A BRIEF GUIDE TO DRAINING CHOROIDAL HEMORRHAGES

Steps for success.

BY DAVID R.P. ALMEIDA, MD, MBA, PHD

I love to try new techniques and approaches, looking to solve surgical problems with insight, ingenuity, and intrepidness while being cognizant never to put patients at risk. The aim of this article is to discuss surgical techniques and share pearls for both common and complex vitreoretinal topics. Below, I answer a question posed by a reader of *Retina Today* with my own personal considerations and recommendations.

THE QUESTION

What's the best approach to drainage of choroidal hemorrhages and choroidal detachments?

THE SHORT ANSWER

This is a question I commonly hear from senior vitreoretinal fellows and retina specialists who have recently begun to practice. First, let me say that the best approach to any surgical technique is that which works best in your hands. Be open to trying new techniques, but focus on how to adapt any technique so that it best suits how you like to work.

Because drainage of a choroidal hemorrhage is not a procedure we perform routinely, surgeons may experience anxiety and be hesitant with their surgical approaches to this problem. Typical presentation of these devastating complications comes after cataract or glaucoma surgery (Video), when an episode of hypotony creates the antecedent environment ripe for choroidal hemorrhage.

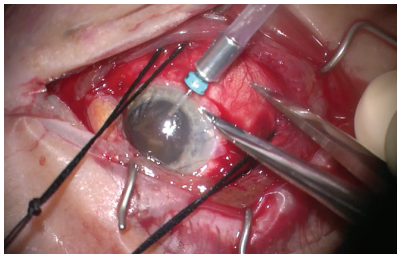
As with any surgery, planning and timing are crucial. For new choroidal hemorrhages, it is best to operate within 10 to 14 days. When possible, correct any anticoagulation issues as you plan for surgery. I find it helpful to follow these cases serially with echography to assess vitreous liquefaction, extension of the choroidal, and retinal involvement.

Surgery for choroidal hemorrhages or choroidal detachments with retinal adhesion (aka, kissing choroidals) or retinal detachment should be expedited. I usually look for a choroidal height of at least 5 mm on echography to permit successful surgical drainage.

THE LONG VERSION

Let's use the patient in the Video as an example. He has a large choroidal hemorrhage that eclipses 80% of the visual axis, as seen through the pupil, and is associated with retinal adhesion. Because access to the inferior and lateral rectus muscles is needed, a partial temporal peritomy is sufficient. In the Video, as I isolate the inferior rectus, notice how I slide the muscle hook backward and pull out the suture at the same time that I remove the muscle hook (Figure 1). As my residents and fellows know, I'm obsessed with eliminating surgical redundancy. I never use two steps when one will do. Economical surgical maneuvers will dramatically improve your efficiency in the OR.

WATCH IT NOW



BIT.LY/ALMEIDA1118

Once the inferior and lateral recti are isolated and the inferotemporal quadrant is exposed, I place a 25- or 27-gauge trocar in the corneal limbus to accommodate anterior infusion. Steady countertraction is essential for this step, which usually requires a significant amount of tangential force to securely place the trocar. I then turn on the anterior infusion to a pressure of 50 mm Hg to 60 mm Hg. A very high compensated IOP is needed to act as an active force, from anterior to posterior, to help drain the choroidal.

Next, I prepare for the actual drainage, for which I like using a nonvalved 23-gauge trocar. I also use calipers to measure 7 mm from the limbus in the most detached quadrant. This is best determined with preoperative or intraoperative echography. I like to work in the inferotemporal quadrant whenever possible because access is straightforward.

Perhaps you've heard the saying,

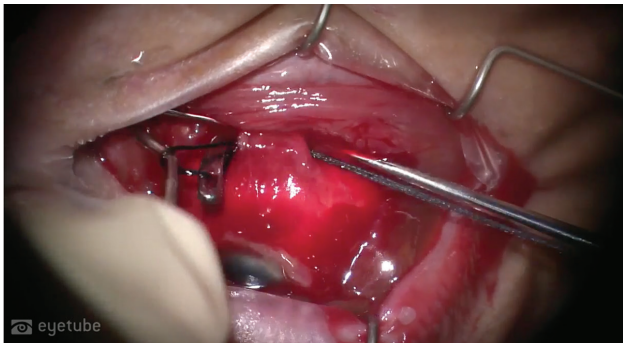


Figure 1. To eliminate surgical redundancy, the author pulls out the suture while removing the muscle hook, accomplishing two tasks in one step.

