TECHNIQUE

Active Aspiration of Suprachoroidal Hemorrhage Using a Guarded Needle

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BACKGROUND AND OBJECTIVE: To describe a novel technique using a guarded needle to drain suprachoroidal hemorrhage.

PATIENTS AND METHODS: A guarded needle is used to drain suprachoroidal hemorrhage under direct microscope visualization. A scleral buckling sleeve is used to create a guarded 26-gauge needle to avoid over-penetration of the needle beyond the suprachoroidal space. Active extrusion can be used to drain suprachoroidal blood.

RESULTS: The authors report two cases in which active aspiration using a guarded needle was successful in draining suprachoroidal hemorrhage without complications. In both cases, the vitreous cavity could be restored, allowing for subsequent pars plana vitrectomy.

CONCLUSION: The technique of active aspiration using a guarded needle optimizes surgeon control of suprachoroidal hemorrhage drainage and also has the added benefit of easy transition to secondary vitrectomy after drainage has been completed.

INTRODUCTION

Suprachoroidal hemorrhage (SCH) is a serious complication of intraocular surgery. There is a known risk of SCH associated with intraocular procedures including lens-related procedures, glaucoma surgery, retinal and vitreous procedures, and keratoplasty. Other risk factors include a history of glaucoma, increased axial length (greater than 25.8 mm), elevated preoperative IOP (greater than 18 mm Hg), generalized atherosclerosis, and intraoperative tachycardia.1

It is a generally accepted principle that drainage of SCH is best achieved after the clot has liquefied. Liquefaction of the hemorrhage typically occurs at approximately 10 to 14 days after the onset of the SCH. Alternatively, there are recent reports advocating the use of adjunctive suprachoroidal tissue plasminogen activator (tPA) to liquefy the clot to facilitate early drainage.2

Multiple surgical approaches to drain hemorrhagic choroidal detachments have been described. Conventional SCH drainage involves a conjunctival peritomy followed by isolation of the rectus muscles and scleral cut-down and posterior sclerotomy through which liquefied choroidal blood is drained. This technique involves significant conjunctival dissection, isolation of the rectus muscles, and a larger scleral opening. With sutureless microincisional pars plana vitrectomy trocar instruments, a more elegant technique would involve using a transconjunctival approach with placement of trocars in the suprachoroidal space to drain the hemorrhage.3 This technique avoids any conjunctival dissection because the posterior sclerotomy is left open for drainage by the trocar cannula.

All published techniques describe a passive drainage, which limits the surgeon’s ability to regulate the
rate of hemorrhage outflow. Passive drainage also relies on movement of the hemorrhage out of the sclerotomies without surgeon control and without direct visualization of the drainage.

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We describe a technique that allows for full surgeon control of drainage due to the active aspiration of the hemorrhage through a guarded needle. The closed system allows for more controlled drainage, which permits direct visualization of the drainage of the choroidal detachment utilizing a contact or non-contact wide-field viewing system. This technique optimizes surgeon control of SCH drainage and also sets the stage for easy transition to secondary vitrectomy after drainage has been completed.

A scleral buckling sleeve (element 270 or 70; Mira, Uxbridge, MA) is slid over the shaft of the 26-gauge, 3/8-inch needle. Surgical straight scissors are used to trim the redundancy of the 70-sleeve, to expose only 2 to 3 mm of the needle tip. This guarded needle will only allow the exposed 2- to 3-mm tip of the 26-gauge needle to enter the suprachoroidal space; the additional portion of the needle will be guarded by the sleeve to avoid over-penetration. Care must be taken in positioning the guarded needle from allowing the guard, or sleeve, from slipping off the needle. The development of a guarded needle has been previously described in subretinal fluid drainage for retinal detachment surgery including scleral buckling.4

