

The Tutankhamun Technique in Hip Arthroscopy



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Abstract: Hip arthroscopy has been increasing tremendously in the past decade and is a very common surgical procedure to repair femoroacetabular impingement. To access the hip joint, distraction is mandatory to treat intra-articular disorders such as labral tears, cartilage loose bodies, and ligamentum teres tears and to evaluate the condition of the femoral head and acetabular cartilage. To distract the hip, counterdistraction is needed, and this is achieved with placement of a bulky and cushioned perineal post. Most of the described techniques in hip arthroscopy use a perineal post, whereas others use beanbags to place the patient's body on the surgical table. Still others do not use a post at all but rather use gravity and a Trendelenburg position to achieve distraction. Our technique does not use a perineal post but instead uses heavy-duty tape over the patient's upper body, which is placed on a normal operating room table to distract the hip while entering the central compartment.

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 (FAI). Distraction of the hip joint is very important and mandatory in HA when entering the central compartment (CC). 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 under 2 hours.¹ 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 (Table 1). This takes no direct account of the thickness of the articular cartilage, which most often is not directly visible.^{1,2} 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 Counterdistraction 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

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The authors report that they have no conflicts of interest in the authorship and publication of this article. Full ICMJE author disclosure forms are available for this article online, as [supplementary material](#).

Received April 27, 2018; accepted July 30, 2018.

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2212-6287/18508

<https://doi.org/10.1016/j.eats.2018.07.014>

Table 1. Tips and Pearls of the Technique

1. Use duct tape or a strong surgical tape for patient positioning.
2. Protect bony prominences of elbows and wrists with an egg crate or foam.
3. Place an operating room blanket over the egg crate and upper body, and secure it posteriorly with duct tape.
4. Ask the anesthesiologist whether the intravenous line is blocked.
5. The anesthesiologist must be constantly monitoring the oxygen saturation and intravenous line of the patient.
6. Place the duct tape first in a figure of 8 or X shape well attached to the metallic edges of the operating room table (do this 4-6 times).
7. Always do a manual trial traction before surgery to observe whether your patient slides off the operating room table.
8. Perform a trial traction with your hip fracture table or distractor to observe whether your patient slides off the operating room table.

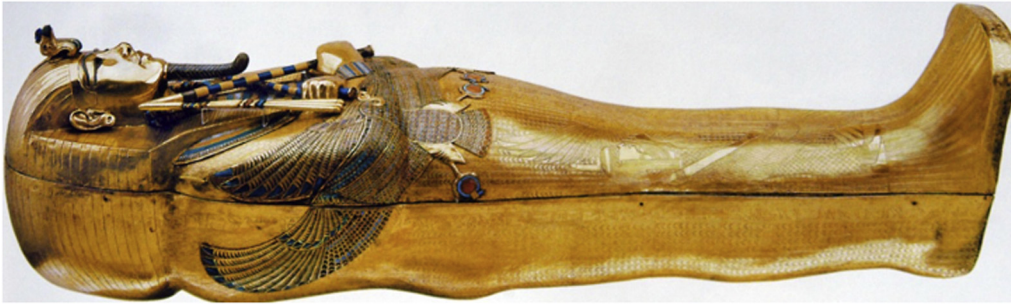


Fig 1. The pharaoh Tutankhamun. Observe how his hands and elbows are placed and wrapped over his chest with an Egyptian bandage in his tomb.

important to avoid lesions of the pudendal and perineal nerve, erectile dysfunction, and vaginal or scrotal lacerations.⁴⁻⁶

Surgical Technique

HA is performed with the patient in the modified supine position, supported on a conventional or a standard operating room (OR) table. The hip is distracted with a hip distractor (ArthroMX, San Pedro Garza Garcia, Mexico) or a hip fracture table (MAQUET GmbH, Rastatt, Germany), under general anesthesia, and no muscle relaxants are used, although they may be added. The upper body of the patient is prepared in the Tutankhamun fashion (Figs 1 and 2). Both arms are placed over the chest in a figure of 8 or X position. Bony prominences are protected with an egg crate foam at the level of the elbows and wrists (Fig 3). 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, Austin, Texas) is placed in an X or figure of 8 fashion posteriorly, securing the patient's upper body on the OR table (Fig 4). The duct tape is wrapped around the patient several times (4-6 times), and the tape is stuck to the metallic edges of the OR table (Fig 5). Observation of the patient's thoracic motion, chest respiration, and intravenous line passage is done by the anesthesiologist. A trial traction is performed posteriorly with the image intensifier, first manually and then with the hip distractor or fracture table (Video 1). The patient is prepped and draped in a standard fashion. 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 used as a working portal, situated 3 cm distally from the anterolateral portal and over the anterior trochanteric border; and a new modified midanterior portal, which is located 1.5 cm



Fig 2. Tutankhamun shoulders and elbows are well secured with an Egyptian wrap or bandage. Observe Tutankhamun's hands, which are free of the wrap. The posterior part of his body is well secured in a figure of 8 or X.

