Technical Note

# The Yoga Mat Technique in Postless Hip Arthroscopy

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**Abstract:** Hip arthroscopy for the treatment of femoroacetabular impingement syndrome with anti-sliding techniques and without the use of a perineal post to achieve hip distraction has increased greatly in the past 5 to 10 years. To access the hip joint, distraction is mandatory to treat intra-articular disorders such as labral tears, acetabular cartilage defects, loose bodies, ligamentum teres tears, and avascular necrosis of the hip. In hip distraction, counter-distraction is needed, and this is achieved with a bulky and cushioned perineal post. Most of the described techniques in hip arthroscopy worldwide use a perineal post, but iatrogenic pudendal nerve, genital lacerations, hematomas, and groin complications have been reported to occur. In Latin American countries, disposable hip pad devices are expensive, and not all the arthroscopic companies provide them. Our yoga mat technique provides enough countertraction to achieve adequate hip distraction. Labral repair, labral reconstruction, and decompression of femoroacetabular impingement syndrome have been achieved properly, reliably, and reproducibly, and no Trendelenburg position is needed. Postless hip arthroscopy is made simple, and positioning the patient is not difficult. Hip surgeons can adapt this technique to a fracture table, a hip distractor, and a standard operating room table.

Postless hip arthroscopy (HA) is increasingly becoming a very common arthroscopic surgical procedure; its diagnostic and therapeutic uses are numerous and commonly directed to treat labral tears, intra-articular cartilage lesions, ligamentum teres tears, and femoroacetabular impingement syndrome (FAIS). Distraction of the hip joint is very important and mandatory in HA when entering the central compartment (CC), and because of this, the surgeon must apply enough force of traction. Although hip distraction is necessary to treat intra-articular disorders, traction-related injuries such as foot palsies, foot lacerations, vaginal or scrotal lacerations, and pudendal nerve dysfunction are very common, and several investigators have recommended limiting traction time to less than 2 hours.

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Entering the CC is the most important step when initiating HA. This is performed blindly with the use of cannulated needles and obturators; an image intensifier is also used in this important step. Sufficient force is needed to distract the head of the femur approximately 10 mm away from the acetabulum, as measured on the image intensifier. This takes no direct account of the thickness of the articular cartilage, which most often is not directly visible.[1-3]

HA can cause some significant iatrogenic lesions, such as scuffing of the femoral head, labral penetrations, and labral punctures while accessing the CC. This access is more difficult than with other joints because of the hip being highly constrained, deep, and strong in musculature and anatomy. Surgeons typically use a hip fracture table or a commercial specialized hip distractor to obtain proper distraction and perform a reproducible and reliable surgery.[3] Hip counter-distraction is needed in HA and is achieved with the placement of a bulky cushioned perineal post measuring approximately 25 to 30 cm; this width is necessary and very important to avoid lesions of the pudendal and perineal nerve, erectile dysfunction, and vaginal or scrotal lacerations.[4-7]

## Surgical Technique (With Video Illustration)

A yoga mat is placed on a standard operating room (OR) table. The yoga mat (Sunshine Yoga, Charlotte, NC) is cut in half with conventional scissors; one half

will be placed on the posterior trunk of the patient on top of the OR table and the other half will be cut in pieces to protect the bony prominences (Fig 1). HA is performed with the patient in the modified supine position. The hip is distracted with a hip distractor (ArthroMX; San Pedro Garza Garcia, Mexico) or a hip fracture table (MAQUET Gmbh, Rastatt, Germany), with the patient receiving general anesthesia, and no muscle relaxants are used, although they may be added. The standard OR table is covered by the yoga mat foam placed under the upper body of the patient (Fig 2). Both arms are placed over the chest in a figure of 8 or X position, and the patient is secured on the OR table. Bony prominences are protected with the yoga mat foam strips at the level of the elbows, wrists, feet, and ankles and are rolled with Coban (3M, Austin, TX) (Fig 3). The patient's hands are left free for intravenous line and medication passage, which are double checked by the anesthesiologist. A long blanket is placed around the patient's upper body. Heavy-duty duct tape (3M) is placed in an X or figure of 8 fashion posteriorly, securing the patient's upper body on the OR table.