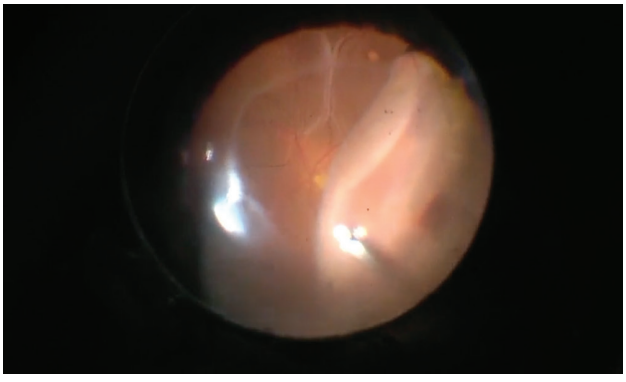


Figure 2. Limbal vitrectomy is performed in an aphakic eye to address posterior pathology such as retinal detachment or adhesion.

"Give me 6 hours to chop down a tree and I will spend the first 4 sharpening the axe," which has been attributed to Abraham Lincoln. Well, every surgery has a step or maneuver that embodies this sentiment, in which preparation determines performance. In this instance, it is the introduction of the drainage trocar for choroidal drainage. To do this, I clearly expose the quadrant to be drained, then measure, cauterize, measure again, and make sure I am happy with the visualization.

When ready, I introduce the nonvalved trocar very flat to the sclera, aiming for a 20˚ angle to the sclera. In the Video, my first attempt at this position is too shallow. I'm getting a lot of resistance, and my angle is approximately 13˚ to 15˚; consequently, I am running up against the scleral wall. Although I am able to drain some blood, this is not adequate for drainage, and the trocar slides out. If you are trying this technique for the first time, aim more shallow than deep so that you don't accidently puncture the retina with a large angle or trocar introduction.

Notice that my second pass has a slightly larger angle to the sclera, about 20˚, and this achieves secure placement into the choroidal space. Having the anterior infusion at 50 mm Hg to 60 mm Hg allows steady drainage of the hemorrhage. Notice the good placement and communication of the infusion. Looking at the pupil, you can see that more than 50% of the choroidal has been drained.

In aphakic eyes with retinal detachment or retinal adhesion, as in the Video, I like to perform a limbal vitrectomy to address any posterior pathology (Figure 2). You can see that the choroidal hemorrhage and detachment are dramatically smaller in size. I don't advocate complete drainage in these cases because, as we all know, perfect is the enemy of good! The remaining choroidal effusion will easily resolve on its own during the postoperative course. I suture the limbal wounds with 10-0 nylon, and I advocate leaving the drainage wound open. Do not suture this closed. Leaving it open will facilitate further drainage without any major risk of hypotony; however, a leaky limbus wound creates significant risk of postoperative hypotony.

TIDBITS TO TUCK AWAY

For drainage of a choroidal hemorrhage, avoid the 3-to-9-o'clock meridian in order to spare the ciliary nerve from iatrogenic surgical trauma. As I mentioned above, if possible, it is preferable to drain from the inferotemporal quadrant, as visualization and accessibility are best there, especially for right-handed surgeons.

In eyes in which vitrectomy is warranted, limbal vitrectomy works best for avoiding existing choroidals. When you perform this procedure, avoid air tamponade because the choroidals will often recur during this step, which will undoubtedly produce an unpleasant feeling in your stomach at the conclusion of an otherwise successful surgery. Moreover, air or gas tamponade can easily push subretinal fluid posteriorly, endangering the macula. For most cases, tamponade with balanced salt solution is adequate. When there is a concomitant retinal detachment with choroidal hemorrhage or detachment, I always use a noncompressible medium such as silicone oil.

WANT ANSWERS?

If you have a question that you would like addressed, please email me or contact me on Twitter. Likewise, if you have any feedback regarding this article, feel free to reach out. I would love to hear from you. ■

DAVID R.P. ALMEIDA, MD, MBA, PHD

- Vitreoretinal Surgeon, Metrolina Eye Associates, Charlotte, North Carolina
- dalmeida@metrolinaeye.com; Twitter: @davidalmeidaMD
- Financial disclosure: Consultant (Alcon, Allergan, Bayer, Genentech, Regeneron); Speaker (Alcon, Allergan, Bayer, Genentech, Regeneron); Advisory board (Alcon, Allergan, Bayer, Genentech, Regeneron); Cofounder, equity (Citrus Therapeutics); Investigator (Vitreq)