

Novel Method for Obtaining Intraoperative Digital Video

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Acquiring intraoperative digital video (DV) remains a challenge for the plastic surgeon, as recording DV generally relies on ancillary or nursing staff to frame the content and focus in

on the relevant sector(s) of the surgical field. Obtaining DV outside of the surgical field often leads to motion artifacts, off-axis framing, or nonideal target selection. This also results



Fig. 1 Intraoperative images using smartphone and plastic bag. (A) Lateral view after open rhinoplasty procedure. (B) Cartilage graft harvest. (C) Frontal view with visualization of key structures.

in unnecessary pauses during the procedure and requires surgeons to interrupt the flow of the operative case. Alternatively, if a surgeon acquires his/her own video by wearing sterile outer gloves or breaking scrub, delays occur and hospital time and resources are wasted.

Migration to digital media for updated information has resulted in a dramatic rise in the use of smartphone technology over the past 10 years, and their use in plastic surgery has increased as well. Access to surgical videos online provides surgeons in practice and in training with the opportunity to readily observe surgical procedures, learn new techniques, and explore relevant anatomy.

A variety of methods have been proposed for obtaining high-quality intraoperative DV, including suspension of cameras to overhead lighting, attachment to headlights, and enclosure with nylon bags or sterilized underwater camera cases. Smartphones have also allowed DV to be obtained with smartphone holders anchored to operating room overhead lighting or through the use of modified camera covers. While these methods provide real-time surgeon-directed imaging, overhead equipment is expensive and setup is not always feasible in the operating room, as camera covers risk contamination by leaving the lens and flash uncovered.

At our institution, we have found a simple and cost-effective method for obtaining intraoperative DV. At the beginning of the case, we place our smartphones in a 20 × 25 cm sterile operative plastic bag (Catalog #32-1178, DeRoyal, Powell, TN) and use the camera natively during surgery to obtain DV and digital images without operative interruption or disruption of the sterile field.

This method requires no modification of the bag with tape/draping and no operating room setup, and maintains sterility of the surgical field throughout the procedure. The images obtained are free from geometric distortion from the plastic (► **Fig. 1A-C**), and the surgeon is able to use his own phone without use of additional photography equipment, stands, or perioperative staff assistance. We have found that the best quality is achieved when the distance between the camera phone objective and plastic bag is minimized to reduce diffraction effects; however, this does not require specialized expertise.

The compact nature of smartphones offers the surgeon the ease of capturing detailed video of surgical maneuvers (► **Video 1**), whereas the widespread use of these devices ensures availability in any operative case. Other than the surgeon's phone and the bag, this method requires no additional special equipment, preserves the sterile field, and does not require additional sterilization.

Video 1

Intraoperative video of rhinoplasty instruction, which demonstrates excellent video quality obtained during the procedure by the primary or assistant surgeon. Online content including video sequences viewable at: <https://www.thieme-connect.com/products/ejournals/html/doi/10.1055/s-0036-1597686>.