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Case Report

Scleral Flap Wound Dehiscence with Valsalva Maneuver After Trabeculectomy with Mitomycin C

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Abstract

Incisional surgeries such as trabeculectomy reduce the resistance of the eye to trauma. Trabeculectomy is often performed together with mitomycin C, and late onset hypotony is already an expected complication in these eyes. This case report presents a patient who developed dehiscence of the scleral flap and hypotony maculopathy after Valsalva maneuver after 5.5 years of trabeculectomy. In a 6-month period, the patient's hypotonic maculopathy became evident, and vision was affected after this period. Thereupon, the wound site was explored, and dehiscence of the scleral flap at the temporal wound site and increased aqueous outflow were detected. Repair was done with sterile pericardium patch. Post-operative vision, intraocular pressure, and hypotony maculopathy recovered very quickly. After incisional surgeries, patients should be warned against both external trauma and minor traumas such as eye rubbing and Valsalva maneuver.

Keywords: Glaucoma, hypotony maculopathy, scleral flap dehiscence, trabeculectomy

Introduction

In trabeculectomy performed with mitomycin C, the rate of bleb leakage in the late period is 5–30% (1). On examination, positive Seidel test, low intraocular pressure (IOP), corneal folds, flattening of the anterior chamber, optic disc edema, retinal and choroidal folds with signs of hypotony maculopathy, and loss of visual function may be detected (2). The rate of incidence of hypotony maculopathy after glaucoma filtering surgery is between 1.3% and 18% (3,4). Hypotony maculopathy is a serious vision-threatening complication, especially when it lasts for a long time.

Findings such as scleral rupture and scleral flap separation, which occur as a result of external trauma in patients who have undergone trabeculectomy have been reported (5,6). However, as far as, we know, dehiscence of the scleral flap from the marginal wound site and development of hypotony after the Valsalva maneuver have not been reported in the literature.

In this case report, our aim is to present a patient who developed dehiscence of the scleral flap and hypotony maculopathy following Valsalva maneuver 5.5 years after trabeculectomy and to emphasize the importance of warning patients undergoing incisional surgery about such maneuvers and minor/major trauma.

Case Report

Written informed consent for patient information and images to be published was provided by the patient. A 31-year-old female patient has been followed in our uvea-glaucoma clinic for about 10 years. The patient had herpetic uveitis and ocular hypertension in the left eye. She had undergone

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trabeculectomy surgery with mitomycin C (0.2 mg/ml for 2 min) in the left eye about 7 years ago and had phacoemulsification and intraocular lens implantation in the same eye 1 year after trabeculectomy. After trabeculectomy, IOP in the left eye remained at 10–12 mmHg and even with herpetic activation, IOP did not increase at all. She had last attack of herpetic keratitis and iridocyclitis 2 years ago.

The patient applied to our clinic 18 months ago with blurred vision in the left eye. She was using valacyclovir 500 mg once a day. The patient's visual acuity was 1.0 in both eyes (Right: –1.75 D; Left: –0.75 D). Right IOP was 19 mmHg, and right anterior and posterior segment examinations were completely normal. Left IOP measured by Goldmann applanation tonometry was 7 mmHg. Left cornea and anterior segment were normal. Seidel test was negative in the trabeculectomy bleb area. Dilated fundus examination was also normal in the left eye. When the patient was questioned for any trauma or eye rubbing, she stated that she had sinusitis, because she felt fullness in the ear, she performed the Valsalva maneuver by covering her nose with her hand 2 times about 1 h ago. The complaints in her eye started after this maneuver.

The patient was warned not to do the Valsalva maneuver again and was checked every other day for close follow-up. In the 1st month, the refraction was +1.00 D in the left eye and the IOP was 6 mmHg, choroidal folds and optic disc edema were formed on the dilated fundus examination. The patient's trabeculectomy site was macrocystic and intact (Fig. 1a). Seidel test was still negative in the trabeculectomy bleb area. The patient was offered surgery to control the site and repair a possible scleral flap or wound tear. However, it was explained that IOP may rise again after the operation and secondary glaucoma surgery may be required. The patient refused to have surgery, because her vision did not decrease and due to the COVID-19 pandemic. The patient was examined regularly for 6 months. During this period, the left visual acuity did not decrease, and IOP remained at the level of 5–6 mmHg. However, after 6 months, the signs of hypotonic maculopathy increased dramatically (Fig. 1b).