The patient is prepped and draped in a standard fashion with a vertical isolation drape. Radiographic and anatomic landmarks are marked on the patient's operative hip, and portals are established to access the peripheral compartment and CC: an anterolateral portal used for vision, immediately anterior to the trochanteric tip; a paratrochanteric space portal is used as a working portal, situated 3 cm distally from the anterolateral portal and over the anterior trochanteric border; and a new modified mid-anterior portal, which is located 1.5 cm above and between the anterolateral and paratrochanteric space portals, which we call the trochanteric triangle portal (Fig 4). The anterior hip bursa is resected with a shaver or a radiofrequency wand, and a longitudinal capsulotomy is performed posteriorly to access the head–neck junction to perform a femoro-osteochondroplasty for the cam asphericity. If there is a pincer deformity, an acetabuloplasty is performed without distraction.

Afterward, an arthroscopic dynamic impingement test is performed with the help of the surgical assistant, fellow, or nurse, and it will be useful to evaluate the site of impingement and the femoro-osteochondroplasty. After finishing on the PC, a surgical assistant or nurse technician will place the foot and attach it to the hip fracture table to distract the hip under controlled arthroscopic vision (Figs 5 and 6). It is very important to tell the anesthesiologist when you are beginning your distraction, because if the yoga mat foam is not well secured, the patient can slide under the sterile field and fall from the OR table. This is easily prevented by the anesthesiologist's careful monitoring (Table 1) (Video 1).[7-9]


