

Creating Quality Surgical Videos

BY JOHN KITCHENS, MD

Creating quality surgical videos involves more than just recording an interesting surgical case and uploading it to Eyetube.net, submitting it to the American Society of Retina Specialists (ASRS), or publishing it in a journal such as the *British Journal of Ophthalmology*. It is a process that involves the capturing of the highest quality of video and extends to adding quality finishing touches such as adding narration. In this article, I review the process that I use to create a surgical video. Along the way, I provide tips and techniques that can make the process easier.

CAPTURING THE VIDEO

First, in order to make a surgical video, you need the equipment to record the case. This step may make it difficult for many vitreoretinal surgeons to produce great surgical videos. Although most surgical microscopes have the capacity for cameras to be attached to them, older microscopes may require that the assistant scope be used for the camera system. This can be a major issue for surgeons who depend on their OR nurse to assist during surgery.

Newer scopes, such as those made by Leica Microsystems (Wetzlar, Germany) and Carl Zeiss Meditec (Jena, Germany), have the ability to preserve the assistant scope while adding the camera. In addition, many of these newer scopes can be purchased with digital video recording and storage devices. Digital video recording eliminates the step of transferring the video from a VHS tape (or other medium). The hospital at which our group operates, Saint Joseph's East in Lexington, KY, made the investment in digital video recording equipment 3 years ago when it purchased a Leica scope (Figure 1). This equipment not only helps us record great surgical video, but it also helps the nurses, anesthesia, and ancillary staff know what is occurring during the case, thanks to large video monitor mounted to the wall.

As with any video recording equipment, to get the best results one must have a basic understanding of



Figure 1. Leica microscope connected to the digital video recording camera.

the mechanics of the scope and camera (zoom, focus, etc). A tutorial from the sales representative regarding white balance and recording options definitely helps as well. Ideally, a surgical assistant can have a working understanding of the video equipment and help keep the recording in focus and centered.

TRANSFER THE VIDEO

After recording a surgical case or cases, the next step is to transfer the video to your computer. If you have an older camera that records to a VHS tape, then



Figure 2. Windows-based Leica system.

there will be the extra step needed to duplicate the VHS tape into a digital file. If you have a digital recording system, then you need to transfer the video files from the recording device to your computer. Initially, I used DVDs and would burn a DVD for each OR day. This process is time consuming and a bit wasteful. Currently, I use large (32GB) USB thumb drives to transfer the data. Each video is stored in the Windows-

based Leica system as a Windows Media Video (.wmv; Microsoft, Redmond, WA) file (Figure 2). A 30-minute case will occupy approximately 700 MB of space.

Because of the size of the high quality surgical video, it is important to use a USB drive with high data transfer rates. The Flash Voyager (Corsair, Fremont, CA; \$90 on Amazon) and the DataTraveler (Kingston Technology, Fountain Valley, CA; approximately \$80) are both good drivers that take 3 to 5 minutes to transfer a case.

CONVERT THE VIDEO

As an avid Apple (Cupertino, CA) user, a Windows Media File can create havoc with many of the Apple applications for video editing. In the past, I used conversion software such as Flip4Mac WNV (Telestream, Nevada City, CA; \$29 to \$179 at www.telestream.net). This software converts these files and helps to incorporate them into iMovie (Apple) or Final Cut (Apple). The conversion process is slow and processor-intensive. Preferring to multitask, I now use Xilisoft (Toronto, CA) Video converter (\$39.95 to \$59.95 at www.xilisoft.com) to convert multiple video files into either Quicktime (.mov) or MPEG-4 (.mp4) files. I usually do this on a separate machine or at a separate time.

