CASE REPORT

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# Secondary surgical management of suprachoroidal hemorrhage during *pars plana* vitrectomy

## Sekundarno hirurško rešavanje suprahoroidalne hemoragije nastale u toku *pars plana* vitrektomije

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**Abstract**

**Introduction.** Suprachoroidal hemorrhage (SCH) is one of the most feared and devastating complications of intraocular surgery. Intraoperative SCH is defined as sudden hemorrhagic swelling of the choroid which develops at time of intraocular surgery, and is associated with expulsion of some or all of the intraocular contents. **Case report.** A 56-year-old man was admitted to our Clinic with bullose retinal detachment in the left eye. Intraoperatively, during the substitution of perfluorocarbone liquid (PFCL) with silicone oil, which is very rare situation, a sudden loss of red reflex happened and SCH was recognized as the cause. No attempt was made to drain the suprachoroidal blood. After 3 weeks the patient was scheduled for *pars plana* vitrectomy. Initial drainage of liqufied blood was made through a sclerotomy port during *pars plana* inferotemporally. Massive epiretinal proliferation with funnel shaped retinal detachment was solved during vitrectomy and internal tamponade with silicone oil was done. Postoperative visual aquity was 2/60 on the third postoperative day. **Conclusion.** Although suprachoroidal hemorrhage is one of most feared and devastating complications of intraocular surgery, it might have relatively good prognosis with proper preoperative, intraoperative and postoperative management.

**Key words:**
**vitrectomy; eye hemorrhage; intraoperative complications; risk factors.**

**Apstrakt**

**Uvod.** Suprahoroidalna hemoragija (SH) je komplikacija koje se najviše plašimo i koja je najrazornija u intraokularnoj hirurgiji. Intraoperativna SH definiše se kao iznenadni hemoragični otok horoidee koji se razvija tokom intraokularne operacije i koji je udružen sa delimičnim ili potpunim prolapsom intraokularnog sadržaja. **Prikaz bolesnika.** Muškarac, star 56 godina primljen je na našu kliniku sa buloznom ablacijom retine na levom oku. Intraoperativno, u toku izmene perfluorokarbona za silikonsko ulje, što se vrlo retko viđa, došlo je do iznenadnog gubitka crvenog refleksa, što je bila pojava SH. Nismo pokušali drenažu SH. Odlučili smo da bolesniku zakažemo vitrektomiju za tri nedelje. Početnu drenažu likveficirane SH uradili smo kroz preegzistirajuću standardnu *pars plana* sklerotomiju inferotemporalno. Masivna epiretinalna proliferacija sa levkastom ablacijom retine rešena je u toku vitrektomije i urađena je endotamponada sa silikonskim uljem. Postoperativni vizus bio je 2/60 trećeg postoperativnog dana. **Zaključak.** Iako je suprahoroidalna hemoragija komplikacija koje se najviše plašimo i koja je najrazornija u intraokularnoj hirurgiji, sa adekvatnim preoperativnim, intraoperativnim i postoperativnim tretmanom može, ipak, imati relativno dobru prognozu.

**Ključne reči:**
**vitrektomija; oko, krvarenje; inraoperativne komplikacije; faktori rizika.**

### Introduction

Suprachoroidal hemorrhage (SCH) is a rare but dangerous complication of intraocular surgery [1]. SCH is defined as sudden hemorrhagic swelling of the choroid which develops at the time of intraocular surgery, which if associated with expulsion of some or all of the intraocular contents. SCH itself may be bad prognostic sign for postoperative outcome.

In myopic patients, SCH occurs in situations when the fragile vasculature is put under additional stress such as intraocular surgery [2]. We reported intraoperative and secondary surgical management of SCH during *pars plana* vitrectomy in the eye with rhegmatogenous retinal detachment.

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**Case report**

A 56-year-old man was admitted to our Clinic complaining of a 3-day history of decreased visual acuity in the left eye, followed by an episode of complete loss of vision in the inferior part of the visual field. He had no history of hypertension or diabetes, no previous operations or allergies, and no history of eye disease or trauma.

His axial lengths were 25.36 mm right and 25.37 mm left. His visual acuity in the right eye was 1.0 through a pinhole. The left eye's visual acuity was 1/60. The intraocular pressures were 19 mmHg in the right and 20 mmHg in the left. On fundoscopy he had extensive peripapillary atrophy and a myopic looking disc as well as several retinal tears located at 4, 5 and 8 o'clock accompanied with multiple areas of chorioretinal atrophy. Fundoscopy of his left eye revealed bullose retinal detachment with multiple retinal tears and chorioretinal degeneration. We decided to perform *pars plana* vitrectomy and tamponade with silicon oil.

