

## A “flexible tripod” mounted video camera: An economical and effective method to record oculoplastic surgeries

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Recording surgical procedures is of value for teaching and training in residency and fellowship programs. Operating external ophthalmic surgeries is not as easy as recording intraocular surgeries. In this communication, we describe the use of a video recorder mounted on a flexible tripod (Gorillapod<sup>®</sup>), a commonly available photography accessory; which is fixed to an IV fluid stand. This set up was used to record external ophthalmic surgeries and the recorded videos were of high quality in terms of stability and required no change in surgical technique to ensure that the area of interest was in focus. In our experience, early results show that a flexible tripod offers an economical mount for recording external surgeries with reproducible results.

**Key words:** GoPro, Gorillapod, oculoplastic surgery, ophthalmology training, surgical recording, tripod, video recording

Surgical videos have a profound effect on the surgeon-in-training – in comprehending the surgical anatomy and the technique. Compared to still images of the same surgery, a video recording offers greater insight and understanding. In addition, narration during the surgical video enhances the value of videos significantly by allowing the viewer to understand the surgeon’s thought process.<sup>[1]</sup> In ophthalmology, intraocular surgery – like cataract or vitreoretinal surgery; is easy to record because, in most cases, the required hardware is built in to the operating microscope viewing system.<sup>[2]</sup> In contrast, external ophthalmic surgeries – namely oculoplastic surgery are difficult to record through a microscope since most surgeons do not commonly use the microscope for operating. More often than not, an additional cameraperson using a hand-held video camera (camcorder) is required to record external ophthalmic procedures. In this communication, we present a cost-effective technique of mounting a video camera in the operating room to record oculoplastic surgeries in an unobtrusive way and without the need for an additional personnel to manage the camera. Here, we use an IV fluid stand, a camcorder with a screen and a flexible tripod. We used a “Gorillapod<sup>®</sup>” (JOBY Inc. Petaluma, CA) for our surgeries.

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## Technique

A flexible tripod has bendable legs that are designed to bend and wrap [Fig. 1]. A traditional rigid tripod only allows the user to set up on even, smooth surfaces. In contrast, flexible tripods like the Gorillapod<sup>®</sup> are designed to be used in areas and surfaces that are unsuitable for a traditional tripod. Furthermore, the bending action of the legs allows it to be wrapped around poles and rods. The flexible legs can be twisted and turned till the tripod is firmly fixed with a tight fit. In our operating room, a Gorillapod<sup>®</sup> was wrapped around the IV fluid stand at the top – over the horizontal bar with hooks for hanging IV fluid bags [Fig. 2a]. Atop the Gorillapod<sup>®</sup> is a standard ¼” universal screw which allows for fixing all DSLR cameras, point-and-shoot cameras and video recorders. The screw is fixed on top of a ball that allows for 360-degree rotation. Therefore, after fixing the camera, it can be rotated to focus on the area of interest [Fig. 2b]. The surgeon can periodically check on the camera display screen during the surgery to ensure that the desired surgical field is being recorded [Fig. 2c]. The flexible tripod used by us – the Gorillapod<sup>®</sup> can easily hold cameras weighing up to 4 kg. The IV fluid stand is typically kept at the head-end of the patient on the side opposite to the eye being operated – such that it remains unobtrusive. In our experience, we used a Canon Vixia RF700 (Canon, Ota, Tokyo,

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**Figure 1:** A picture of the Gorillapod® with flexible legs

Japan); weighing 235 g, which could record Full HD resolution video capture. Screenshots of surgical videos recorded using the above technique demonstrate the anatomy very clearly with adequate illumination from overhead lights and in some cases, illumination using the light from the operating microscope. We have recorded over 50 surgeries of varying durations in the past 2 years using the same flexible tripod – the longest surgery being 3 hours long. We did not see any image shake in any of our surgical videos [Fig. 3]. ([www.tiny.cc/ptosis](http://www.tiny.cc/ptosis), [www.tiny.cc/entropion](http://www.tiny.cc/entropion), [www.tiny.cc/evisceration](http://www.tiny.cc/evisceration)).

**Discussion**

There have been many techniques reported in literature where authors have used new cameras and accessories to record external oculoplastic/facial surgery. Cameras mounted on the overhead lights are used regularly – most ophthalmic operating rooms, though may not have overhead lights, let alone, camera-mounted lights. Nair *et al.*<sup>[2]</sup> reported the use of a sports camera – a GoPro which was affixed to the surgeon’s head. The prohibitive cost, short recording time and the large sized files are drawbacks of this set-up. Kimyon *et al.* used a selfie stick mounted on the ceiling-fixed overhead lights. A smartphone, fixed on the selfie-stick was used to record the surgeries.<sup>[3]</sup> A universal phone tripod clamp adapter can be



**Figure 2:** A camcorder fixed on the Gorillapod® with its legs wrapped around the IV stand at the top – over the horizontal bar with hooks for hanging IV fluid bags (a). The IV fluid stand is at the head-end of the patient on the side opposite to the eye being operated. The position, angulation and the focal length of the camera is adjusted such that the area of interest is captured (b and c)



**Figure 3:** Screenshots from videos recorded using the described set up: evisceration (a), entropion correction (b), and ptosis surgery – levator resection surgery (c)

used to fix a smartphone to the flexible tripod. The quality of the videos recorded on a smartphone are not comparable to the video quality of footage recorded using a camcorder owing to the limitations of the lens and camera of the smartphone.

Rehim *et al.*<sup>[4]</sup> have comprehensively discussed the use of a camcorder and also the practical steps involved in equipment preparation, video recording, editing, and archiving as well as guidance in the choice of suitable hardware and software equipment. But an additional videographer is required in their technique of recording hand surgeries and has a considerable learning curve.

Murala *et al.*<sup>[5]</sup> have described the use of a “surgical eye”: a small camera mounted between the standard surgical loupe lenses. As is the case with the surgeon’s point-of-view technique described by Nair *et al.*; the footage obtained using the loupe-fixed camera will not have a constant field of view owing to the head movements of the surgeon. Other wearable devices like Google Glass have also been used in the operating room. But while using Google Glass, the surgeon cannot comfortably wear loupes while operating, and the technology does not allow long periods of hands-free video recording.<sup>[6]</sup>

To the best of our knowledge, the use of a flexible tripod in the operating room has not been described in literature. Commonly available at an average cost of INR 2500 to INR 3800 (USD 35–50), the use of a Gorillapod®, or any other flexible tripod mounted video-recorder is an economically viable option that can be utilized to record reproducible, high quality

surgical videos of oculoplastic and strabismus surgeries in the ophthalmic operating room.

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#### Conflicts of interest

There are no conflicts of interest.

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