

## Clinical Results of Evisceration with Double Scleral Flap and Posterior Sclerotomy

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### Abstract

**Aim:** This study seeks to evaluate the clinical results observed in patients in whom we performed evisceration with double scleral flap and posterior sclerotomy.

**Method:** Data about 38 patients who had evisceration surgery with double scleral flap due to phthisis bulbi were retrospectively examined. Thereby complications likely to develop in the post-operative period such as enophthalmus, ptosis, oedema at the eyelid, lower lid laxity, ectropium, entropium, fornix dysfunction, conjunctivitis, pain, chemosis, irritation, symblepharon, conjunctival dehiscence, pyogenic granuloma, inclusion cyst, socket infection, implant exposure as well as the rate of sympathetic ophthalmia, prosthesis motility and patient satisfaction were recorded. The prosthesis motility was evaluated in five groups on the basis of four cardinal positions in the gaze directions of abduction, adduction, elevation and depression as: no motility in the prosthesis (0), motility in one direction (1+), motility in two directions (2+), motility in three directions (3+) and motility in four gaze directions (+4). Patient satisfaction, on the other hand, was evaluated in three groups as good, medium and low based on subjective assessment.

**Results:** Of 38 patients who underwent evisceration with double scleral flap technique, 19 were men and 19 women, with an overall average age of 29.1 (5 - 83). Of these patients, while 30 (78.9%) had phthisis bulbi at medium stage, 8 patients (21.2%) presented a severe one. An implant of 20 mm (76.3%) was implanted to 29 patients and one of 18 mm to 9 patients (23.7%). Implant exposure occurred only in one of 38 patients included in the study. While a prosthesis motility in four gaze directions occurred in 17 patients, a motility in three and two directions occurred in 11 and 10 patients respectively. Based on subjective cosmetic evaluation, of the patients in whom eyelash ptosis developed, while 1 patient (2.6%) expressed having low satisfaction, 8 (21.2%) and 29 (76.3%) patients said they had medium and good degree of satisfaction respectively.

**Conclusion:** Satisfactory results in respect of functional and cosmetic requirements were obtained in patients in whom evisceration technique with double scleral flap method was performed.

**Keywords:** Evisceration; Phthisis Bulbi; Double Scleral Flap; Posterior Sclerotomy

### Introduction

Evisceration is a surgical method in which all the contents of the eye are removed except for the sclera and extra ocular muscles [1]. It may be used instead of enucleation in cases of painful absolute glaucoma, traumatic eyes without scleral laceration, in cases where the reason of vision loss in medium-high degree phthisis bulbi is known and sclera is sufficient to cover the front side of the implant, in

endophthalmitis cases (especially in viral endophthalmitis) not responding to medical treatment and is characterised with total loss of vision as well as in patients in whom general anaesthesia cannot be performed [2,3].

Cornea is removed in the traditional evisceration technique [4]. This technique allows inserting a spherical implant of only 13-16 mm, but this implant size does not suffice to recover the volume loss after evisceration, thus leading to anophthalmic socket symptoms in patients. An orbital implant in proper size should be placed in order that anophthalmic enophthalmus can be prevented, and a good movement of prosthesis and a satisfactory cosmetic outcome can be achieved [5]. The sphere diameter of the most appropriate implant that can achieve this has to be 18-22 mm. For this reason, evisceration techniques with scleral relaxing incisions that allow placing implants with bigger diameters have been developed [6-10]. Thus, such a technique can allow closing the anterior sclera, Tenon's capsule and conjunctiva without tension.

The evisceration technique with scleral relaxing incisions has been defined in many different ways. This can be implemented in diverse forms such as anterior or posterior scleral approach or in vertical, horizontal or oblique meridians or in 2 or 4 quadrants or by separating or without separating the sclera from the optic nerve [6-10]. In eyes with phthisis, evisceration techniques are preferred, in which optic nerve is separated from the sclera with posterior approach and which allow especially placing implants with bigger diameters [8].

### Aim of the Study

The aim of this study is evaluate the clinical results observed in patients in whom we performed evisceration with double scleral flap and posterior sclerotomy in our clinic due to medium and high degree of phthisis bulbi.

### Method

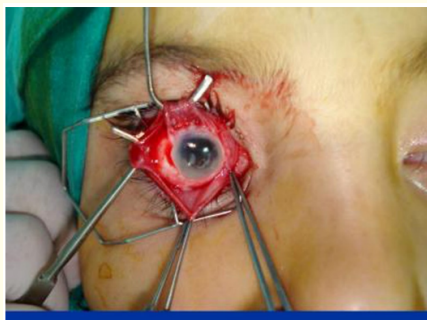
Data about 38 patients who had had evisceration surgery with double scleral flap due to phthisis bulbi were retrospectively examined. Data about 38 patients in whom evisceration surgery with double scleral flap due to phthisis bulbi was applied in our clinic were retrospectively examined. Informed consent was obtained from all the patients prior to surgical intervention.

