The Whole Glove Tourniquet Technique Revisited With Video Instruction

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Summary: This article revisits the whole glove tourniquet technique with video instruction. The whole glove tourniquet is a digital device that can be used to improve patient safety during hand surgery procedures performed under local anesthesia. Major benefits include of using this device are lower risk of the tourniquet being inadvertently left on the finger after completion of the procedure and improved sterile field in patients with heavily soiled extremities. The procedure is simple to use and does not require any specialized equipment, making it ideal for a wide variety of economic environments. (Plast Reconstr Surg Glob Open 2020;8:e2811; doi: 10.1097/GOX.0000000000002811; Published online 18 May 2020.)

INTRODUCTION

When conducting minor surgical procedures on fingers, it is often desirable to have a bloodless field. Certainly, many such cases do not require the use of a forearm or upper arm tourniquet and, indeed, this would be poorly tolerated for procedures requiring longer than 15–20 minutes because digital procedures are typically done using a Wide Awake Local Anesthetic No Tourniquet approach.1–4 Although no tourniquet proximal to the digit itself is required in Wide Awake Local Anesthetic No Tourniquet, it is often the case that a digital tourniquet is used. Through the years, various options have been proposed for a digital tourniquet, including a Penrose drain,5 a single-digit cut from a surgical glove,6–10 or commercially available devices.11

The inadvertent failure to remove a digital tourniquet has been reported when using these single-digit tourniquet techniques.7–10 Complications with single-digit tourniquets range from temporary venous congestion to irreversible digital necrosis.7–10 Commercially available devices typically incorporate certain features to diminish the likelihood that they would be inadvertently left on the patient at the end of the procedure and cause digital ischemia,11 including making them large and bulky, an eye-catching color, or having a large tag to alert the user to their presence. Another previously described strategy to avoid accidental ischemia includes leaving a lengthy proximal extension of a rolled glove attached to the finger of the glove being used for the tourniquet and marking the start of ischemia time on this proximal extension.12

We describe a technique, which by no means new, we feel merits highlighting as a simple, useful, and safe digital tourniquet: the whole glove technique. (See Video 1 [online], which details technical pearls for how to appropriately size and apply the whole glove tourniquet.)

As already mentioned, we make no claim to have developed this technique. It was shown to the senior author when he was a resident over 20 years ago and has been described elsewhere in the literature.13 However, its utility was recently reemphasized when the junior author was exposed to it by the senior author and expressed the opinion that it may no longer be known as widely as it ought to be, given its advantages. Novel technical pearls and clinical applications for this technique are described here.

DESCRIPTION OF THE TECHNIQUE

The whole glove technique consists of applying a surgical glove to the operative hand. Although previous descriptions of this technique include the use of a slightly oversize glove with addition of a hemostat for increased digital tourniquet pressure,13 the senior author deliberately chooses a glove that is significantly smaller than the patient’s estimated glove size (2 sizes smaller).

The deliberately undersized glove is then applied to the injured hand (Fig. 1). A slit is made to the most distal tip of the glove on the corresponding operative finger (Fig. 2). The finger of the glove is then rolled proximally to the base of the digit, contributing to exsanguination...
of the digit in a manner analogous to stripping with an Esmarch bandage in the case of forearm or upper arm tourniquet (Fig. 3). It has been of the senior author’s impression that this technique consistently provides sufficient constriction to obtain a bloodless field. Should this not be the case, a hemostat may be used to further tighten the tourniquet at the base of the finger.

The entire hand can then be prepped over the glove, including the exposed finger, with the rolled down glove finger at the base and the remainder of the soiled hand covered with the surgical glove (Fig. 4).

At the end of the procedure, a scissor can be used to split up into the palm along the affected ray all the way to the cuff and then the cuff can be grasped and pulled distally to remove the digital tourniquet before applying subsequent dressing (Figs. 5, 6). A summary of the technique is presented in Table 1.

Benefits of the revisited whole glove technique described here are multifaceted. The deliberate selection of a glove that is too small ensures good constriction at the base of the finger. The rolling of the glove toward the base of the finger has an exsanguinating effect on the finger. The presence of the entire glove on the hand makes inadvertent failure to remove the digital tourniquet unlikely.
This technique is particularly useful for maintaining a sterile field during the setting of trauma to heavily soiled hands, such as is often the case in manual laborers after years of work-related soilage is present. Noninjured, heavily soiled adjacent digits can be “walled off” from the surgical field by the intact fingers of the sterile glove. The use of a whole glove tourniquet also allows for efficiently fashioning >1 digital tourniquet at a time for multi-digit trauma.

We feel that this technique is simple and uses no specialized products (ie, surgical gloves would be widely available in emergency room, clinic, minor surgery operating room, and main operating room venues). It is safe with an inherent feature that would make failure to remove it unlikely and is well tolerated by the patient. The included narrative video provides a detailed description to facilitate incorporation of the whole glove technique clinical practice for those who are not familiar with this method.

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