

Published: October 31, 2022

**Citation:** McCahon J., 2022. Is Post-less Hip Arthroscopy Here to Stay? Medical Research Archives, [online] 10(10).  
<https://doi.org/10.18103/mra.v10i10.3234>

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**DOI:**  
<https://doi.org/10.18103/mra.v10i10.3234>

ISSN: 2375-1924

## RESEARCH ARTICLE

### Is Post-less Hip Arthroscopy Here to Stay?

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#### ABSTRACT

Hip arthroscopy is one of the fastest growing procedures amongst orthopedic sports medicine surgeons. The procedure has recently entered its 4<sup>th</sup> decade of being performed and over this time many evolutions have occurred to the procedure to allow for improved efficiency and outcomes. In spite of these rapid evolving improvements, the risk of complication and untoward outcomes still exist due to the complexity of the procedure and the delicate anatomy of the surgical region. Perineal and sciatic nerve injuries related to the use of a perineal post for joint distraction are among the most devastating complications associated with hip arthroscopy. In order to combat these risks, a growing movement toward post-less arthroscopy has occurred. This technique allows for joint distraction without the need for a rigid post within the perineal region, thus decreasing the potential for nerve related complication. This manuscript aims to explore the arm of joint distraction in hip arthroscopy and examine the staying power of post-less hip arthroscopy.

## Introduction

Hip arthroscopy is a minimally invasive diagnostic and therapeutic procedure used to treat a variety of intra and extra-articular pathology of the hip, particularly in the young, active population. Specifically, hip arthroscopy allows for treatment of labral tears, intra-articular cartilage lesions, ligamentum teres tears, and femoroacetabular impingement syndrome (FAIS).<sup>1</sup> Hip arthroscopy was first described in 1931 by Michael Burman; however, it was not until the 1990s when it became widely adopted.<sup>2</sup> A major limitation for the delay in the utilization of hip arthroscopy for over 60 years was the technical advances needed to sufficiently access and visualize the hip joint, including adequate traction to overcome the inherent stability of the hip joint and access the central compartment to treat intra-articular pathology.

Accessing the hip joint is much more difficult compared to other joint arthroscopies typically performed (such as the knee or shoulder) due to the hip being a deep, highly constrained joint with strong musculature and anatomy normally providing great joint stability. Prior to the commencement of the surgical procedure, adequate joint distraction must be obtained to permit joint entry. Traditionally this has been achieved via longitudinal traction on the surgical limb with a perineal post being utilized to provide counter-tension. Entering the central compartment is the crucial first step of hip arthroscopy, and it is

very challenging for the operative surgeon to do so. This is performed utilizing cannulated spinal needles, obturators, and dilators while utilizing intraoperative fluoroscopy. Sufficient force (typically 62 to 120 lbs. of distraction force) is needed to adequately distract the femoral head approximately 10 millimeters from the acetabulum to perform this step safely while minimizing iatrogenic chondral damage to the femoral head or acetabulum or damaging the labrum.<sup>3</sup> Therefore, the importance of achieving adequate distraction to perform this procedure cannot be understated.

Advances in instrumentation and surgical technique have allowed for an explosion of surgical hip arthroscopies, resulting in an 18-fold increase in the US from 1999 to 2011.<sup>4</sup> In spite of these rapidly occurring advances though, the risk of complication and untoward outcomes still exist due to the complexity of the procedure and the delicate anatomy of the surgical region. Perineal and sciatic nerve injuries related to the use of a perineal post for joint distraction are among the most devastating complications associated with hip arthroscopy. In order to combat these risks, a growing movement toward post-less arthroscopy has occurred. This technique allows for joint distraction without the need for a rigid post within the perineal region, thus decreasing the potential for nerve related complication. This manuscript aims to explore the arm of joint distraction in hip

arthroscopy and examine the staying power of post-less hip arthroscopy.