It is important to ensure placement of an infusion line in preparation for choroidal drainage to provide ocular stability and avoid collapse of the globe during drainage. In most cases of SCH, placement of a posterior infusion is potentially problematic because there is little to no space in the vitreous cavity to place an infusion line. Placement of an anterior chamber maintainer at the inferotemporal limbus allows for adequate infusion in this situation. Alternatively, one could place a lighted infusion line 1 to 2 mm from the limbus in the area of lowest choroidal detachment (often inferior) if the patient is pseudophakic or aphakic. Following this, the guarded 26-gauge needle is attached to the extrusion line of the vitrectomy machine (Figure 1). Alternatively, an assistant can apply active aspiration via a 10-mL syringe connected to the 26-gauge guarded needle by surgical tubing. The guarded needle is then positioned 8 to 10 mm from the limbus temporal in the area of highest choroidal detachment (Figure 2). Often the area of the highest choroidal detachment is located temporally. This area also allows the greatest posterior access to the suprachoroidal space as well as theoretically providing the ability to drain the area of the choroidal detachment (temporal) that is most likely to affect the macula. Under
chandelier endoillumination, a non-contact wide-angle viewing system is moved into view, and the hemorrhagic choroidal detachment is directly visualized under the microscope. The guarded needle is then advanced into the suprachoroidal space with the bevel of the needle facing away from the inside of the eye to avoid incarceration as the choroidal detachment flattens.

Utilizing a medium level of aspiration with the vitrectomy machine, or slow controlled aspiration if done manually, the fluid or liquefied blood in the suprachoroidal space should be gently aspirated. The closed system of drainage allows the surgeon full control during aspiration (Figure 3, page 151, and Figure 4). This enables the surgeon to cease active aspiration at any point and refocus the viewing system, as well as completely controlling the IOP during drainage. The choroidal detachment will flatten in a controlled manner. In most cases, the entire detachment will evacuate through the needle placed temporally. As the choroidal detachment flattens, the surgeon should be able to directly visualize the macula and other retinal anatomical landmarks. The surgeon should withdraw the needle just prior to complete flattening of the detachment against the needle to avoid iatrogenic damage to the choroid, retinal pigment epithelium, or retina.

DISCUSSION: VIDEO CASES

Case 1

A 79-year-old woman presented after complicated phacoemulsification with loss of nuclear fragments in the vitreous cavity followed by suprachoroidal hemorrhage. The SCH was very large and was situated immediately posterior to the iris plane, making vitrectomy surgery to remove the lens fragments impossible. In this case, the SCH is drained by active aspiration using a guarded needle. This allowed for reformation of the vitreous cavity followed by vitrectomy and removal of dislocated lens fragments. The anterior chamber intraocular lens (IOL), with its haptic extending out of the corneal wound, is also removed. A posterior chamber IOL is later fixated in the ciliary sulcus to the sclera in a second-stage operation.

Case 2

The second case involved a patient who had undergone filtration surgery. Overfiltration led to hypotony, which resulted in the formation of appositional serous choroidal detachments that did not resolve with conservative management. In this case, it was possible to place an infusing chandelier light into the posterior segment inferiorly. The controlled aspiration provided by the vitrectomy machine (medium aspiration) allowed for 360˚ removal of choroidals in a controlled fashion.

Case 3

The third case involved a patient who developed a large temporal serous choroidal detachment after filtration surgery. Despite conservative management for several months and an IOP of 10 mm Hg, the detachment persisted. Despite good vision (20/40), the patient was bothered by a peripheral visual field defect from the detachment. She elected to undergo controlled drainage of the choroidal detachment with the external guarded needle technique. As the detachment was limited to the temporal region, infusion and illumination could be placed in the posterior segment. A slow, controlled drainage of her detachment allowed for a complete resolution (Figures 3 and 4). Surgical management of her overfiltration resulted in a complete resolution of her choroidal detachment and improvement of her peripheral field defect, with 20/25 final visual acuity (video available at www.Healio.com/OSLIRetina).

REFERENCES