**Fig 1.** The yoga mat for postless hip arthroscopy.

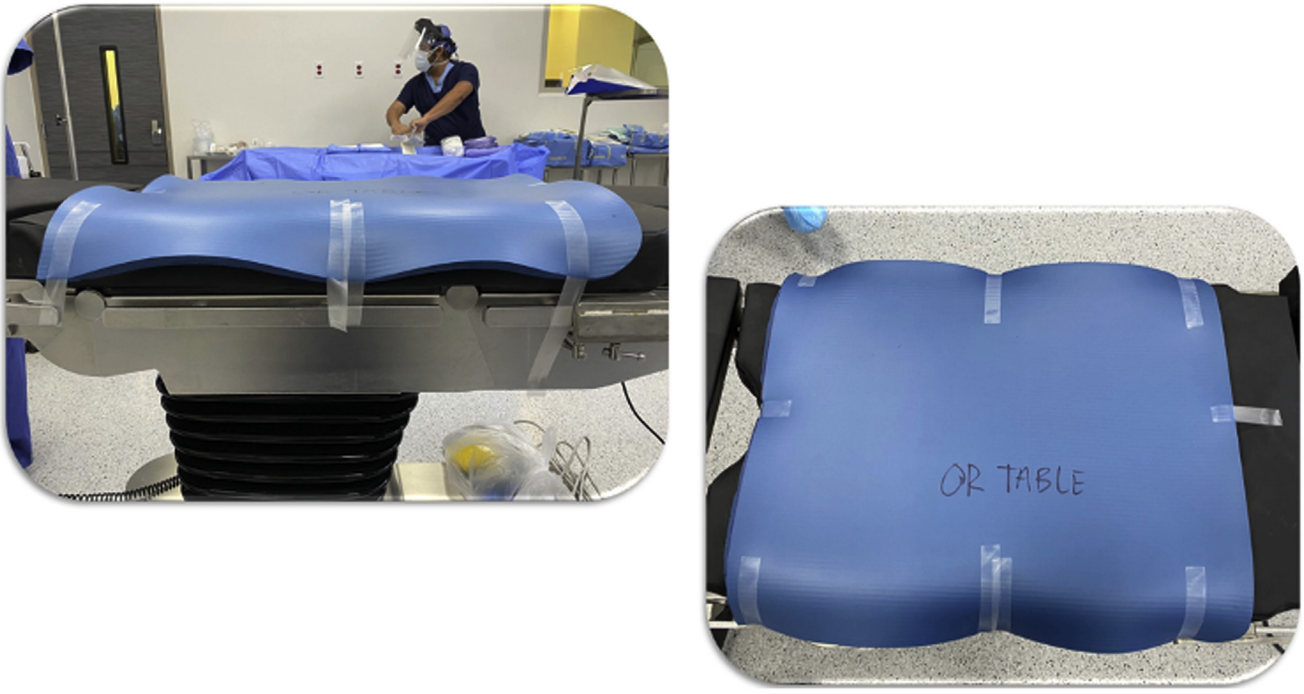


**Fig 2.** The yoga mat placed in a standard operating room table.

## Discussion

Postless HA has evolved greatly in the past 5 years because of the attention paid to the iatrogenic pudendal nerve palsy and the devastating groin lesions. The special disposable hip pad equipment is usually not available in third-world countries, and most of the time the arthroscopic companies will not provide them; therefore, performing HA safely can become very

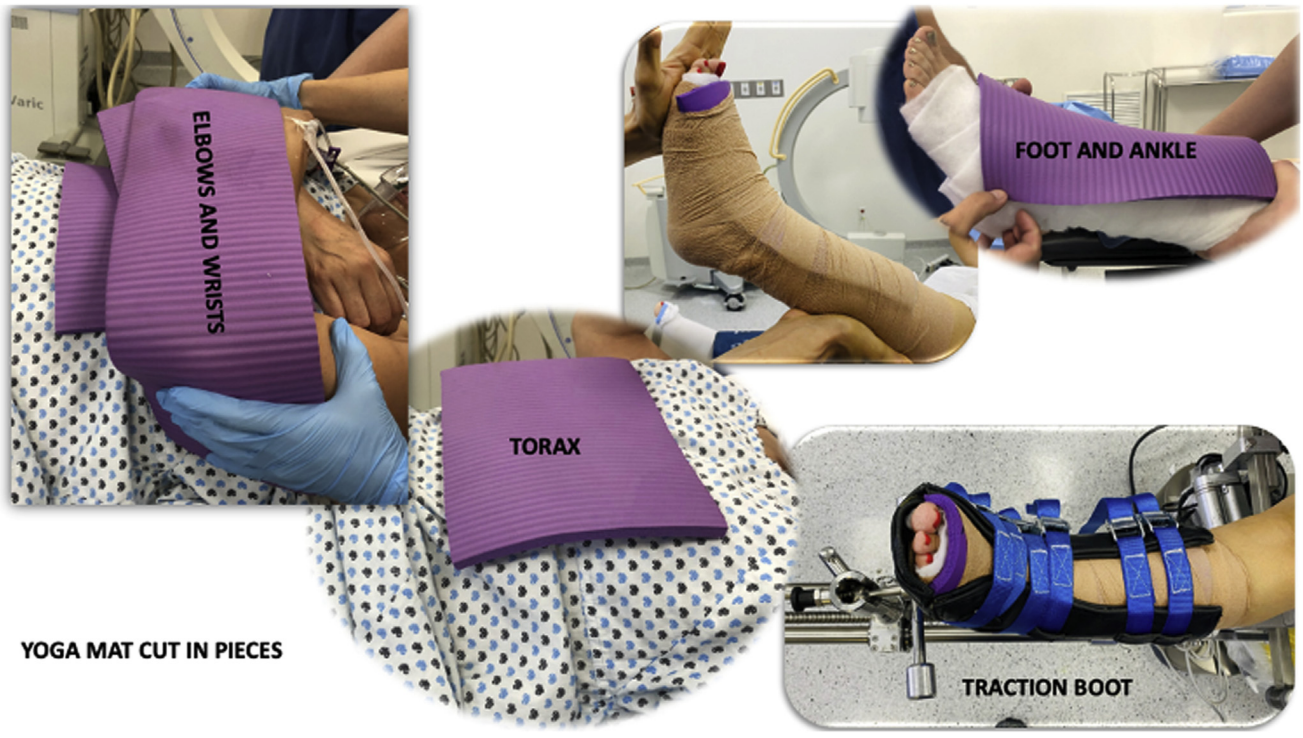


**Fig 3.** The yoga mat is cut in pieces and placed at the thorax, elbows, wrists, and operative foot to protect bony prominences and avoid iatrogenic lesions and nerve dysfunctions.

