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Risk factors and prognosis in patients with suprachoroidal hemorrhage

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Abstract

The aim of the present study is to evaluate the risk factors and prognosis after treatment in patients followed up for suprachoroidal hemorrhage (SCH). Six eyes of 6 patients who were followed up and treated for SCH between May 2016 and December 2021 were included in this study. All patients' risk factors, treatment, visual acuity and the anatomical result were evaluated separately. While 4 (66.7%) of the patients were male and 2 (33.3%) were female, the mean age of the patients was 72.5±12.5 years. There was a history of hypertension in 2 patients and a history of glaucoma in 3 patients. Surgery was performed under general anesthesia in 5 patients and under local anesthesia in 1 patient. While intraoperative SCH development was observed in four patients, SCH developed in 2 patients during the postoperative period. While hemorrhage drainage and pars plana vitrectomy were combined in one patient, 5 patients received only medical treatment. In the follow-up period, two patients had no perception of light, and one of these patients underwent evisceration. Perception of light was positive in one patient and anatomical integrity was preserved. The visual and anatomical results to be obtained from patients with SCH vary according to the severity of the situation, and very encouraging results cannot be obtained. The main strategy here is to prevent the development of SCH, and for this purpose, optimal precautions should be taken before, during and after surgery.

Keywords: Prognosis, risk factors, suprachoroidal hemorrhage

Introduction

Suprachoroidal hemorrhage (SCH), defined as bleeding occurring in the suprachoroidal space, is one of the most serious and sight-threatening complications encountered in ophthalmic surgery [1]. SCH does not only occur as a complication of an ocular surgery, but can also be seen after trauma or spontaneously [2]. Although its frequency varies according to the type of surgery performed, it has been reported in the literature to vary between 0.04% and 1% [2]. SCH can be classified in different ways according to the time of onset and prevalence. While it is classified as intraoperative, expulsive SCH and postoperative delayed SCH according to the onset time, it is classified as focal or diffuse according to the extent [3].

There are different systemic and ocular risk factors for the development of suprachoroidal hemorrhage. While advanced age, hypertension and use of anticoagulants are the leading systemic risk factors, glaucoma, aphakia and axial myopia are the leading ocular risk factors [4]. However, sudden hypotonia, Valsalva maneuver and vitreous loss in anterior segment surgeries are among the most important intraoperative risk factors. Visual prognosis is not good in massive SCH cases, especially in intraoperative cases, and some cases may result in phthisis [5]. The aim of the present study is to evaluate the risk factors and the prognosis after treatment in the cases followed for SCH in the light of the literature.

Material and Methods

Before the study, necessary ethical permissions were obtained from Mersin University Clinical Research Ethics Committee and this study was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all patients. Six eyes of 6 patients who were followed up and treated for SCH between May 2016 and December 2021 in Department of Ophthalmology, Faculty of Medicine, Mersin University were included in this study. All patients' risk factors, treatment, visual acuity and anatomical result were evaluated separately.

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Results

Of the patients included in this study, 4 (66.7%) were male and 2 (33.3%) were female. The mean age of the patients was 72.5±12.5 years (53-83 years), while the mean follow-up period was 26.5±25.2 months (5-72 months). When the histories of the patients were evaluated, one patient had hypertension, one patient had hypertension together with diabetes mellitus, coronary artery disease and a history of anticoagulant use. Three patients had a history of glaucoma.

Table 1. Summary of cases followed up and treated for suprachoroidal hemorrhage

	Gender	Age	Systemic disease	Ocular disease/ surgery	Risk Factors	Indications/Surgery	Treatment	Final Visual Acuity
Patient 1	Male	53	-	Complicated cataract surgery, SFIOL implantation and PPV, Glaucoma	Hypotonia	Bullous keratopathy/ PK	Intraoperative drainage, corneal suturing	No perception of light/Evisceration
Patient 2	Female	83	-	Glaucoma	Anesthesia device failure	Cataract/ECCE+IOL implantation	Topical and systemic steroid	Perception of light/ Anatomical integrity preserved
Patient 3	Male	61	-	Uncomplicated cataract surgery, T-IOL implantation	Anesthesia device failure, Valsalva maneuver	RRD / PPV	Topical steroid	0.7/After silicone oil removal
Patient 4	Male	77	Hypertension	Glaucoma	Postoperative wound site leakage	IOL drop/PPV+ SFIOL implantation	Wound suturing, topical and systemic steroids	0.3/After suture removal
Patient 5	Female	79	-	PK	Valsalva maneuver due to severe cough	Corneal suture removal	Removal of intraocular tissues, wound suturing	No perception of light/Phthisis
Patient 6	Male	82	Hypertension, DM, CAD, Anticoagulant use	Glaucoma	Vitreous loss	Cataract/ PHACO+ IOL implantation	Hemorrhage drainage, PPV	Evisceration

