Technical Note

# Patient Positioning for Postless Hip Arthroscopy

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**Abstract:** Hip arthroscopy has been on the rise since its inception. Initial descriptions of the procedure required skeletal traction of the operative extremity with countertraction provided by a perineal post. Perineal posts are associated with complications such as perineal nerve palsy, genital laceration, and hematoma formation. Postless traction has been developed to avoid complications related to use of perineal posts. A patient is positioned supine on a postless traction table (Guardian; Stryker, Greenwood Village, CO) with a disposable traction pad. The anterior superior iliac spine is positioned at the distal aspect of the semicircle cutout in the traction pad. The patient is placed in approximately 3° of Trendelenburg positioning. Both lower extremities are secured into traction boots. The operative extremity is prepared and draped in the standard sterile fashion. Traction is applied to the operative extremity with countertraction being applied manually to the pelvis during hip dislocation. Many pathologies around the hip including femoral acetabular impingement can be effectively managed with hip arthroscopy. Postless hip arthroscopy is an effective method of obtaining sufficient traction for hip dislocation. Significant complications related to the perineal post can be avoided with postless traction. We expect postless traction use to increase in hip arthroscopy.

Hip arthroscopy has been on the rise since its inception.[1] Initial descriptions of the procedure required skeletal traction of the operative extremity with countertraction provided by a perineal post. Perineal posts have been associated with complications such as perineal nerve palsy, genital laceration, and hematoma formation.[2,3] Postless traction has been developed to avoid complications related to use of perineal posts.[4,5] Among surgeons performing hip arthroscopy using postless traction, concern over complications related to the perineal post was cited as a common reason for switching from using a perineal post to using a postless traction bed.[4] Superior safety related to the perineum and equivalent efficacy of postless traction have been shown.[6]

## Technique

The patient is positioned supine on the postless Stryker Guardian bed (Greenwood Village, CO) (Video 1). The patient's leg support attachment is kept in place so that he or she can aid in positioning while awake. It is important to ensure that the patient's skin directly contacts the pad with no gown or drape between the patient and the traction pad. The patient is placed distal enough that the anterior superior iliac spine is at the distal-most aspect of the half circle cutout in the traction pad (Fig 1). The bed is set to 3° of Trendelenburg positioning. The feet are placed into the padded Velcro boot liner (Fig 2). Several foot positioning tips are vital to prevent foot slippage. The operative foot and boot liner are wrapped with Coband from the toes to the junction of the boot liner and proximal calf to prevent internal slippage within the liner. Next, the heel and foot are placed into the plastic tensioning boots. The heel must be placed deep within the Velcro boot. The nonoperative leg is placed into the padded boot and then directly into the traction boot, ensuring placement of the padded heal deep into the calcaneal recess of the traction boot. To assist with heel placement deep within the traction boot, the knee is flexed to relax the triceps surae. The operative leg is placed into the traction boot and tightened to maximum tightness while pinching the dial with only the pinky and thumb. The support table is

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**Fig 1.** The patient is in the supine position with the right hemipelvis and leg exposed. The patient's skin is directly in contact with the pad. The patient's anterior superior iliac spine is at the distal-most aspect of the half circle cutout in the traction pad, with the level of the anterior superior iliac spine being palpated in the image.

removed from the bed, and the boots are placed within the traction arms until they click into place (Fig 3).

The patient's arms are positioned folded onto the chest (Fig 4). A blanket is first placed on the patient's chest with the arm with the blood pressure cuff placed first. This arm is padded with an egg-crate cushion. Then, an additional blanket is placed on top of the arm, with the arm with intravenous line access placed over the pad. The intravenous line is then checked for continued infusion. A blanket is placed over both arms and secured into position with circumferential Coband. The patient's gown is

**Fig 2.** The feet are placed into the Velcro boot liner, and the heel is then placed deep into the plastic tensioning boots.

**Fig 3.** The support table is removed from the bed, and the boots are placed within the traction arms.

then flipped up over the patient's arm, and Coband is used once again to secure the arms. Safety straps are applied. The iliac crest is then palpated to ensure that the operative site is still exposed. The height of the bed is set to the surgeon's preference. To protect the equipment, the operative extremity is draped with a 1015 Drape (3M, St Paul, MN) under the leg and a 1010 Drape (3M) proximal to the iliac crest (Fig 5).

Initial preoperative fluoroscopic images are obtained. An anteroposterior image is first obtained, followed by imaging with a 15° angle toward the feet and 15° rolled back toward the radiologic technologist. The hip is then imaged in neutral rotation in extension and 30° of internal rotation, followed by 30° of external rotation. The hip is flexed to approximately 50°, and images are

**Fig 4.** The patient's arms are positioned folded onto the chest with the arm with the blood pressure monitor placed first, followed by the arm with intravenous line access.

**Fig 5.** The patient's final position is shown before sterile draping. The arms have been secured over the chest with exposure of the right hemipelvis and entire right lower extremity.