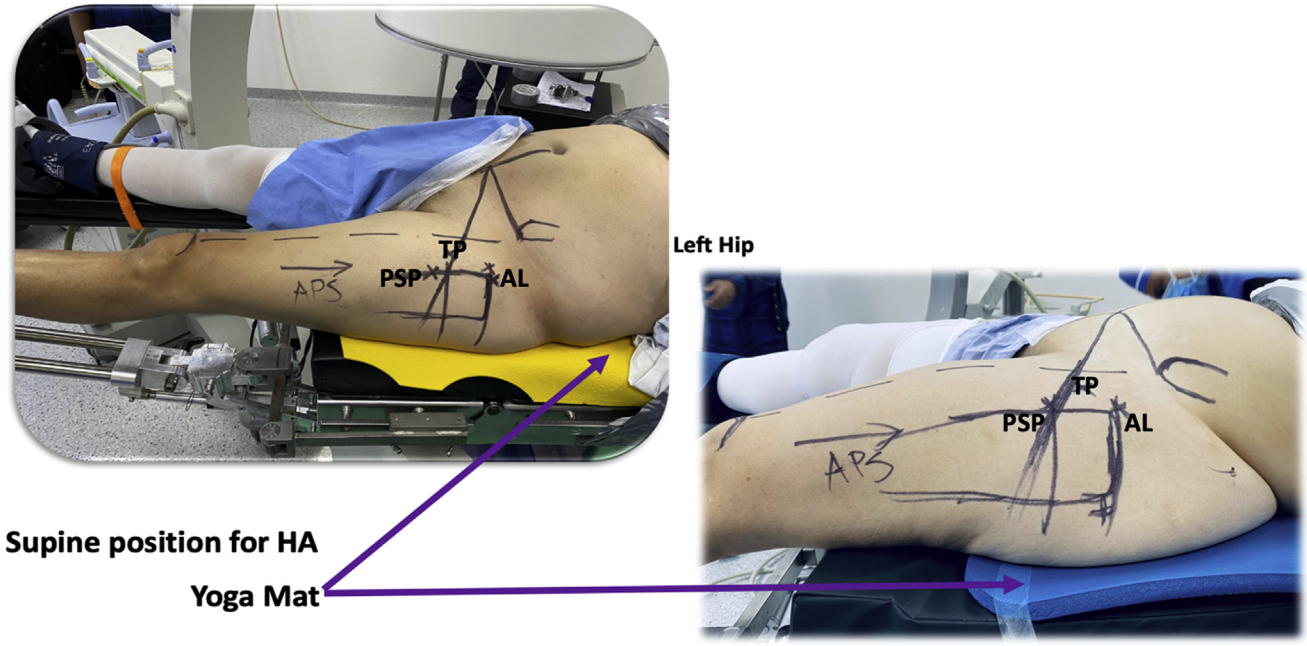


**Fig 4.** Hip arthroscopy with the patient in the supine position with the yoga mat placed on the standard operating room table under the posterior trunk of the patient. Observe the anterolateral portal (AP; vision), the peritrochanteric space portal (PSP; working portal), and triangle portal (TP; anchor placement and working).