We placed scleral buckle under the all rectus muscles, and then we made sclerotomies at 11, 2 and 4 o'clock and placed infusion cannula. Then *pars plana* vitrectomy was made, installation of perfluorocarbon liquid (PFCL) and endolaserphotocoagulation.

Intraoperatively, during the substitution of PFCL with silicone oil, shallowing of the anterior chamber was noticed, silicon oil mixed with PFCL started prolapsing through sclerotomies, there was a sudden loss of red glow and SCH was recognized as the cause. We used vacuum needle to drain as much of the remained PFCL and silicone oil as we could. Sclerothomies were closed, the infusion cannula was removed. No attempt was made to drain the suprachoroidal blood. The patient was started on topical corticosteroids along with anti-glaucoma medication. Ultrasound examination confirmed the diagnosis of hemorrhagic choroidal detachment with the prominency of 13.26 mm and vitreous hemorrhage mixed with the silicone oil. Vitreoretinal surgery was planned when liquefaction of blood in the suprachoroidal space happened, and not before two weeks after the SCH occurred.

After 3 weeks the patient was scheduled for *pars plana* vitrectomy. When admitted he had visual acuity in the operated eye of light perception with intraocular pressure (IOP) at 1 mmHg and advanced cataract. There was no fundal reflex. An ultrasound examination confirmed the decrease of hemorrhagic choroidal detachment to 5.36 mm accompanied with total retinal detachment.

Then a standard *pars plana* vitrectomy port was made at the *pars plana* inferotemporally. Dark red, liqufied blood gushed out. Once drainage from this site was completed, two other ports were made superonasally and superotemporally, at 10 and 2 o'clock.

The infusion cannula was placed through the standard *pars plana* site. Due to advanced cataract we had to perform lensectomy. Further limited vitrectomy and membranectomy was done to remove vitreous hemorrhage, membranes and proliferations, taking care to avoid the anteriorly displaced retina and choroid. When the visibility improved, we noticed incarceration of the retina in the wound so we had to perform retinectomy in order to release incarcerated retina.

When the media became clear, residual choroidal swellings were observed. PFC2 was instilled over the posterior pole, leading to further drainage of blood from the port sites. Photocoagulation with endolaser was performed. PFCL was then completely removed and substituted with silicon oil.

Postoperatively the retina was attached and patient had the best corrected visual acuity of 2/60 at the time of discharge 3 days later (Figure 1). With correction the vision after 4 weeks visual acuity was 4/60.

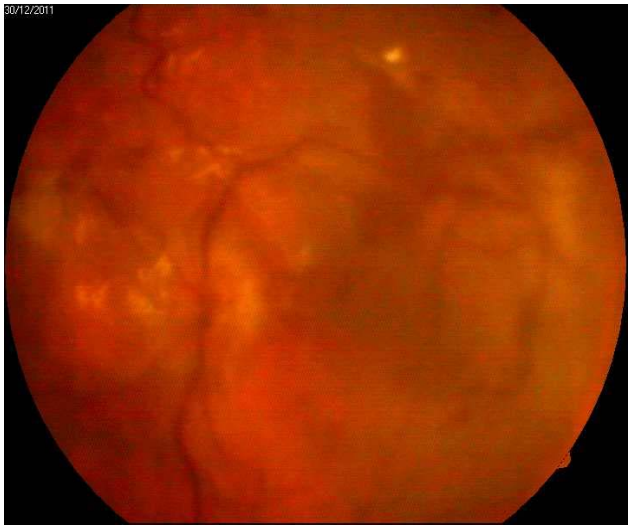


**Fig. 1 – Fundus of the left eye 3 days after the surgery for suprachoroidal hemorrhage.**

**Discussion**

Intraoperative SCH is defined as a sudden hemorrhagic swelling of the choroid which develops at the time of intraocular surgery, which if associated with expulsion of some or all of the intraocular contents [3]. Various studies have focused on identifying patients at risk and reduction of risk factors help to reduce the incidence [4]. Myopia is a risk factor for suprachoroidal hemorrhage because the longer axial length causes increased choroidal vascular fragility [5]. This case illustrates how myopia associated with choroidal vasculature fragility could cause intraoperative hemorrhage.

Some investigators have come to a conclusion that SCH itself is not prognostic sign of bad postoperative outcome and that some eyes may recover with useful visual acuity if proper intraoperative and secondary surgical management is conducted [6, 7].