Spectral-domain optical coherence tomography (OCT) demonstrated the peripapillary retinal nerve fiber layer-thickened consistently with the thickening of the neuroretinal rim (Cirrus HD-OCT; Carl Zeiss Meditec, Dublin, CA) (Fig. 1c) and the chorioretinal folds in the macula (Spectralis SD-OCT,

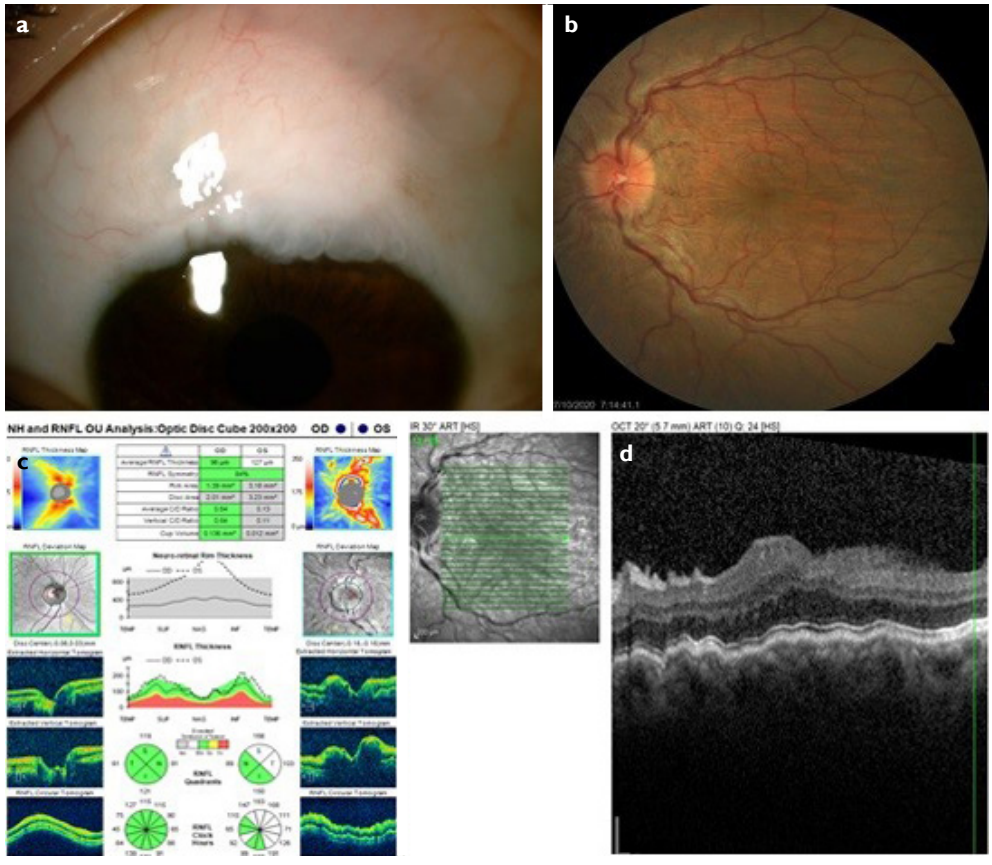

Figure 1. Pre-operative anterior segment, fundus, optic disc, and macular optical coherence tomography (OCT) images. In the first picture, it is seen that the trabeculectomy area is intact and there is no hyperemia **(a)**. Left fundus image **(b)** shows optic disc edema and chorioretinal folds, optic disc OCT **(c)** shows left optic disc edema and macular OCT **(d)** shows chorioretinal folds.

Heidelberg Engineering, Germany) (Fig. 1d). Hypermetropic shift also became evident. When the visual acuity decreased to 0.8 with a refraction of +2.00 D in the left eye, all possible risks were explained to the patient and surgery was recommended again and the patient accepted the operation in the 8th month.

Under general anesthesia, after disinfection with 1% povidone-iodine solution, horizontal limbal peritomy incision was done in the superior conjunctiva. When the conjunctiva was gently dissected at the trabeculectomy site, dehiscence of the scleral flap was detected in the temporal margin of the triangular flap (Fig. 2a). Leakage was checked by filling the anterior chamber with balanced salt solution from the paracentesis. Significant aqueous leakage from the dehiscent area was detected (Fig. 2b).

The sterile pericardium graft (Edwards Lifesciences, USA) which was cut to fit the dehiscent area (Fig. 2c) and obtained as thinner half layer, was sutured to this area with 10.0 nylon (Fig. 2d). While suturing the conjunctiva, the macrocystic marginal region was found to be very thin and was excised and sutured with an interlocked suture to the limbus using 10/0 nylon.

Postoperatively, moxifloxacin drops 5 times a day, prednisolone acetate 5 times a day, and valacyclovir tablet 2000 mg/day were started. While moxifloxacin was discontinued in 10 days, steroid and valacyclovir treatment was gradually reduced. In the 1st month of the surgery, the visual acuity in the left eye was 1.0 with a correction of –0.75 D, and the IOP was 14 mmHg. In the anterior segment examination, conjunctival bleb was formed in the operation area, Seidel test was negative, and cornea and anterior chamber were normal (Fig. 3a). In dilated fundus examination, decreased disc edema and depth of the choroidal folds were detected (Fig. 3b). In 6th month follow-up, the IOP was 15 mmHg, and anterior segment examinations were normal. In dilated fundus examination, optic disc was normal, and the choroidal folds were largely absent. Optic disc edema and choroidal folds improvement was observed in disc and macula OCT (Fig. 3c, d). Valacyclovir 500 mg once daily maintenance therapy was discontinued.