Prior to the surgical intervention, a detailed anamnesis of the patients was completed, after which they were also subjected to a detailed eye examination, and their photos were taken as well. Eye ultrasound examination was performed to rule out the existence of any intra-ocular masses in cases where the etiology or the intra-ocular condition could not be exactly evaluated. Patients diagnosed with medium or high degree phthisis bulbi and planned for the placing of an implant of 18-20 mm in the sclera were included in the study. Those excluded from the study, on the other hand, were the patients posing a risk in respect of sympathetic ophthalmia or those having an intra-ocular mass or the ones suffering from severe ocular trauma.

### Surgical method

After, under the general anaesthesia, the area to be operated was cleaned with povidone iodine, and a retractor was fixed at the eye lids. Using a Wescott scissors, limbal peritomy was performed (Figure 1a), and bleeding areas were cauterised. By using blunt dissection, the inferior, superior, medial and lateral rectus muscles were marked with a sterile marker. The cornea was excised with a razor blade or a scissor. After performing cyclodialysis by the help of a spatula, intra-ocular tissues were removed with an evisceration spoon and an aspirator (Figure 1b). The uveal tissues remaining in the scleral cavity were denatured with a cotton swab moistened with absolute alcohol. After washing the interior of the sclera with about 50 ml serum physiologic solution, a cotton gauze swab moistened with 0.25% phenylephrine was used as tampon to help achieve haemostasis. Anterior scleral incisions at 2 - 8 o'clock quadrants were made and extended rearward up to the optic nerve. The optic nerve was separated all around from the sclera and freed. Thus, two scleral flaps were formed with an upper flap held by upper and lateral rectus and a lower one held by lower and medial rectus. After performing posterior tenotomy, an acrylic implant in appropriate size was placed (Figure 1c). Scleral flaps were sutured with 6/0 vicryl in a form one on the top of the other. Tenon and conjunctiva were sutured with 6/0 vicryl separately in two layers, and a conformer was placed between fornices

(Figure 1d). The upper and lower lids were sutured together (blepharorrhaphy) (Figure 1e). Lidocaine and bupivacaine with 4-5 ml adrenaline were injected in the retrobulber area in a 50% - 50% mixture. Applying a tight dressing, the surgery was completed. The cases with a stable socket were referred for fitting the prosthesis 6 weeks post operatively.



**Figure 1a:** Execution of 360 limbal peritomy.



**Figure 1b:** Removal of intraocular tissues.



**Figure 1c:** Placement of the acrylic implant after creating the double scleral flaps.



**Figure 1d:** Closing of tenon and conjunctiva separately.



**Figure 1e:** Execution of blepharorrhaphy.

In post-operative follow-up controls, the patients were evaluated in respect of enophthalmus, ptosis, oedema at the eyelid, lower lid laxity, ectropium, entropium, fornix dysfunction, conjunctivitis, pain, chemosis, irritation, symblepharon, conjunctival dehiscence, pyogenic granuloma, inclusion cyst, socket infection, implant exposure, sympathetic ophthalmia, prosthesis motility and patient satisfaction. The prosthesis motility was evaluated in five groups on the basis of four cardinal positions in the gaze directions of abduction, adduction, elevation and depression as: no motility in the prosthesis (0), motility in one direction (1+), motility in two directions (2+), motility in three directions (3+) and motility in four gaze directions (+4). Patient satisfaction, on the other hand, was evaluated in three groups as good, medium and low based on subjective assessment.

## Results

Of the patients included in the study, 19 were men, and 19 were women, with an overall average age of 29.1 (5-83 years of age). Of these patients, while 30 (78.9%) had a medium degree of phthisis bulbi, 8 (21.1%) suffered from a severe phthisis bulbi. Table 1 briefly summarises the primary etiologies causing phthisis bulbi. While an acrylic implant with 20 mm diameter was placed in 29 (76.3%) patients, one with 18 mm was used in 9 patients (23.7%).

Diagnosis	Number of Patients	%
Trauma	13	34,2
Endophtalmy	13	34,2
Spontaneous Perforation	5	13,1
Microcystic Eye	3	7,8
Absolute Glaucoma	2	5,2
Anophtalmic Socket Syndrome	1	2,6
Implant Exposure	1	2,6

**Table 1:** Eyes with phthisis bulbi broken down by primary etiologies.

The most frequent complications observed in the early post-operative period were oedema at the lids and chemosis. In two patients (5.2%), retrobulber haemorrhage developed in the post-operative period as a result of excessive vomiting, which led to conjunctival prolapsus. A tight dressing with cold compress was applied to these patients, as a result of which the symptoms declined. A conjunctival dehiscence was observed in three (7.8%) patients. Conjunctival saturation under local anaesthesia was applied to two patients. A case of conjunctival dehiscence developed in a small area in one patient was followed up, which later spontaneously closed. Conjunctival cysts developed in two patients (5,2%), but they were small and had no effect on the usage of a prosthesis, which required therefore no intervention. A slight conjunctival discharge occurred in 16 patients (42.1%), which recovered after the administration of topical and systemic antibiotics. A serious infection and implant exposure developed in one patient (2.6%). A second surgery was performed on this patient, removing the acrylic implant, debriding the severely infected scleral tissues and applying dermis fat graft. Surgery for upper lid retraction was performed on one patient (2.6%) due to the development of lid ptosis. A second surgery was performed on one patient (2.6%) on the ground of fornix failure, forming a fornix by way of buccal mucosal grafting. As for prosthesis motility, motility in 4 gaze directions was observed in 17 patients, motility in 3 directions in 11 patients and one in 2 directions in 10 patients (Table 2). As for the patient satisfaction from the cosmetic point of view, while one patient (2.6%) in whom a lid ptosis developed expressed low satisfaction, 8 patients (21.1%) expressed being satisfied at medium level, and 29 patients (76.3%) expressed that they were satisfied at good level in this respect.