The mean axial length measurements of the patients were 24.27±0.89mm (23.56-26.02mm). Surgery was performed under general anesthesia in 5 patients and under local anesthesia in one patient.

While intraoperative SCH development was observed in four patients (Figure-1), SCH developed in 2 patients in the postoperative period. Spontaneous development was observed in 2 of the intraoperative cases, while SCH developed due to hypertension attack due to anesthesia device failure or Valsalva maneuver in 2 cases.

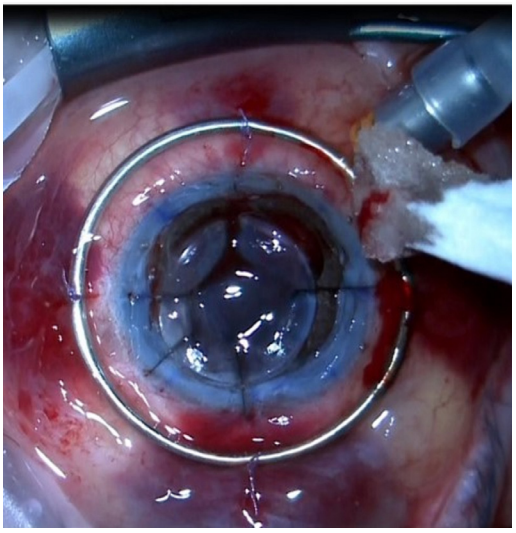

Figure 1. Intraoperative view of the patient who developed SCH during penetrating keratoplasty, drainage was performed in the same time in order to perform wound suturing in this case (Patient 1).

Postoperative SCH developed in one of the cases due to severe cough after removal of the keratoplasty sutures (Figure 2), and in the other due to hypotonia caused by leakage at the wound site (Table 1). While hemorrhage drainage and pars plana vitrectomy (PPV) were combined in one patient (Figure 3), only medical treatment was received to 5 patients (Figure 4). Topical cyclopentolate was used together with topical steroid in medical treatment, and when necessary, topical antiglaucomatous drugs and systemic steroids were added to the medications. In the follow-ups, two patients had no perception of light, and one of these patients underwent evisceration. Perception of light was positive in one patient and anatomical integrity was preserved. In the patient who underwent surgical drainage, bullous keratopathy and retinal detachment were observed in the follow-up, but the patient did not accept additional surgery (Table 1).

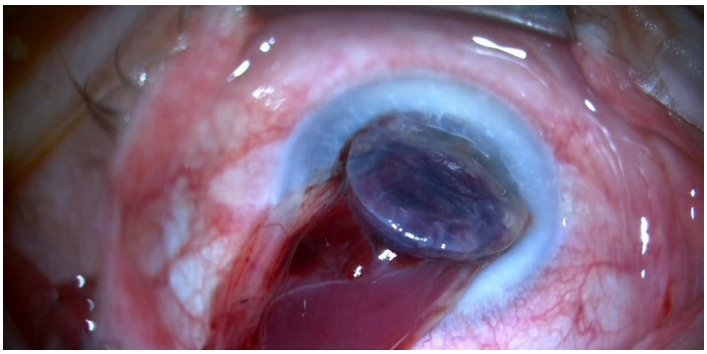

Figure 2. After the removal of keratoplasty sutures, the view of the patient who developed expulsive hemorrhage due to severe cough, intraocular tissues were cleaned and wound sutured was performed (Patient 5).

