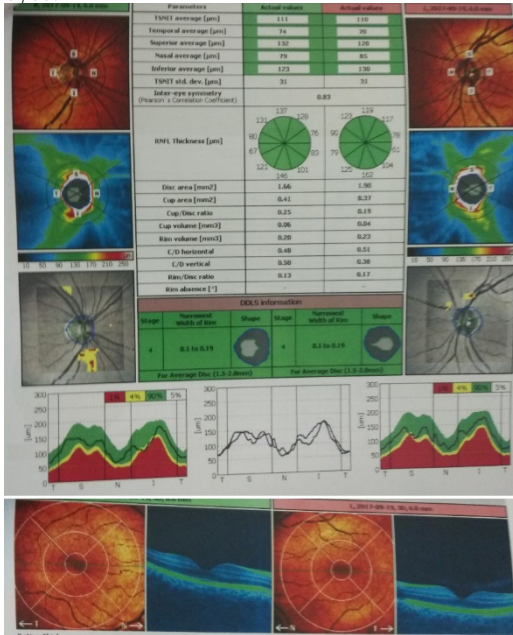
rectus was recessed 3mm. The right rectus superior muscle was resected 3mm and sutured 2mm anteriorly.

There was significant reduction in postoperative vertical deviation. The ocular deviation after 12 months postoperatively was 3 PD. On the cover test the eyes were in orthophoria for far and near, as well as single vision was achieved for far and near. Postoperatively, there was neither unusual inflammation nor increased restriction of the recessed muscles (Picture 2).



Picture 2. Orthophoria in the primary position after the strabismus surgery of the vertical deviation

After 2 years of the surgery, increased intraocular pressure on the left eye was measured at 22mm HG and anti-glaucomatous drops were prescribed. Visual field and optical coherent tomography was done on both eyes. OCT findings of both maculae were normal and the RNFL (retinal-nerve-fiber layers) of both optic nerve heads was symmetrical and normal (111 on the right eye and 110 on the left eye) (Picture 3). There were no scotomas or peripheral defects observed on the visual fields on both eyes.



Picture 3. Normal findings of OCT of the PNO and maculae of both eyes

DISCUSSION

Enlargement and dysfunction of the extraocular muscles is characteristic of thyroid orbitopathy and can cause strabismus with diplopia that is difficult to be treated. The diplopia is difficult to manage and significantly affects the quality of life of the patient, the ability to work, read, drive, etc (3,4).

Strabismus surgery guidelines may be helpful to optimize surgical results and to reduce the risk of reoperation. Surgery should not be performed before the strabismus deviation angle is stable for at least for 6 months (5).

Surgical goals and expectations should be defined and discussed with the patient. The main goal should be to restore BSV (binocular single vision) in the primary position at distance and near, as well as the reading position (5). It is important to stress the fact that multiple surgeries may be necessary to achieve this goal. Recession of the inferior rectus may result in lower lid retraction,

inducing gaze limitation. As in all forms of restrictive strabismus, muscle resection should be avoided because it is likely to aggravate the muscle movement. Strabismus hook is useful when operating on very tight muscles. Using the strabismus hook, complications such as globe perforation or inadequate capture of muscle tendon, may be avoided. Careful duction testing should be performed before operation and forced duction test has to be performed during the surgery. Larger muscle recession has to be accompanied by conjunctival recession to avoid postoperative restriction through conjunctival tethering. Patients with vertical strabismus develop a large fusional range for their deviation. Accordingly, a patient with right hyper-phoria will have developed the ability to remain binocular despite a large left hypo tropic deviation (5). Attention should be paid to dissection of Tenon's capsule, particularly around the inferior rectus since there is high incidence of slipped muscle after the large recession. This is partly due to inferior rectus muscles' short arc of contact with the globe, but also due to the presence of Tenon's capsule which may predispose to non-adhesion to the globe.

Surgery is helpful but more complex in TED (thyroid eye disease) than other types of strabismus (6). Pre-operative, the patient has to be counseled about the goals and limitations of strabismus surgery. This conversation and its understanding is of paramount importance, since a degree of limitation remains postoperatively even after two or even three surgeries (5). Other issues such as lid retraction following vertical rectus recession should also be discussed pre-operatively.

With careful planning and meticulous surgery, a satisfactory central field of binocular single vision can be achieved in the primary position and in downgaze, returning these patients to comfortable binocular status for the vast majority of their everyday life.

CONCLUSION

The operation of the restrictive thyroid ophthalmopathy using recessive standard technique combined with adjustable sutures can provide excellent post-operative results and patient satisfaction.

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ХИРУРШКА КОРЕКЦИЈА НА КРИВОГЛЕДСТВО КАЈ ГРЕЈВSOVA ОФТАЛМОПАТИЈА - ПРИКАЗ НА СЛУЧАЈ

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АБСТРАКТ

Цел: Евалуација на долгогодишните резултати од хируршката интервенција на кривогледството и двојното гледање при Грејвсовата офталмопатија кај 40 годишен пациент.

Пациентот имаше двојно гледање и ограничено движење на очните јаболка. Препишани се Фреснелови призми пред оперативно. Пациентот доби единичен бинокуларен вид без призматска корекција пост-оперативно. Хируршката интервенција на правите вертикални мускули на десното око беше изведена со рецесија и повторно припојување за склерата. На левиот прав долен мускул беше изведена рецесија со прилагодливи сүтури. Стандардни мерки беа користени за примарната хируршка интервенција на долниот и горен прав мускул на десното око, и прилагодливи сүтури на долниот прав мускул на левото око. Прилагодувањето на сүтурите беше изведено следниот ден по хируршката интервенција. По 2 години од следењето на пациентот, нема индикации за повторна хируршка интервенција.

Заклучок: Со операцијата на рестриктивната тироидна офталмопатија со примена на стандардните рецесивни процедури комбинирани со методата на прилагодливи сүтури може да се постигнат одлични постоперативни резултати и задоволство кај пациентот.

Клучни зборови: Грејвсова офталмопатија, тироидна офталмопатија, двојно гледање, хируршки третман