

Educational Video Recording and Editing for the Hand Surgeon

Shady A. Rehim, MB, Kevin C. Chung, MD

Digital video recordings are increasingly used across various medical and surgical disciplines including hand surgery for documentation of patient care, resident education, scientific presentations, and publications. In recent years, the introduction of sophisticated computer hardware and software technology has simplified the process of digital video production and improved means of disseminating large digital data files. However, the creation of high-quality surgical video footage requires a basic understanding of key technical considerations, together with creativity and sound aesthetic judgment of the videographer. In this article we outline the practical steps involved in equipment preparation, video recording, editing, and archiving, as well as guidance for the choice of suitable hardware and software equipment. (*J Hand Surg Am.* 2015;40(5):1048–1054. Copyright © 2015 by the American Society for Surgery of the Hand. All rights reserved.)

Key words Equipment, video editing, video recording/instrumentation, software.



VIDEO RECORDINGS ARE ESSENTIAL for scientific presentations, research, and patient education.^{1–3} Video illustrations also facilitate effective physician-to-physician communication, enhance teaching, and maximize an audience's attention and retention. In hand surgery, capturing dynamic images has added advantages over standard still photography. Video footage can help to identify changes in patients' range of motion before and after surgery and facilitate

documentation of patients' examination over time. For the hand surgeon, video recording and editing offer a good opportunity (especially for the junior surgeon) to review critical steps of the surgical procedure and reflect on what could be improved the next time.⁴

Over the past decades, recording a surgical video was considered to be a difficult task that often required hiring professional personnel and the use of large and heavy equipment. In addition, captured videos were stored on analog VHS tapes before they were converted to digital files and then transferred to computers, thus creating numerous quality and compatibility issues. Currently, these equipment and technical issues have become less of a concern. The availability of smart pocket-sized camcorders allows surgeons to capture their own videos and provides an economic and more practical alternative to using archaic expensive and large equipment. Furthermore, digital files can now be easily transferred directly from the camera to the computer for further video processing using small memory cards with high storage capacity.

The purpose of this article was to provide a step-by-step approach to creating professional surgical videos recorded in the clinic and the operating room

From the Section of Plastic Surgery, Department of Surgery, University of Michigan Health System; and the Section of Plastic Surgery, University of Michigan Medical School, Ann Arbor, MI.

Received for publication April 2, 2014; accepted in revised form August 7, 2014.

This publication was supported in part by the National Institute of Arthritis and Musculoskeletal and Skin Diseases and National Institute on Aging (R01 AR062066) and the National Institute of Arthritis and Musculoskeletal and Skin Diseases (2R01 AR047328-06). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

Corresponding author: Kevin C. Chung, MD, Section of Plastic Surgery, University of Michigan Health System, 2130 Taubman Center, SPC 5340, 1500 E. Medical Center Drive, Ann Arbor, MI, 48109-5340; e-mail: kechung@umich.edu.

0363-5023/15/4005-0035\$36.00/0
<http://dx.doi.org/10.1016/j.jhsa.2014.08.021>

(OR) that can be effectively integrated into the hand surgeon's daily practice.

Creating a surgical video involves 4 sequential and reproducible steps, including equipment preparation, video recording, video editing, and finally video archiving and distribution for publication and/or presentation of the recorded material.

EQUIPMENT PREPARATION

Before video capture takes place, the hand surgeon must first acquire the equipment necessary to record and then edit the procedure of interest (Table 1). The camera used for video recording is one of the most important pieces of equipment for this process. Several types of cameras are suitable for recording surgical videos; these include operating room light handles with built-in cameras, remote-controlled cameras mounted on metal tripods, and new-generation wearable devices such as head-mounted cameras, among others.^{1,3–6} In our institution, we prefer to use a high-definition handheld camcorder without a special lens or accessories because they are easy to operate and provide a quick and consistent method of video recording in both the clinic and OR settings.⁶ We use a point-and-shoot camcorder Sony Handycam HDR-CX160 (Sony, Minato, Tokyo, Japan) with a swivel liquid crystal display side flat screen attached to the camera with a flexible hinge that allows the operator to move the camera in different directions and shoot from a wide range of angles (Fig. 1). Camcorders are relatively inexpensive; the average price of a modern handheld video camera ranges between \$300 and \$700. However, the disadvantage of handheld cameras is the need for a dedicated person to operate the camera steadily without tremor.

Although most camcorders are calibrated (ie, default settings) to capture the highest-quality images automatically, it is important for the operator to have a basic understanding of the camera manual of operations as well as its features and associated lens equipment. A video camera has 3 main elements: the lens, an imaging device (sensor), and a recorder. The lens gathers and transmits light reflected off an object and focuses it on the imaging device. Subsequently, the imaging device transforms light waves into electrical signals, which are then converted into video pictures by the recorder.⁷ The auto-iris of the lens or diaphragm known as the aperture controls the amount of light transmitted (exposure) through the lens and the depth of field (DOF). The aperture of the lens opens and closes to adjust the light exposure of the

TABLE 1. Necessary Equipment for Production of Surgical Videos

1. Camera (eg, handheld camcorder)
2. Desktop or notebook computer
3. Video editing software
4. Storage devices (eg, flash drive, external hard drive > 1 TB)
5. External/built-in microphone
6. Connectors, adaptors, cables, and a spare fully charged battery

image so that it is neither too dark nor too bright. The DOF is the area between the closest and the farthest objects in an image that appears in focus. Areas in front and beyond the DOF will appear blurry. A large DOF (also known as deep focus) increases the sharpness of the entire image, whereas a small DOF (shallow focus) keeps a small plane of the image in focus while the rest of the image is out of focus. At a given magnification, decreasing the aperture increases the DOF, and vice versa. For medical video recordings, it is therefore recommended to use a small aperture and a large DOF to keep the whole image in focus and capture important anatomical details.^{7,8}

VIDEO RECORDING

After equipment needed to record a surgical video is assembled, informed consent should be obtained to seek patients' permission to use the recorded material for purposes of academic publications, to comply with Health Insurance Portability and Accountability Act regulations. The patient's face must not be shown while recording a hand procedure and other patient identifiers such as name, address, or hospital number must not be identified.^{8,9}

Recording a good video depends not only on camera specifications but also on the skills of the videographer in selecting the correct position, angle, and distance that should clearly demonstrate the procedure of interest. Poorly recorded video footage can be detrimental to the final product and often cannot be salvaged later. The first step in recording involves correct and consistent positioning of the camera operator directly behind the surgeon to record videos from the surgeon's view (Fig. 1).^{8,10,11} Frequent change of view from the surgeon and the assistant's perspectives is disruptive to viewers in understanding the anatomic features of the operation. During recording, the surgical field should be cleared of equipment not in use (eg, retractors, scissors, metal forceps, cotton gauze) and surgeons and assistants

Download English Version:

<https://daneshyari.com/en/article/4066832>

Download Persian Version:

<https://daneshyari.com/article/4066832>

[Daneshyari.com](https://daneshyari.com)