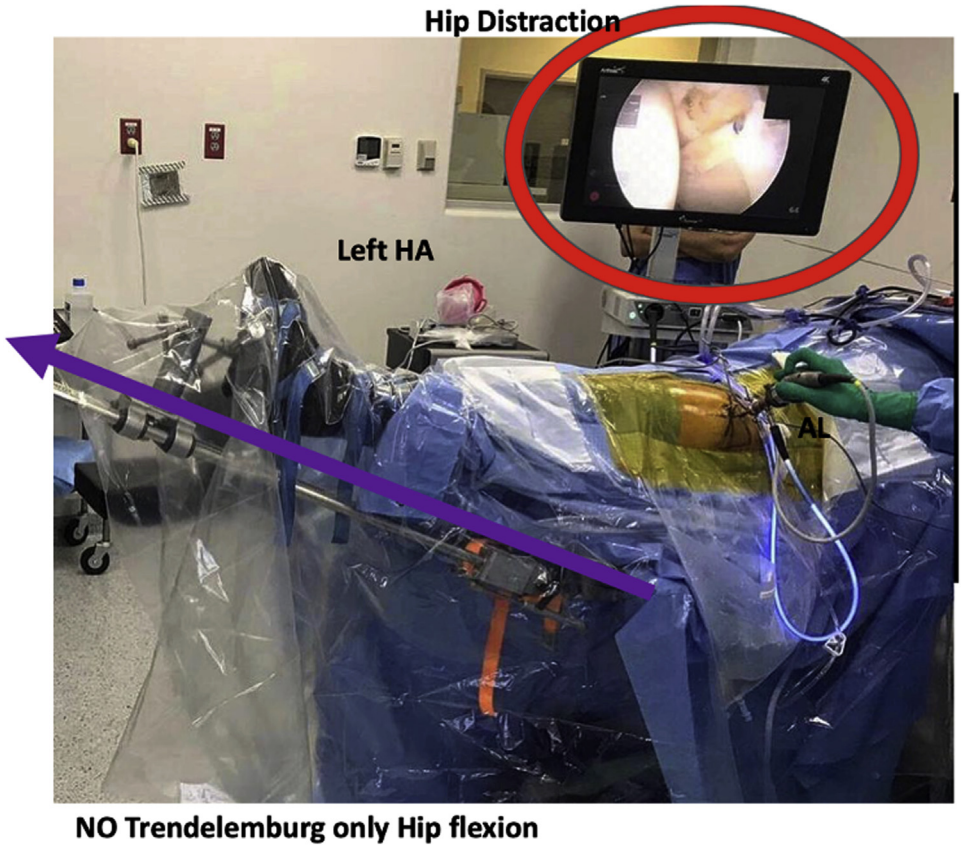


**Fig 5.** Hip arthroscopy (HA) in the supine position with no Trendelenburg, only hip flexion. Observe the distraction (red circle) of more than 2 cm.

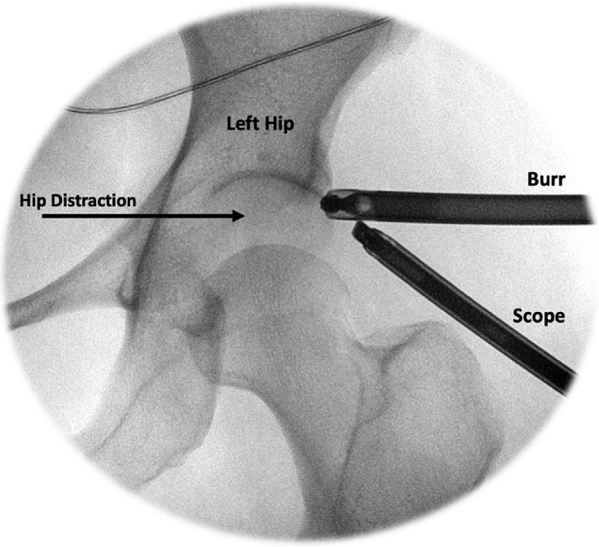


**Fig 6.** Left hip with an acetabular rim recession. Observe the distraction in the intraoperative fluoroscopic image.

difficult and sometimes impossible. Merrell et al.[8] performed HA without a perineal post, but they used a deflated taped beanbag positioned and contoured in the lateral portion of the patient's body, and they added a blanket to the abdomen of the patient, similar to our technique, although beanbags are not always available in hospitals. They conclude that this is a very simple technique, and the risk of nerve injuries is minimal.