Number of Patients	Motility	%
0	0	0
0	+1	0
10	+2	26.3
11	+3	28.9
17	+4	44.7

**Table 2:** Distribution of prosthesis motility.

### Discussion

An orbital implant in appropriate size has to be placed after evisceration in order both to avoid a volume loss likely to develop in the post-operative period and to secure a good prosthesis motility and cosmetic outcome [5]. The implant diameter has to be maximal 16 mm especially in cases where posterior sclerotomy is not performed in eyes with phthisis after evisceration.

In a first-ever application, Stephanson managed to increase the antero-posterior diameter of the sclera through incisions at the posterior sclera, a practice that made it possible to place an implant with a bigger diameter [6]. Kostick and Linberg, on the other hand, propo-

sed that the optic nerve should completely be separated from the sclera along with scleral incisions at anterior sclera [7]. However, even these techniques were far from meeting the requirements in cases when scarred scleral tissues existed, which is especially the case in patients with severe phthisis bulbi. In 2001 Massry and Holds defined a new technique, in which sclera was cut in full-thickness at 2 and 8 o'clock quadrants after the evisceration and combined around the optic nerve at the posterior side, and the optic nerve was completely separated from the sclera [8]. In this way, two scleral flaps held by extra-ocular muscles were created. Massry and Holds report that this technique makes it possible to place a sphere with a 20 mm diameter on average in patients with phthisis bulbi of medium and severe degree [8]. On the other hand, Sans Lopez and Salez Sanz modified this technique by placing four scleral flaps [11]. Comparing these three posterior sclerectomy techniques, Özey and Önder have reported that while a posterior sclerotomy technique with anterior sclera incisions at four quadrants would be more appropriate when the globe is big enough, one with double or four sclera flaps would be better in patients with phthisis bulbi of medium or severe degree [12].

As, in our study, all the patients in whom we applied evisceration had phthisis bulbi of medium or severe degree, they were all operated on using posterior sclerotomy method with double scleral flaps as described by Massry and Holds. Complications such as chemosis, oedema at the lid and conjunctival cyst, which needed no further intervention, occurred in a few patients in the early post-operative period. We had to apply saturation in two patients due to conjunctival dehiscence. One patient had to undergo a retraction operation at the upper lid on the grounds of the development of eye-lash ptosis. A second surgery for fornix reconstruction was performed on one patient due to fornix failure by using a buccal mucosal graft. Implant exposure that occurred in one patient was the most serious complication we experienced in patients included in our study. This was a patient who had previously had classical evisceration surgery due to endophthalmy with consequent implant exposure. This patient, in whom implant exposure occurred again in the first month with intensive discharge, had to undergo a second surgery in which acrylic implant was removed, debriding severely infected scleral tissues and applying dermis fat graft.

Banaz., *et al.* report that no dehiscence or exposure occurred in any of the 61 patients in whom they applied evisceration with posterior sclerotomy and scleral flaps [13]. In their study comprising 135 cases in which they applied evisceration with double scleral flap and posterior sclerotomy, Kir., *et al.* report that 5 patients experienced implant dehiscence, and that implant displacement occurred in 1 patient [14]. Apart from these, other complications reported were aponeurotic ptosis in 1 patient, deepening in upper sulcus in 3 patients, lower lid laxity in 1 patient and piogenic granuloma in 1 patient [14].

In our study we also evaluated prosthesis motility and patient satisfaction in cases an implant was placed in the eye after evisceration. Motility in 4 cardinal directions was detected in 17 patients. Furthermore, motility in 3 and 2 directions was detected in 11 and 10 patients respectively. In their study they investigated prosthesis motility and patient satisfaction after evisceration in 26 cases, Öner., *et al.* report that while prosthesis motility in 3 and 2 directions was detected in 4 and 11 patients respectively, motility in 1 direction was observed in 9 patients. On the other hand, they report observing no motility in two patients. While, in their study, 14 patients expressed being highly satisfied with the outcomes, 7 patients had medium and 5 low satisfaction [15]. As for the satisfaction levels in our study, while 29 patients expressed good satisfaction, 8 patients said they were satisfied at medium degree and 1 at low degree. The patient who expressed low satisfaction was the one in whom eyelash ptosis had developed and had therefore a surgery for upper lid retraction to overcome the cosmetic problem.

### Conclusion

Our study concludes that satisfactory results in respect of functional and cosmetic requirements can be obtained with evisceration technique with double scleral flap. Besides, the results show that minimal complications occur after evisceration with double scleral method, and these complications can be taken under control by means of medical or surgical treatment.

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