Discussion

In this case report, we present the dehiscence of the scleral flap from the incision margin after the Valsalva maneuver in a patient who had undergone trabeculectomy with mitomycin C. It took approximately 6 months for the hypotonic maculopathy that developed in the patient to affect vision and cause significant hyperopia. The eye could have been repaired earlier, but as the vision was not affected and due to the pandemic conditions, the surgery could be performed in the 8th month. In the surgery, the rupture area was repaired by placing a human pericardial graft. Shortly after surgery, vision improved, IOP returned to normal values, and hypotonic maculopathy improved dramatically. The trabeculectomy operation remained successful, because only the area with excess aqueous solution was repaired.

Shah and Clarke described a case with a history of bilateral trabeculectomy augmented with mitomycin C underwent surgery for a scleral rupture following trauma (5). The site of the rupture was the posterior extension of the scleral flap. Persistent hypotony due to over drainage was treated by patching the site with a donor pericardium graft. The rup-

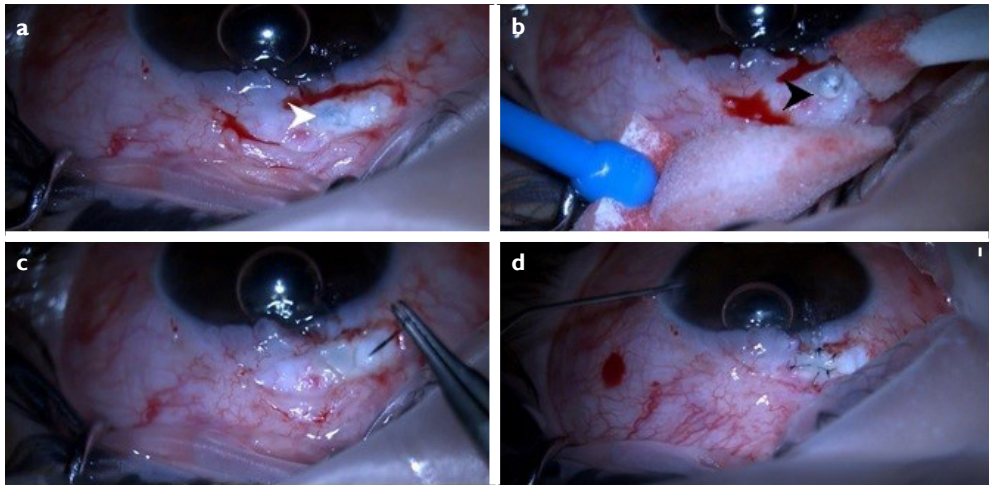

Figure 2. Trabeculectomy area view during surgery. The first picture shows (white arrow head) the dehiscent at the temporal edge of the triangular flap **(a)**. When the anterior chamber was filled with balanced salt solution from the paracentesis site, there is significant aqueous leakage (black arrow head) from the dehiscent area **(b)**. A pericardial patch graft was placed in the dehiscent area **(c)** and sutured with 10.0 nylon **(d).**