#### *Early Techniques Utilizing a Perineal Post:*

A variety of techniques have been described to gain access to the hip, with Glick et al first reporting on the use of hip arthroscopy via the lateral approach in 1987.<sup>5</sup> Subsequently, Byrd would later describe the procedure as performed in the supine position in 1994.<sup>6</sup> Regardless of patient positioning, a similarity among all of the early techniques included the use of a post in the perineal region to aid in counter-traction, allowing further distraction of the hip joint while stabilizing the patient on the bed. The perineal post was classically described as “large, bulky, and cushioned”, typically measuring 25-30 cm in width to avoid lesions to the pudendal and perineal nerve, erectile dysfunction, and vaginal/scrotal lacerations.<sup>7</sup>

During hip arthroscopy, the perineal post results in high force vectors obliquely against the patient’s inner thigh and groin, causing lateralization and distalization of the femur, providing distraction and access to the hip joint. It has been shown that for every increase in 1 lbs. traction force at the time of hip arthroscopy increased the likelihood of a nerve event by 4%.<sup>8</sup> As such, distraction has been associated with a number of potential complications.<sup>9</sup> The use of perineal post during hip arthroscopy has been associated with both pressure-related soft tissue damage to the perineum and compression-related neuropraxias and potentially

permanent injury to the pudendal nerve and other surrounding nerves.<sup>10-13</sup> Pudendal nerve palsy is among the most common complications after hip arthroscopy with a perineal post, with a reported rate of 4.5%.<sup>14</sup> Sexual dysfunction of a transient or permanent nature may result from these complications. Additionally, soft tissue complications such as scrotal and labial necrosis have been described. Given that hip arthroscopy is an elective operation typically performed on young, active, healthy patients, minimizing iatrogenic complications is of the utmost importance. To limit these complications, investigators have recommended limiting traction time with the use of a perineal post to less than two hours.<sup>1</sup>

#### *Abandoning a Perineal Post, Transitional Period:*

Given the potential catastrophic iatrogenic complications associated with a perineal post during hip arthroscopy, many within the orthopaedic community have moved towards alternative methods for accessing the hip joint during arthroscopy. One of the earlier techniques for post-less hip arthroscopy was described by Flecher et al, where they performed external fixation with threaded pins inserted in the femoral diaphysis and the roof of the acetabulum.<sup>15</sup> These authors reported no neurologic complications in a series of 23 patients. The use of external fixator pins comes with their own potential complications, including infection, fracture, and increase post-operative pain.

Merrel et al. described a technique with the use of a bean bag wrapped around a patient's chest and abdomen and then taped to the bed, allowing distraction of the hip.<sup>16</sup> These authors reported no issues with distraction or access in a series of 30 patients; however, the authors still used a perineal post during initial positioning and induction of anesthesia. This technique only reduces the amount of time during which the perineal post is used rather than eliminating its use completely. Mei-Dan et al. described the use of a post against the medial thigh, 10 cm distal to the perineum.<sup>17</sup> These authors were successful in decreasing perineal and groin complications, reporting none in over 2,000 hip arthroscopies. The use of a post against the medial thigh, however, presents new potential complications, such as obturator neuropraxias.

#### *Newer Post-less Techniques:*

More recently, multiple investigators have been trialing different techniques to increase the friction between the patient and the table with low degrees of Trendelenburg, allowing for adequate distraction without the use of any post. Examples of this include utilizing the "pink pad," commercial yoga mats, as well as commercially available distraction systems (i.e. Pivot Guardian Hip System, Stryker).<sup>18-20</sup>

This technique can be performed on a standard OR table and has leg attachments

that can be utilized for the surgical procedure.

A post-less system utilizing friction combined with Trendelenburg positioning can be performed in either the supine or lateral position. In this technique, an "anti-friction" pad is placed on the OR table that rests underneath the patient's torso/buttocks. The patient's feet are then placed in traction "ski boots" that must have the patient's heels fully seated into in order to ensure the foot does not slip out during traction. At this point, the patient can be flipped to a lateral position if the operative surgeon prefers (Figures 1A and 1B). Intra-operative fluoroscopy can then be brought in non-sterilely to ensure adequate x-ray views of the hip can be obtained. Traction force can then be applied to estimate if enough traction force can be used to distract the joint (Figure 2). It is important at this point, once confirming adequate x-ray views non-sterilely, to release the traction as the patient is prepped and draped in standard fashion in order to limit traction time (Figure 3). Once the time-out is complete and the surgeon is ready to start the surgery, then the traction force may be re-applied to distract the joint. If inadequate joint distraction is seen with less than 120 lbs. of distraction force, it is important to not increase the traction force, as puncturing the capsule with a spinal needle typically releases the negative intra-capsular pressure, providing more joint distraction without the need for more distraction force.