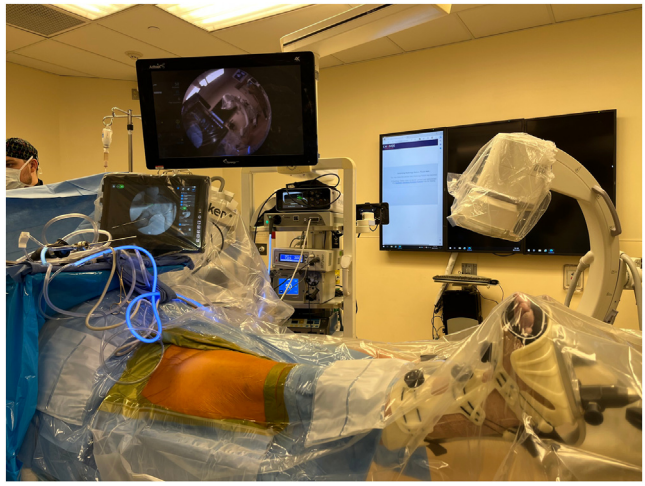

**Fig 6.** Final draping and setup with shower curtain–style drape of right hip positioned on Stryker Pivot Guardian table.

obtained in neutral rotation, 40° of external rotation, and finally, 60° of external rotation. The operative field is then prepared and draped. A shower curtain is applied, and a bar drape is provided to protect the anesthetic equipment from the operative field. The Stryker Hip Check monitor is then draped. The arthroscopic tools and tower are assembled. The rotation of the operative extremity is unlocked to ensure safe dislocation of the hip. Approximately 100 lb of traction is applied to dislocate the hip. It is necessary to provide countertraction to the pelvis during the dynamic phase of the hip dislocation. The foot is internally rotated approximately 30° and secured. The bony landmarks are once again palpated and marked, including the anterior superior iliac spine, iliofemoral line, and greater trochanter. The arthroscopic portals are then provisionally marked. At this point, the patient is prepared for the procedure (Fig 6).

## Discussion

Cases of hip arthroscopy have been on the rise since its description. Many pathologies around the hip, including femoral acetabular impingement, can be effectively managed with hip arthroscopy. Significant complications related to the perineal post can be avoided with postless traction.[6,7] Both beds that require posts and beds that are postless have been shown to be an effective method of obtaining sufficient traction for hip dislocation and performance of hip arthroscopy.[7]

This article describes our technique for patient positioning for postless hip arthroscopy. There are many pearls that can ensure a safe and efficient procedure, as well as pitfalls that can complicate the procedure and lead to complications. A few pearls to ensure adequate visualization include having the awake patient assist in positioning, achieving proper patient positioning on the semicircle cutout in the traction pad, and obtaining preoperative fluoroscopic imaging of all planned shots. To ensure adequate traction, the pearls for setup include applying Coband to the operative leg above the Velcro boot, flexing the foot to ensure deep placement within the traction boot, two finger tightness, applying manual countertraction during traction application, and unlocking rotation of the leg while applying traction. These pearls and pitfalls are summarized in Table 1.

When considering the bed to use in hip arthroscopy, the many pros and cons of postless traction tables must be weighed; these are summarized in Table 2. In many ways, postless traction beds have been shown to be superior to those requiring a post when considering the technical considerations of performing the procedure, as well as the complications. The amount of distraction required to dislocate the hip is less than that required with tables requiring a post.[5] The total operating room time, as well as the time in traction required to perform the procedure, has been found to be less with postless traction.[8] In addition to the technical considerations of performing the procedure, the complications related to traction on the extremity have been shown to be fewer with the use of postless traction tables. A prospective study found that complications related to traction beds occurred in approximately 7.1% of cases.[6] In comparison, postless traction was found to have a 0% incidence of pudendal neurapraxia or perineal soft-tissue injury.[2,6] In addition to groin complications, foot numbness was less frequent in postless hip arthroscopy.[6] In a survey of hip arthroscopists, 71% of surgeons noted a decrease in traction-related complications after switching to postless traction beds.[4] Because of these considerations, we expect postless traction use to increase in hip arthroscopy.[6]

**Table 1.** Pearls and Pitfalls of Postless Hip Arthroscopy

| Pearls | Pitfalls |
|---|---|
| The patient should be kept awake for positioning on the bed. | High friction can make it difficult to change the positioning on the pad when the patient is asleep. |
| The patient must be positioned on the crescent cutout in the table to ensure adequate fluoroscopic visualization. | Failure of appropriate patient positioning can lead to poor fluoroscopic visualization. |
| The bed should be set to Trendelenburg positioning to assist with the effectiveness of traction on the extremity. | Failure of Trendelenburg positioning could lead to patient position changes with traction. |
| The knee should be flexed when placing the foot into the traction boot. | A shallow depth of the foot in the traction boot can lead to loss of traction. |
| The Velcro boot should be overwrapped with Coband on the operative extremity. | Poor foot security of the foot in the Velcro boot can lead to loss of traction. |
| Use thumb and pinky to tighten boots so as to not overtighten. | Traction boots that are loose may lose traction due to foot slippage, whereas traction boots that are too tight may predispose the skin to perfusion compromise and foot pain. |
| Provisional fluoroscopic images should be obtained before draping to ensure adequate visualization. | Late fluoroscopic imaging could lead to obscured fluoroscopic visualization from unrecognized blocks to visualization. |
| The rotation of the foot should be unlocked while traction is applied. | Failing to unlock the foot while traction is applied could increase the difficulty of dislocation. |
| Downward compression should be applied on the pelvis to ensure minimal distal displacement of the patient on the traction pad while traction is applied. | Failing to apply manual countertraction during dynamic traction application could potentially make it difficult to dislocate the hip or change patient positioning. |

**Table 2.** Pros and Cons of Postless Hip Arthroscopy

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|---|
| Pros |
| No pressure-related complications affecting soft tissues of perineum |
| No limitations in hand maneuvers owing to absence of traction post |
| Decreased traction tension required for dislocation |
| Decreased total operating room time and time under traction |
| Cons |
| Increased cost of table acquisition |
| Learning curve in setup |

## Disclosures

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: S.D. is a board member of American Orthopaedic Society for Sports Medicine and Arthroscopy Association of North America; receives speaking and lecture fees from AO North America; receives funding grants from Arthrex; is on the editorial or governing board of *Arthroscopy*; and receives publishing royalties and financial or material support from Springer. All other authors (D.R.W., J.A.R., K.K.) declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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