Special attention should be paid in cases with risk factors for expulsive SCH. Risk factors for the development of intraoperative SCH during *paps plana* vitrectomy are high myopia, previous retinal detachment (RD) surgery, rhegmatogenous RD, cryotherapy, scleral buckling, external drainage of subretinal fluid, and intraoperative systemic hypertension [8]. Intraoperative, early recognition and immediate surgical

response are crucial for postoperative outcome. Intraoperatively early recognization and immediate rapid closure of the wound is important. Prolapsed intraocular contents should be reposited as quickly as possible; if this is not possible the eye can be softened by performing posterior sclerotomies [9]. If SCH happens during PFCL-silicon oil exchange (due to low IOP caused by inadvertent tubing occlusion) we think that evacuation of as much as possible silicon oil is crucial. Evacuation should be done through open sclerotomies.

Is it a good idea to make sclerotomies during an acute event? We believe that making sclerotomies during the acute event may be detrimental to eyes. Lakhanpal [10] showed in his study that the tamponading effect of raised IOP could be unsettled due to ooze through the sclerotomies and could cause re-bleed. Once acute MSCH is recognized intraoperatively, surgical decompression at that time should be avoided as MSCH itself may tamponade the choroidal bleed.

In the rabbit model of SCH, sclerotomy resulted in the marked extension of SCH. Intraoperative sclerotomy cannot therefore be recommended. Immediate closure of the open globe must remain the priority in intraoperative management of SCH [10].

Immediate sclerotomy during the acute formation of massive suprachoroidal hemorrhage resulted in the further increase in suprachoroidal hemorrhage, with marked extension of hemorrhage into the retina and vitreous humor. Therefore, we think that immediate sclerotomy during massive suprachoroidal hemorrhage is detrimental to the eye. Our clinical data show that eyes with massive suprachoroidal hemorrhage can be treated successfully by secondary surgery, and the majority of the eyes can be salvaged with good visual results [10].

The role of sclerotomies at the time of acute event is controversial. Blood clots rapidly extend in the suprachoroidal space and so it may not drain through emergency sclerotomies [9].

In most cases, intraoperative drainage of suprachoroidal hemorrhage is not associated with better outcomes. The prognosis is more favorable if suprachoroidal hemorrhage is localized and does not extend in to the posterior pole [11].

If there is retinal detachment, incarceration of the vitreous or retina into the wound, secondary surgical management should be planned. Ideal time for vitrectomy is suggested to be 7–14 days after the SCH because that is the period when blood in suprachoroidal space liquefies [10]. Some authors underwent *pars plana* vitrectomy after an interval of 19 (14–54) days [12].

The natural course of the disease suggests that there is a very little change in the size of the choroidal detachment in the first 7 days. Maximum liquefaction of the suprachoroidal hemorrhage clot was seen to occur between 7 and 14 days. However, increased retinal and ciliary body atrophy was also noted 14 days. Therefore, the optimum time to drain massive suprachoroidal hemorrhage appears to be between 7 and 14 days. Immediate sclerotomy during the acute formation of massive suprachoroidal hemorrhage resulted in further increase in suprachoroidal hemorrhage, with marked extension of the hemorrhage into the retina and vitreous. Therefore, we consider immediate sclerotomy during massive suprachoroidal hemorrhage detrimental to the eye. Our clinical data show that eyes with massive suprachoroidal hemorrhage can be treated successfully by secondary surgery, and the majority of the eyes can be salvaged with good visual results [10].

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Postoperative B-scan ultrasonography can be used to monitor liquefaction of blood. In our case ultrasonography was not capable to give precise and detail status of blood in suprachoridal space due to the presence of silicon oil in the vitreal cavum.

It is recommended to drain blood through standard vitrectomy *pars plana* ports. If this is not possible drainage of hemorrhage should be done through posterior sclerotomies before *pars plana* ports are made in order to avoid iatrogenic damage to anterior retina unless the drainage can be accomplished through the standard ports for *pars plana* vitrectomy as it did in our case. We also used PFCL to facilitate drainage of SCH. To provide better attachment of the retina we performed tamponade with silicone oil. Tamponade with silicone oil was used for the presented patient because of uncertainty about the presence of unidentified retinal tears. Endolaser photocoagulation was done. Within one-month follow up, vision in the operated eye was 4/60.

## Conclusion

Although suprachoroidal hemorrhage is one of the most feared and devastating complications of intraocular surgery, it might have relatively good prognosis with proper preoperative, intraoperative and postoperative management. We reported this case as an example of successful management of suprachoroidal hemorrhage during *pars plana* vitrectomy of rhegmatogenous retinal detachment in spite of the fact that the eye looked lost.

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