**Figures:**

Figures 1A and 1B. The patient is positioned in the lateral decubitus position. A beanbag is used to maintain the upright position of the hip. The table is in 15° of Trendelenburg and the antifriction pad is beneath the bed and patient. The operative foot is placed

into the boot and the non-surgical leg is resting on the bed extension flexed to 45° and padded. A soft triangle wedge is placed between the thighs to maintain 15-20° of hip abduction.

Figure 1A.





Figure 1B.



Figure 2. The surgical leg is pulled into manual traction for joint distraction prior to commencement of surgery. The arrow

denotes 50 pounds of traction across the joint in this post-less hip arthroscopy performed in the lateral decubitus position.



Figure 3. For hip arthroscopy performed in the lateral decubitus position, the C-arm is brought under the bed at the level of the hip point to allow for an AP image. The start of

the surgery is pictured here with central compartment access being obtained utilizing a spinal needle under fluoroscopic guidance.





In a prospective study of 1,000 post-less hip arthroscopies using the pink pad and slight Trendelenburg positioning, Meidan et al. found no groin-related soft-tissue or nerve complications at two year follow up.<sup>9</sup> All patients achieved adequate distraction of the hip except for two patients that were unable to achieve adequate access both with and without a post. The Trendelenburg position was used to aid in increasing distraction force; however, these authors demonstrated that the mean Trendelenburg was 11 +/- 2 degrees, which were of moderate difficulty and non-disorienting for the surgeon and did not have any negative effects on hemodynamics. Of note, for patients weighing greater than 120 pounds, greater degrees of Trendelenburg may be needed in order to provide enough distraction in order to access the hip joint.<sup>19</sup> These authors concluded that this technique is able to limit the complications of an intraoperative pudendal nerve palsy and soft tissue damage to the groin seen with the use of a typical perineal post, allowing safe, adequate, and reproducible access to the hip joint. An important technical pearl to this technique is that the friction generated between the skin and the pink pad can potentially cause increased anterior pelvic tilt, affecting lumbar lordosis (which does not normally occur with hip arthroscopies performed with a perineal post).<sup>19</sup>

If an increase in lumbosacral lordosis is appreciated by the surgeon when positioning the patient, it is important to

account for this and adjust the patient to decrease lumbosacral stress and allow for adequate intraoperative pelvic x-rays.<sup>19</sup>

A recent study showed that with the use of post-less distraction for hip arthroscopy, there was no noticeable reduction of venous blood flow or alteration of nerve function in the operative leg, with reduced muscle damage as compared to the use of a perineal post.<sup>21</sup>

While the literature supporting the post-less hip arthroscopy is growing, there remains a paucity of literature directly comparing hip arthroscopy with and without a perineal post and the clinical outcomes associated with each. In a retrospective comparative study of hip arthroscopy with and without a post, Schaver et al. found that post-less hip arthroscopy had shorter total time in the operating room, shorter traction time, and shorter length of surgery.<sup>22</sup> Although this study found that post-operative pain scores in the PACU were similar between both groups, time to discharge was shorter in the post-less group. No pudendal neuropraxias or groin-related soft-tissue injuries occurred in either group.