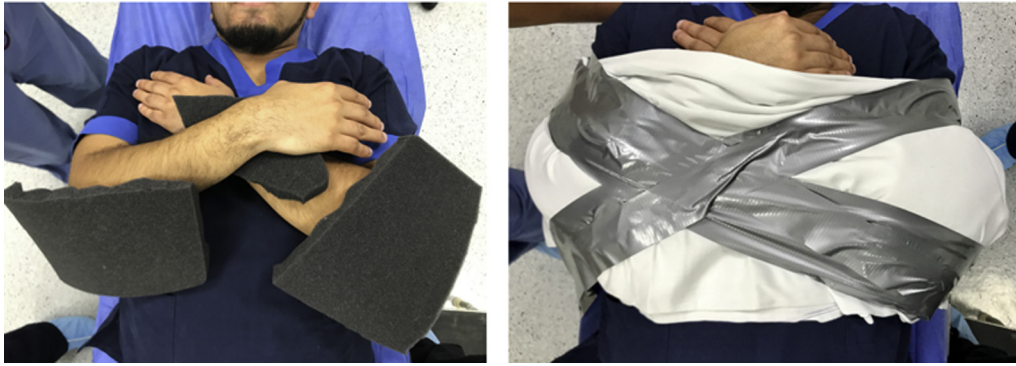


Fig 3. The Tutankhamun technique reproduced on the patient's upper body. Observe the egg crate placed on the bony prominences to avoid iatrogenic injuries. The figure on the right shows blankets and duct tape in a figure of 8 or X.

above and between the anterolateral and paratrochanteric space portals, which we call the trochanteric triangle portal (Fig 6). The anterior hip bursa is resected with a shaver or a radio frequency wand, and a longitudinal capsulotomy is performed posteriorly to access the head-neck junction to perform a femoro-osteochondroplasty for the cam deformity. 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 free foot and attach it to the hip fracture table or distractor clamp to distract the hip under controlled arthroscopic vision. It is very important to tell the anesthesiologist when you are starting traction, because if the duct tape 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.⁷⁻⁹

Discussion

HA has evolved tremendously in the past years. In its initial years, the procedure was performed with pulleys and strings to achieve proper distraction and to enter the CC. There were no specialized commercial perineal posts, cannulated dilators, or obturators to access the hip. All of these specialized instrumentations were developed in later years to make access to the hip easier, simple, and reproducible. This special equipment is usually not available in third world countries, where HA can become very difficult and sometimes impossible. Merrell et al.⁷ 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. Eriksson et al.¹ reported that the traction force needed to achieve sufficient visualization of the hip joint is 300 to 500 N (67-112 foot-pounds), which is necessary to repair a labrum. Mei-Dan et al.⁸ demonstrate no difficulty accessing the hip joint with their technique. 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.

The senior author (A.P.S.) started performing HA without a perineal post and with the Tutankhamun technique after performing surgery on a patient with osteonecrosis of the femoral head and FAI. This patient presented postoperatively with erectile dysfunction, which resolved at 6 weeks with no complications.

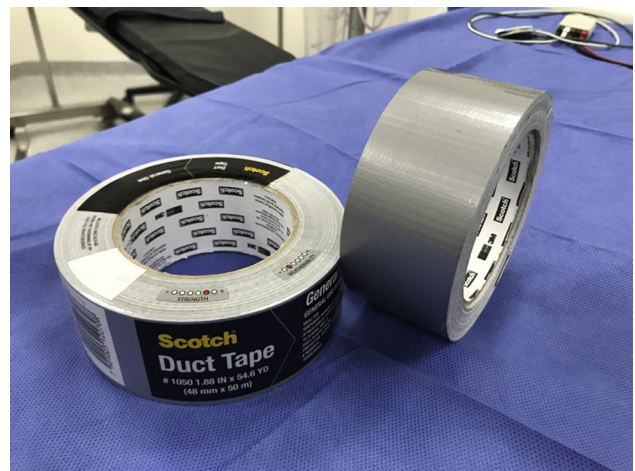


Fig 4. Standard duct tape used for the Tutankhamun technique.