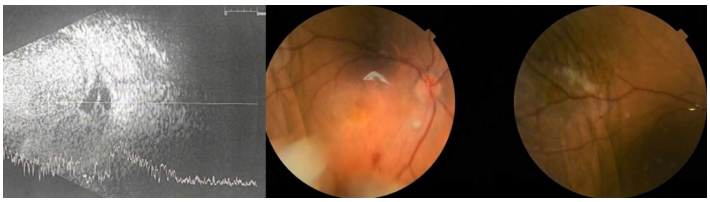

Figure 3. Preoperative ultrasonography view of the case who underwent vitrectomy with hemorrhage drainage and fundus view after surgery. Subretinal hyperechoic lesions affecting the upper and lower divisions caused contact "kissing choroid". A small vitreous is distinguished between the lesions (Patient 6)

Figure 4. Pre- and post-treatment ultrasonography images of the case who received only medical treatment. On the left, there are subretinal hyperechoic lesions in two different regions that have just started. In the middle, these lesions are partially reduced and "contact" is lost. On the right, the lesions are completely regressed and the anatomical structure is normal (Patient 2)

Discussion

Age is the leading risk factor for the development of suprachoroidal hemorrhage, and its incidence increases in elderly patients. The main reason for this is the atherosclerotic changes that occur in the short and long posterior ciliary arteries with aging. Due to these changes, vessels can easily rupture and SCH may develop [6]. Although many studies have found that the mean age of patients with SCH is 60 and over, reported that it can also be seen in young patients with additional risk factors [7]. In the presented study, the mean age of the patients who developed SCH was found to be 72.5 years, and this result is consistent with the literature.

Apart from age, systemic hypertension, widespread atherosclerosis, use of anticoagulants, systemic diseases that may cause bleeding diathesis, increase in intraoperative heart rate and intraoperative Valsalva maneuver are among the important systemic risk factors for the development of SCH [7]. In this study, hypertension was noted in two patients, while one patient had a history of anticoagulant use. For this reason, all patients, especially elderly patients, should be systematically questioned in detail, and when necessary, the patient should be prepared for surgery with a multidisciplinary team. In addition, careful control of the anesthesia device equipment before the surgery and close monitoring of the patient during the surgery are of great importance in surgeries performed under general anesthesia. In the presented study, SCH development was observed in two cases due to a failure of the anesthesia device or the Valsalva maneuver due to awakening of the patient.

In addition, in one patient, the wound site was opened due to severe cough following the removal of the keratoplasty sutures, and observed that expulsive hemorrhage developed with the resulting Valsalva maneuver.

Another important condition that should be carefully questioned in patients is the history of accompanying ocular disease or previous ocular surgery. Glaucoma and high intraocular pressure before surgery are among the important risk factors for the development of SCH [8]. Vascular necrosis caused by high pressure has been suggested as a possible risk factor in patients with glaucoma6. In the present study, three patients had a history of glaucoma, while one patient had high intraocular pressure. For this reason, intraocular pressure control of the patients should be done carefully before surgery, and if necessary, the pressure should be reduced with the help of hyperosmotic agents before surgery. In addition, previous studies have reported that intraocular surgeries are a risk factor for the development of SCH [9,10].

If intraocular surgery is planned, especially in patients who have had a previous vitrectomy, fluctuations and sudden decreases in intraocular pressure during surgery should be avoided. In the present study, one patient had a history of vitrectomy and despite all the precautions taken during penetrating keratoplasty, the development of SCH was observed.

Other eye-related risk factors are axial myopia and aphakia. While aphakia is an important risk factor especially for patients who are planned for penetrating keratoplasty, it has been reported that an axial length greater than 25.8mm creates a risk for the development of SCH [10]. The main reason for this is thought to be poor scleral rigidity and increased choroidal vascular fragility. In the present study, observed that the axial length was above this value in only one patient.

One of the most important risk factors for suprachoroidal hemorrhage is the development of intraoperative sudden hypotonia. Sudden hypotonia causes choroidal effusion and then the long and short ciliary arteries are stretched and ruptured [11]. This situation may develop intraoperatively, as well as in postoperative hypotonia, especially in glaucoma surgeries [12]. In one case in this study, SCH development was observed due to wound site leakage that occurred in the postoperative period. However, another important risk factor for the same case is previous vitrectomy. Therefore, hypotonia should be avoided in all intraocular surgeries, both in the intraoperative and postoperative periods. In addition to all these, it should not be forgotten that the most important factor in the development of sudden hypotonia is the width of the incision site. Today, with the developing technologies, many intraocular surgeries can be performed through small incisions and this risk is tried to be reduced.