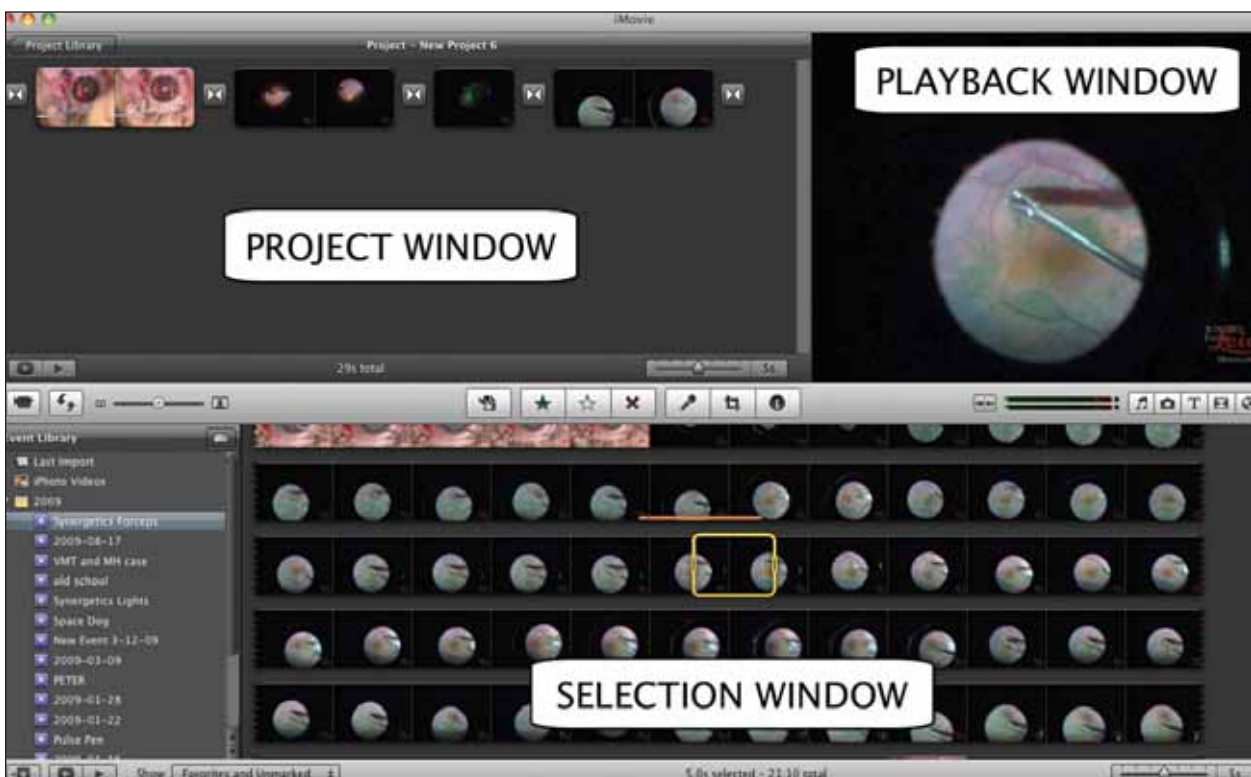


Figure 3. iMovie project windows.

KEYS TO MAKING ENTERTAINING SURGICAL VIDEOS

- 1. Case selection:** Don't show your routine cases. Instead focus on something challenging or novel. Your technique (such as ILM peeling) can be interesting if done in a different or novel way, but films like this should be kept short and to the point.
- 2. Keep it short:** The most interesting cases can be shown in 3-5 minutes. That is about the attention span of most internet video viewers (and vitreoretinal surgeons are not much different than your average 18 year-old surfer). Keep it to the point, and use your time to emphasize the interesting points of the case.
- 3. Crop it:** iMovie has a nice tool for cropping video. This eliminates the black space around the scope view. Technical details of the surgical video can be lost if the video captured is too small. Try to eliminate black space surrounding the image at the time of surgery by using the zoom on the camera. If there is extra black space surrounding the surgical scope view, then use the cropping function found in iMovie or most other video editing software.
- 4. Add narration and/or music:** Most good surgical videos will speak for themselves. It is good to have narration, however, to help the viewer understand the techniques you wish to emphasize.
- 5. Tell the story:** It is always a good idea to show small clips of the entire case. It is also important to show preoperative images that may be pertinent to the case, such as angiograms, photos, or OCTs. Postoperative images can complete a quality surgical video and emphasize that the technique was effective.

EDIT THE VIDEO

There are two keys to good video editing. First, select the best software editing program. Prior to the newest version of iMovie, I used Final Cut (Express \$199/Studio \$999 at store.apple.com). For most of us,

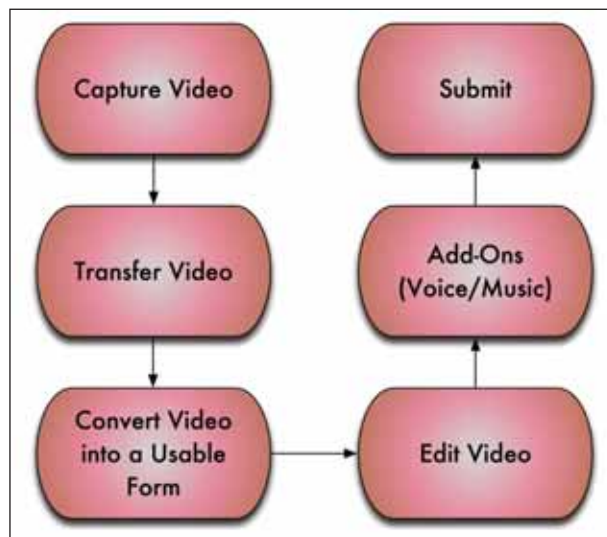


Figure 4. Steps in the process of making a surgical video.

the Express version is more than sufficient. Both of these applications are extremely powerful and tend to be useful for larger projects. In addition, they are not very intuitive and have a fairly high learning curve.