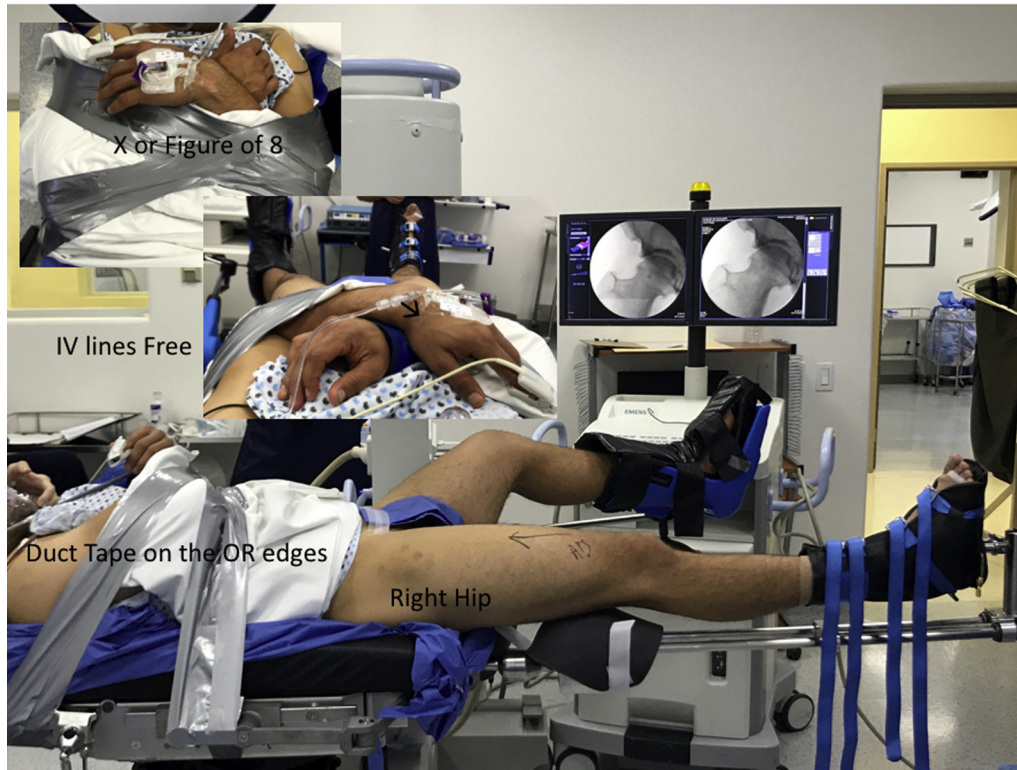


Fig 5. Supine position for a right hip arthroscopy on a normal operating room (OR) table and the Tutankhamun technique. Observe the figure of 8 or X on the superior left picture and the intravenous (IV) line placed on the left hand free of the tape and wrapping technique.

Limitations exist with this technique, as with all HA techniques. Thus, we always recommend first performing a trial traction test manually and posteriorly with the hip distractor 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 Tutankhamun technique with heavy-duty duct tape provides enough countertraction to achieve adequate hip distraction, and none of our patients has ever slid from the OR table while in surgery. Labral repair, labral reconstruction, and decompression of FAI deformities have been achieved properly, reliably, and reproducibly.

HA is made simple with the Tutankhamun technique, 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.

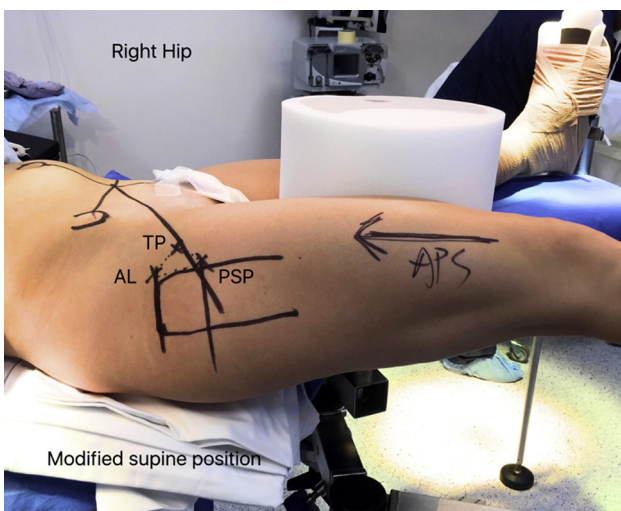


Fig 6. Right hip in the modified supine position. Observe the anterolateral vision portal (AL) and the working portals (peritrochanteric space portal [PSP] and triangle portal [TP]). The perineal pad is used only for patient positioning.

Table 2. Advantages of the Technique

1. There is no perineal post usage.
2. There are no iatrogenic lesions to the perineal nerve and pudendal nerve by compression with the post.
3. There are no scrotal or vaginal lacerations.
4. The patient can be positioned on a regular operating room table (only the leg distractor is attached).
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 distraction.
7. The surgeon can perform anything from a basic hip arthroscopy for femoroacetabular impingement decompression to a labrum reconstruction, as well as treat other intra-articular disorders of the hip.
8. The procedure is very reliable and reproducible.

Adequate hip distraction is achieved, and the surgeon can perform anything from a basic FAI decompression to a labrum reconstruction.

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