Mei-Dan et al.[9] demonstrate in their surgical technique no difficulty in accessing the hip joint, distraction is not an issue, and their positioning is quick and easy and requires no special equipment. Their theory is that distraction without a post should eliminate the perineal pressure-related complications of the pudendal and perineal nerves, as well as the delicate tissues of the perineum. They use a Trendelenburg position to use gravity as countertraction. Kollmorgen et al.[1] mention that while considering the risks and limitations of their technique to achieve safe distraction, the surgeon should keep in mind the following complications: lighter patients, i.e., less than 120 pounds, may require greater degrees of Trendelenburg to achieve distraction.

Jimenez et al.[10] conclude that postless surgery has become a popular method of performing HA and that although various techniques exist for achieving traction without a post, the majority require special beds and special equipment. Their technique can be performed with any hip traction table, at zero additional cost, and with the patient leveled before procedure starts.

Salas et al.[11] started performing postless HA with the yoga mat technique because of the expensive pink pad or the disposable hip kit ($100-500 USD), which most of the time is unattainable for patients and insurance companies. Their technique does not require a Trendelenburg position to achieve a hip distraction.

Limitations exist with the postless HA technique, as with all arthroscopic techniques. We always recommend performing a trial traction test manually before surgery and posteriorly with the hip distractor with fluoroscopic control, because of the risk of the patient sliding down the OR table and because of the risk of not producing the proper countertraction (Table 2). Our yoga mat technique provides enough countertraction to achieve adequate hip distraction; none of our patients has ever slid from the OR table while in surgery. Labral repair, labral reconstruction, and decompression of FAIS have been achieved properly, reliably, and reproducibly. We believe that postless HA is made simple with the yoga mat, which is also cost-effective. Positioning the patient is not difficult, and the surgeon can adapt this technique to a fracture table, a hip distractor, or a standard OR table. Adequate hip distraction is achieved, and the surgeon can perform anything from a basic FAIS decompression to a complex labrum reconstruction.

**Table 1.** Pearls and Pitfalls of the Yoga Mat Technique in Postless Hip Arthroscopy

| Pearls | Pitfalls |
|---|---|
| The posterior part of the yoga mat has to be in contact with the posterior trunk of the patient to prevent slippage. | Patient slippage due to poor patient positioning on the OR table. |
| Always secure the patients upper body on the OR table to help with the counter traction when distracting the hip. | The patient's positioning toward the OR table has to be very smooth to prevent nerve dysfunction to any bony prominences. |
| Protect bony prominences of the thorax, elbows, wrists, and operative foot with the cut pieces of the yoga mat. | Blockage of the intravenous line on hands or arms due to excessive compression when positioning the patient. |
| Always perform a manual trial traction before surgery to observe if your patient slips off the OR table. | Do not place any blankets between the yoga mat and the patient. |
| Perform a trial traction with your hip fracture table or distractor to observe whether your patient slips off the operating room table. | A failed distraction of the hip and an incomplete surgery. |
| Ask the anesthesiologist to observe motion and slippage of the patient when distracting the hip. | |

OR, operating room.

**Table 2.** Advantages of the Yoga Mat Technique in Postless Hip Arthroscopy

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| 1. There is no need of the perineal post. |
| 2. There are no iatrogenic lesions to the perineal nerve and pudendal nerve by compression with the post. |
| 3. No scrotal or vaginal lacerations occur. |
| 4. The patient can be positioned on a regular operating room table. |
| 5. There is no need for gravity or a Trendelenburg position to help with the distraction for countertraction. |
| 6. Hip injections are easily performed with this technique. |
| 7. The surgeon can perform anything from a basic hip arthroscopy for FAIS to a labrum reconstruction, as well as AVN core. decompression, open FAIS surgery, and other intra-articular disorders of the hip. |
| 8. The procedure is reliable and reproducible. |
| 9. Low cost (the yoga mat can be re-used). |
| 10. Body weight is not a contraindication (we have used this technique in patients who are thin, patients with normal- weight, and patients with obesity). |

AVN, avascular necrosis; FAIS, femoroacetabular impingement syndrome.

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