In the treatment of suprachoroidal hemorrhage, observation or surgical drainage of the hemorrhage can be performed together with medical treatment [11]. In medical treatment, cyclopentolate with topical steroids and, when necessary, systemic steroids together with topical and systemic antiglaucomatous agents can be used. The most appropriate time for drainage of hemorrhage is generally accepted as 7-14 days, and combined with vitrectomy in necessary cases [11]. In the present study, surgery was performed in only one case, and the other cases were followed up with medical treatment.

Studies have reported that visual acuity develops at or below the level of counting fingers in most of the patients who develop SCH[4]. It is even known that in some cases there is no perception of light. In the presented study, observed that there was no perception of light in two cases and evisceration was performed to one of them, while the anatomical integrity was preserved in the other case. However, good vision was achieved in two patients. This result is related to the level of SCH development, and similar results have been reported in the literature [4].

Limitations of this study; due to the rare of the disease, relatively few patients are included, a short follow-up period and a single center experience. Randomized controlled studies with a larger number of patients and longer follow-up are needed in the future.

Conclusion

In conclusion, SCI is a very serious complication, and the visual and anatomical results to be obtained from these patients vary according to the severity of the situation, and very encouraging results cannot be obtained. The main strategy here is to prevent the development of SCH, and for this purpose, optimal precautions should be taken before, during and after surgery.

Conflict of interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that they have received no financial support for the study.

Ethical approval
Before the study, necessary ethical permissions were obtained from Mersin University Clinical Research Ethics Committee and this study was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all patients.(06/04/2022).

References

1. Moshfeghi DM, Kim BY, Kaiser PK, et al. Appositional suprachoroidal hemorrhage: a case-control study. Am J Ophthalmol 2004;138:959–3.
2. Boral SK, Agarwal D. Modified posterior drainage of post-operative suprachoroidal hemorrhage. Indian J Ophthalmol. 2021;69:3584-90.
3. Mo B, Li SF, Liu Y,et al. Suprachoroidal hemorrhage associated with pars plana vitrectomy. BMC Ophthalmol. 2021;21:295.
4. Dockery PW, Joubert K, Parker JS, Parker JS. Suprachoroidal hemorrhage during descemet membrane endothelial keratoplasty. Cornea. 2020;39:376-8.
5. Wang LC, Yang CM, Yang CH, et al. Clinical characteristics and visual outcome of non-traumatic suprachoroidal hemorrhage in Taiwan. Acta Ophthalmol. 2008;86:908–12.
6. Chu TG, Green RL. Suprachoroidal hemorrhage. Surv Ophthalmol . 1999;43:471–86.
7. Bandivadekar P, Gupta S, Sharma N. Intraoperative suprachoroidal hemorrhage after penetrating keratoplasty: case series and review of literature. Eye Contact Lens. 2016;42:206-10.
8. Ling R, Kamalarajah S, Cole M, et al. Suprachoroidal hemorrhage complicating cataract surgery in the UK: A case control study of risk factors. Br J Ophthalmol. 2004;88:474–7.
9. Moshfeghi DM, Kim BY, Kaiser PK, et al. Appositional suprachoroidal hemorrhage: A case-control study. Am J Ophthalmol. 2004;138:959–63.
10. Speaker MG, Guerriero PN, Met JA,et al. A case-control study of risk factors for intraoperative suprachoroidal expulsive hemorrhage. Ophthalmology. 1991;98:202–9.
11. Learned D, Eliott D. Management of delayed suprachoroidal hemorrhage after glacouma surgery. Semin Ophthalmol. 2018;33:59-63.
12. Jin W, Xing Y, Xu Y, et al. Management of delayed suprachoriodal haemorrhage after intraocular surgery and trauma. Graefe's Archive Clin Exp Ophthalmol. 2014;252:1189–93.