

Archiving Surgical Videos

Even reviewing your most routine cases can be of benefit.

BY STEVEN H. DEWEY, MD

Whether you are trying to incorporate a new technique into your surgical repertoire or improve your current operation, videotaping your surgical sessions allows you to objectively review procedures long after their emotional immediacy fades. Attaching even the most basic camera to an old VHS unit quickly demonstrates which aspects of your technique are effective and which are painful to watch.

Did you create the appropriate capsulorhexis for the removal of the nucleus and the IOL's placement? Was the sideport incision properly located relative to the primary incision? These details can significantly affect the consistency of your surgery.

CONSTANT SURVEILLANCE

I recommend recording every procedure you perform in the OR. When preparing to perform a new technique, we surgeons usually read articles, attend didactic courses, and watch videotapes before conceptualizing how we will execute the procedure. When we finally try the technique, however, does it work exactly as we expected? That is where video recording comes into play.

Nothing hides from video documentation. The intricacy of a "routine" cataract surgery is remarkable. Adding a Malyugin ring (MicroSurgical Technology, Redmond, WA) or a modified Cionni Capsular Tension Ring (Morcher GmbH, Stuttgart, Germany; distributed in the US by FCI Ophthalmics, Inc., Marshfield Hills, MA), however, substantially increases the procedure's complexity. I have a hard enough time remembering my children's names, let alone what each of my hands was doing during surgery.

Videotapes do not lie. They document our great successes or reveal our blunders. In the past, I selectively recorded my sessions in the OR only to find that I never seemed to capture my best moments. For example, one day, I incidentally grabbed the capsule with a rounded phaco needle without completely destroying the structure. Unfortunately, the circulating nurse told me it was the only case of the day we forgot to record. Hence, when we call for lights off in the

OR at the start of a case, my staff and I jokingly say, "Lights, camera, videotape" to initiate the recording process.

THE UTILITY OF A LOG

We surgeons forget a bad surgical experience before moving on to our next case. Unfortunately, this otherwise useful trait makes it difficult for us to locate video footage of an interesting case we performed a couple of months ago. I overcome this problem by maintaining a written log of every surgery I tape. The more data you record in the log, the easier it is to find the video you are seeking later. My log includes information about the patient's demographics, the parameters of the phaco procedure, the type and power of the implant, and the starting time or counter reading from the recording device. I also include a short note (eg, nice chop or small pupil) to help me distinguish among cases. Comments such as *The vile nucleus descended to the demonic depths of the vitreous and was unresponsive to my efforts to bring it forth* might be more descriptive, but they can impede the turnover between cases.

STARTING POINT

A microscope-mounted camera can be an expensive investment for any ophthalmic practice. Although a single-chip camera may seem more affordable, a three-chip camera will produce higher-quality images and will be a better choice in the long run. You can even purchase a true high-definition camera now. Do not skimp on the adapter that connects the camera to the microscope, either. Overlooking this item can cause a very expensive camera to produce cheap-looking videos.

Although an old VHS system will adequately record ophthalmic surgery, the results will look particularly dated in today's high-definition world. Moving to digital recording, either through your family's digital video camera or a dedicated digital device, will immensely improve the quality of the images you capture. Digital video recording additionally simplifies the editing process, and it will preserve the quality of the image through several generations of copying.

ADDITIONAL INFORMATION

Overlaying a video with technical information about phaco settings can help you identify the cause of unsuccessful procedures or intraoperative events. The phaco platforms produced by Alcon Laboratories, Inc. (Fort Worth, TX), Advanced Medical Optics, Inc. (Santa Ana, CA), and Bausch & Lomb (Rochester, NY) allow you to overlay information about vacuum, aspiration, the foot pedal's position, the bottle's height, and other parameters directly onto the images captured by the camera. This information is permanently embedded in a fixed position on the captured video.

The major phaco platforms also record your preset parameters, which can help you identify significant differences between their intended settings and the actual intraoperative values. For example, if you preset vacuum at 650 mm Hg, you may discover while reviewing the video that you consistently achieve only 350 to 400 mm Hg of vacuum.

A screen capture of these overlays provides a snapshot of a brief intraoperative moment. This information is relatively static, however, much like photographs of the road taken through a car's windshield to include the dashboard's displays. Although the data are valuable, they do not indicate trends, such as whether vacuum was increasing or decreasing or whether the aspiration had leveled off with occlusion at the captured moment.

ADVANCED VIDEO CAPTURE

The Surgical Media Center (SMC) software from Advanced Medical Optics, Inc., is at the leading edge of digital recording technology. It captures video from the microscope camera's S-video output and sends the images to a laptop computer's hard drive. The SMC simultaneously transfers a data file containing all of the surgery's parameters from the Whitestar Signature System (Advanced Medical Optics, Inc.) to the laptop housing the SMC. Because the video files are digital, they can be reviewed immediately, and I have found them to be exceptionally easy to store on a hard drive.

The 250-gb hard drive I brought to the 2008 ASCRS meeting in Chicago contained videos of every case I had recorded with the SMC between October 2007 and April 2008—and still had room for 3 months' worth of additional recordings. To store the same amount of information on a conventional mini-DV tape would have taken an extraordinary effort, and it would have been impossible with VHS tapes. More importantly, easy access to my videos lets me create presentations anywhere using only my laptop, and it allows me to make substantial changes in my presentations without starting from zero. Because the files are so portable, and hard drives are relatively inexpensive, I never delete older videos to make room for new ones, as I would with tape-based storage systems.



Figure 1. The SMC software allows you to move the status graphs to different areas of the video so they do not obscure the view of where the primary action is occurring.

For me, the SMC is a valuable teaching tool, because it creates real-time graphic displays of the phaco system's parameters that correspond with events shown on the captured video. Whereas older overlays show a snapshot of a system's status at one point in time, the SMC shows the changes in power, vacuum, and aspiration that occur before, during, and after a particular point in the video (Figure 1). The ability to fully evaluate a particular intraoperative moment allows me to refine my techniques and reduce complications.

PARTING WORDS

Whether you plan to share surgical videos with your peers on Eyetube.net or with your child's fourth grade class, keeping a record of your experiences affords tremendous personal and professional benefits. Although the technology involved in creating and archiving surgical videos may seem daunting at first, the process is rapidly becoming much simpler as the quality of video equipment becomes more sophisticated. ■

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