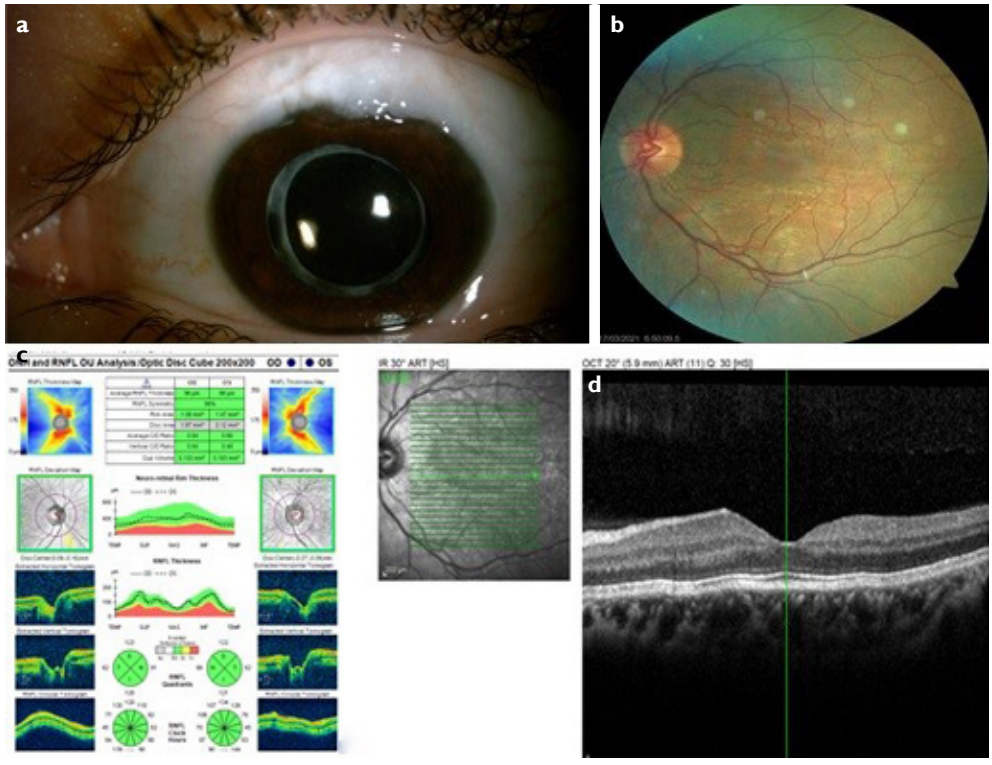

Figure 3. Post-operative 6th month images of anterior segment, fundus, optic disc, and macular optical coherence tomography (OCT). In the first picture, it is seen that the trabeculectomy area is intact **(a)**. In fundus image, optic disc was normal, and the chorioretinal folds were largely absent. Optic disc OCT **(c)** shows normal optic disc and macular OCT **(d)** is close to normal.

ture area in this case was larger than our case, and therefore, the graft area was larger. Therefore, in the post-operative period, the trabeculectomy became non-functional and secondary glaucoma surgery was required. In the literature, there are reported cases, in which scleral laceration extended posteriorly or complete wound dehiscence of the scleral flap developed in eyes that underwent trabeculectomy after trauma (6,7). When conservative treatment could be performed, the function of trabeculectomy could continue (6).

In our case, the trauma was not external, but was associated with the Valsalva maneuver. In fact, although it is more innocent than external trauma, the disruption of wound integrity due to incisional surgery caused excessive aqueous outflow that caused hypotonia. Moreover, the fact that incisional surgery was performed together with an antimetabolite increased the risk of dehiscence. Bleb rupture was also reported in a patient who had previously undergone trabeculectomy with mitomycin C, with minimal trauma caused by eye rubbing (8).

When investigating whether scleral flap shape is associated with trauma-related flap ruptures, of the studies with post-traumatic scleral rupture and dehiscence, (5,6) only Zeiter and Shin's study (7) indicated the shape of the scleral flap as a triangle. Already, triangular and rectangular scleral flaps were found to be equally effective after trabeculectomy surgery in terms of IOP control, bleb characteristics, and complications (9).

The use of mitomycin C during trabeculectomy has become almost routine to prevent development of post-operative fibrosis increasing the probability of a successful outcome (10). In trabeculectomy, particularly performed using antimetabolites, care should be taken in terms of complications such as spontaneous bleb leakage and scleral melting in the late period, and patients should be warned. There may be obvious conjunctival leakage with a positive Seidel test or diffuse and possibly unnoticeable leakage through thin and transparent tissue, described as oozing (11). In addition to bleb leaks, overfiltration is a common cause of excessively low pressures (12). Hypotony should be followed closely and treated urgently in cases where vision is threatened. Hypotony leads to cataract formation and corneal decompensation (10,13). Macular striae, choroidal folds, choroidal detachment, vessel tortuosity, and disc swelling can be seen in hypotony maculopathy. The time of hypotonia to affect vision is variable (14).

Whether it is trauma related or not, the aim in late onset hypotony is to repair the leaking area and to prevent permanent vision loss from hypotony or hypotony macu-

lopathy. However, the function of trabeculectomy should be preserved during this repair. Although non-surgical methods such as acetazolamide intake, pressure patching, bandage contact lens, and injection of autologous blood are applied, surgical repair is usually required (15-18). Surgery is planned according to where the defect is. Conjunctival advancement with or without excision of the pre-existing bleb, free conjunctival or amniotic membrane grafts, scleral flap re-suturing, patch grafting with donor pericardium or sclera, placement of compression sutures, and transconjunctival suturing of the scleral flap is the described methods (5,19-25). In this case, pericardial graft (Edwards Lifesciences, USA) was used during the surgical repair.

In conclusion, in this case report, we present scleral wound dehiscence after Valsalva maneuver and subsequent hypotony maculopathy in a patient who underwent trabeculectomy with mitomycin C. Trabeculectomy itself and the use of antimetabolites make tissues more fragile. Therefore, the antimetabolites should be used by paying close attention to the duration and dose. In addition, patients should be warned against both major and minor traumas such as eye rubbing or Valsalva maneuver.

Disclosures

Informed consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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Conflict of Interest: None declared.

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