Fortunately, in the past year Apple made iMovie '09, part of the iLife (Apple) application suite (\$79 for a single user version at store.apple.com), much easier to use. It has excellent transitions and titles that can give your video a refined look. In addition, it has more advanced features such as picture-in-picture, pause, and zoom. In my opinion, it is the perfect application for creating a quality 3- to 5-minute video; it is as easy as any that I have used to perform basic video editing. Some of the more advanced features have a learning curve, but almost anyone can begin making clear and concise videos within approximately 1 hour. There is little, if any, drop-off in video quality when compared with Final Cut (Figure 3).

Steps involved in creating the video involve copying the video files into the iMovie application. You then must create a "Project." Unless your video capture system has a widescreen camera (16:9 aspect ratio), you will want to select the Standard aspect ratio (4:3). I prefer to specify that all the transitions will be "cross dissolves." Cross-dissolves make the different clips seamlessly fade into one another, making the video look more professional and giving the impression of a time lapse between different portions of the case. Once video clips have been selected, you can begin selecting various portions of the case you want to emphasize. In the lower portion of the application, your unedited video will be exhibited like a film strip.

EYETUBE (WWW.EYETUBE.NET)

Eyetube's goal is to "better educate ophthalmologists through the online archiving and sharing of videos." The Eyetube site offers a variety of video content that includes symposia videos, video collections, and various seminars and lectures that have been recorded. It has video content covering all topics from oculoplastics through retina. Vitreoretinal surgery makes up the second largest collection of videos on Eyetube (behind cataract surgery videos). In addition to user-generated content, it also provides courses such as Retinaw and Advanced Vitreoretinal Techniques and Technology (from the World Ophthalmology Congress). The site also has video competitions where users can vote on their favorite videos. For aspiring contributors, Eyetube staff will actually edit your surgical video for you. After they have edited the video, you are sent a digital dictaphone to provide an appropriate voiceover for your film. It really is a great service for vitreoretinal surgeons who may not have the time in their busy schedules to submit fully edited videos.

You can select the portion of the case you want in your final video with the mouse and drag it to the top panel project area (or, simply hit the shortcut "E" key) that shows which clips of your unedited video you want to include in your final edited video. You then select the next portion of the video and repeat. You can trim clips (shorten or lengthen the individual segments) either before or after you have added them to the project area. If you have specified that the transi-

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tions are to be automatically added (see above), then the specified transitions will automatically be placed between each clip. If you have not, then you will need to add transitions manually. To do this, you click "select the transitions" button. Select your transition and drag and drop it between the two clips above. You can add titles in a similar manner by using the title slide button (select the title style, drag and drop on the clip that you want the title to appear in).

Once you have completed your video, it then must be exported into the most appropriate video resolution and file type.

ADD-ONS

At this stage, I like to add my voiceover and any music to the video. Another member of the iLife suite of applications that is useful for this is GarageBand (Apple). After exporting the video in Quicktime (Apple) format, I import it into this application to add my voiceover and any background music. GarageBand is a little tricky with a slightly higher learning curve than iMovie. For a more complete tutorial on using GarageBand, please see my online tutorial at <http://eyetube.net/v.asp?miwiwi>. Although a quality voiceover and music are not essential for an entertaining and educational video, they certainly can help express what is going on during the case as well as making the video much more entertaining.

SUBMISSION

Knowing where to submit your video prior to beginning the process can help in many ways. First, it allows you to target your video toward the intended audience. Second, knowing the format the video must be in for proper submission is essential. There are a variety of forums to present your surgical video. The more academic route would involve submitting to a journal such as the *British Journal of Ophthalmology*, *Archives of Ophthalmology*, *Retina*, or other major peer-reviewed journals that support video submissions. Videos often require an abstract and undergo a review process similar to other journal submissions. Accepted videos will be referenced in PubMed if the journal is indexed by the US National Library of Medicine.

A multitude of Web sites are available for uploading

WATCH IT ON NOW ON THE RETINA SURGERY CHANNEL AT WWW.EYETUBE.NET!**Editing Surgical Videos with iMovie**

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VIT-BUCKLE SOCIETY

direct link to video:

<http://eyetube.net/v.asp?miwiwi>



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surgical videos. Eyetube (eyetube.net) is a site lauded for its surgical videos. Fully edited videos with narration and music can be uploaded to the site, or the submitter has the option to upload unedited surgical videos. At no cost, the editorial/technical staff will edit them and send an mp3 recorder, allowing you to add narration to the finished product (see inset on page 36).

Of course, sites such as YouTube or Facebook are options for surgical videos. These forums, however, are not specifically geared toward the medical field or ophthalmology as is Eyetube. Additionally, technical assistance is not available.

In conclusion, submission of a video involves numerous steps (Figure 4). Each of these may be done with minimal effort utilizing the correct software and format. The finished product may be a beneficial tool for vitreoretinal surgeons to discuss in an open forum and may allow valuable surgical pearls to be disseminated worldwide. ■

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