

CLINICAL VIGNETTE

A novel non-invasive hip traction technique for hip arthroscopy in the below-knee amputation (BKA) patient

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Submitted 6 April 2017; revised version accepted 24 April 2017

ABSTRACT

Prolonged sitting and mobilizing from a seated position are known to exacerbate the symptoms in patients with hip pathology. For patients who lack mobility and require extended periods of time in seated positions, such as amputees, the symptoms of femoroacetabular impingement can be debilitating and limit their ability to operate a wheelchair, use a prosthetic limb or complete activities of daily living. Hip arthroscopy surgery offers a minimally invasive technique to treat hip pathology but requires hip distraction to facilitate instrument maneuverability. Invasive methods of hip distraction have been previously described for use in amputees for hip arthroscopy. We herein describe a non-invasive surgical technique for hip distraction in the below-knee amputation patient.

INTRODUCTION

The symptoms of femoroacetabular impingement (FAI) can be debilitating for amputees who lack mobility and remain seated for extended periods [1]. In prosthetic users, hip pathology may compromise hip motion and impair balanced ambulation. Hip arthroscopy surgery has proven effective in the management of many pathologic hip conditions [2] and may offer relief and the restoration of self-efficacy to below-knee amputation (BKA) patients.

To facilitate instrument maneuverability and adequate exposure of the hip during arthroscopy, traction must be applied to the joint. This poses a problem in BKA patients, as a hip distractor boot cannot be used. Invasive forms of hip traction have been used in amputees [1]. These techniques have unfavorable associated complications [3]. The purpose of this paper is to present a novel non-invasive hip traction technique for hip arthroscopy in the BKA patient.

SURGICAL TECHNIQUE

Patient positioning

The patient is positioned supine on an Advanced Supine Hip Positioning System table (Smith & Nephew, Andover, MA, USA). The non-operative leg and both arms are dressed in a manner similar to that of any hip arthroscopy procedure and a well-padded perineal post is placed between the two limbs.

Limb preparation

Using two 7.5 cm, adult size skin traction kits, the leg is dressed. Bony prominences are well padded. The first bandage is placed on the medial and lateral aspects of the limb (Fig. 1A), and then overwrapped with an elastic bandage. The second 7.5 cm bandage is placed on the anterior and posterior aspects of the limb (Fig. 1B) and the construct is overwrapped using two elastic bandages (Fig. 1C and D). The four traction cords are tied together into a single unit. The

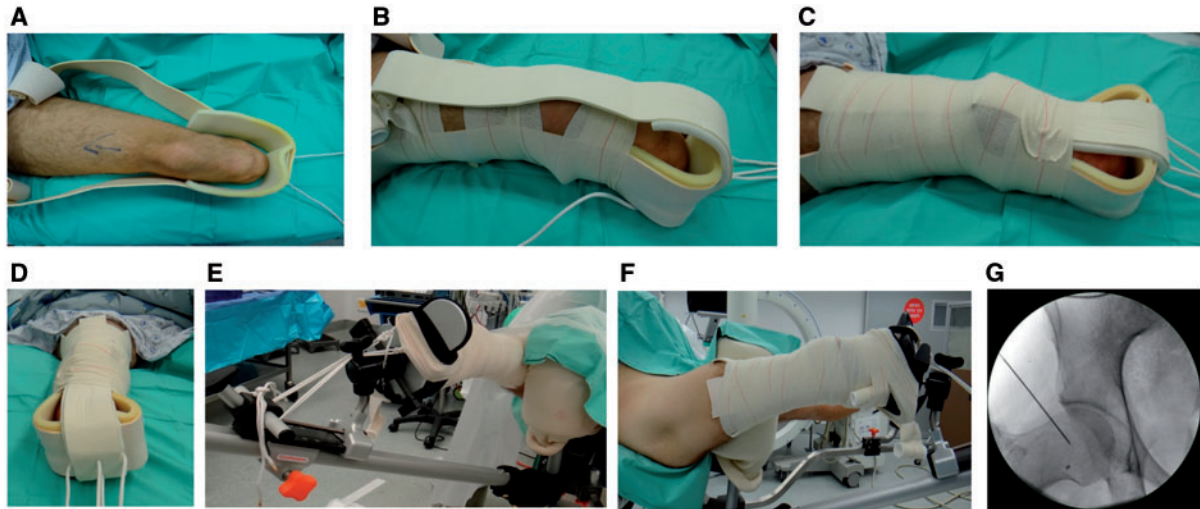


Fig. 1. (A) The first bandage is placed on the medial and lateral aspects of the limb, with the traction cords extending distally. No adhesive tape is used during the application. (B) The second 7.5 cm bandage is placed on the anterior and posterior aspects of the limb, with the traction cords extending distally as well. (C, D) The bandage construct is overwrapped using two elastic ace bandages to secure the bandages to the limb. Additional coban can be applied to assist securing the tension bandages to the limb. (E, F) The four traction cords are tied together into a single unit. The cord is secured to the standard Active Heel Traction Boot and then overwrapped with adhesive tape. (G) Under fluoroscopic guidance, an 18 gauge long spinal needle is inserted into the peripheral compartment from a proximal anteriorlateral point of entry, perpendicular to the femoral neck (Dienst Portal). A 20 ml syringe with normal saline is loaded onto the spinal needle. While observing hip distraction fluoroscopically, normal saline is injected into the joint to break the capsular suction seal. Additional longitudinal traction can be applied gradually under fluoroscopic guidance to achieve the desired distraction.

cord is secured to the standard Active Heel Traction Boot and then overwrapped with adhesive tape (Fig. 1E and F).

Hip distraction

Gentle and gradual traction is applied to the limb without making an attempt to distract the joint fully. Using fluoroscopic guidance, an 18 gauge long spinal needle is inserted into the peripheral compartment from a proximal anteriorlateral point of entry, perpendicular to the femoral neck (Dienst Portal) [4, 5]. A 20 ml syringe with normal saline is loaded onto the spinal needle. While observing hip distraction fluoroscopically, normal saline is injected into the joint to break the capsular suction seal (Fig. 1G). Additional longitudinal traction is applied to achieve the desired distraction. Arthroscopic portals are established according to standard techniques. Surgical procedures can be carried out as planned.

DISCUSSION

We present a novel non-invasive technique for hip distraction in BKA patients. The technique uses skin traction in place of more invasive techniques to achieve the distraction necessary to perform hip arthroscopy. Deep-seated infection in the stump and maintaining the integrity of the bone in BKA patients is extremely important and thus invasive forms of traction are not ideal in BKA patients. Thus skin

traction is an attractive alternative in this population. The complications of skin traction are correlated with the duration of traction and the traction force applied to the limb.

CONCLUSION

Non-invasive skin traction facilitates adequate distraction to perform hip arthroscopy in BKA patients.

CONFLICT OF INTEREST STATEMENT

None declared.

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