The major draw-back of transitioning to a post-less hip arthroscopy appears to be cost-related, with commercially available post-less hip distraction operating room tables costing significantly more than perineal post hip distraction options. However, multiple low-cost options exist for surgeons performing these surgeries in a

variety of surgical environments with the use of standard operating room tables, from yoga mats, seatbelt use on the non-operative leg, and egg-crate foam.<sup>23</sup>

### Conclusion

The use of post-less hip arthroscopy has demonstrated great potential for eliminating untoward complications associated with the perineal post. The utility of this technique allows for a reproducible procedure that provides adequate hip joint distraction, shorter operative time, less risk of neurovascular compromise, and quicker time to discharge.<sup>22</sup> Although post-less hip arthroscopy is in its relative infancy, the current literature as previously discussed demonstrated it to be a viable option for

surgeons performing hip arthroscopy on a regular basis. Of importance, the procedure can be performed in either the supine or lateral position, thus appealing to all surgical preferences. Further research is needed with prospective, long-term data investigating the use of post-less hip arthroscopy and how it compares to the conventional techniques. Safe and adequate joint distraction is a basic fundamental to hip arthroscopy. The recognition of the potential drawbacks of traditional post-based hip arthroscopy has led to the relatively quick pivot to post-less hip arthroscopy. The long-term data collection on comparable risks, benefits, and alternatives will help shape the coming decades of hip arthroscopy.

References:

1. Salas AP, Mendez-Perez E, Mazek J, Velasco-Vazquez H, Castillo-Trevizo A. The Yoga Mat Technique in Postless Hip Arthroscopy. *Arthrosc Tech*. 2021;10(6):e1525-e1530.
2. Shukla S, Pettit M, Kumar KHS, Khanduja V. History of hip arthroscopy. *Journal of Arthroscopic Surgery and Sports Medicine*. 2020;1(73):73-80.
3. Meek WM, Abraham PF, Kucharik MP, Martin SD. Limitations of Postless Hip Arthroscopy for a Patient with Coxa Profunda: A Case Report. *JBJS Case Connect*. 2021;11(1). doi:10.2106/JBJS.CC.20.00347
4. Sing DC, Feeley BT, Tay B, Vail TP, Zhang AL. Age-Related Trends in Hip Arthroscopy: A Large Cross-Sectional Analysis. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*. 2015;31(12):2307-2313.e2. doi:10.1016/j.arthro.2015.06.008
5. Glick JM, Sampson TG, Gordon RB, Behr JT, Schmidt E. Hip arthroscopy by the lateral approach. *Arthroscopy*. 1987;3(1):4-12.
6. Byrd JWT, Thomas Byrd JW. Hip arthroscopy utilizing the supine position. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*. 1994;10(3):275-280. doi:10.1016/s0749-8063(05)80111-2
7. Domb B, Hanypsiak B, Botser I. Labral penetration rate in a consecutive series of 300 hip arthroscopies. *Am J Sports Med*. 2012;40(4):864-869.
8. Telleria JJM, Safran MR, Harris AHS, Gardi JN, Glick JM. Risk of sciatic nerve traction injury during hip arthroscopy— is it the amount or duration? An intraoperative nerve monitoring study. *J Bone Joint Surg Am*. 2012;94(22):2025-2032.
9. Mei-Dan O, Kraeutler MJ, Garabekyan T, Goodrich JA, Young DA. Hip Distraction Without a Perineal Post: A Prospective Study of 1000 Hip Arthroscopy Cases. *Am J Sports Med*. 2018;46(3):632-641.
10. Gedouin JE, May O, Bonin N, et al. Assessment of arthroscopic management of femoroacetabular impingement. A prospective multicenter study. *Orthop Traumatol Surg Res*. 2010;96(8 Suppl):S59-S67.
11. Kocher MS, Kim YJ, Millis MB, et al. Hip Arthroscopy in Children and Adolescents. *Journal of Pediatric Orthopaedics*. 2005;25(5):680-686. doi:10.1097/01.bpo.0000161836.59194.90
12. Nwachukwu BU, McFeely ED, Nasreddine AY, Krcik JA, Frank J, Kocher MS. Complications of Hip Arthroscopy in Children and Adolescents. *Journal of Pediatric*

- Orthopaedics.* 2011;31(3):227-231. doi:10.1097/bpo.0b013e31820cad5
13. Park MS, Yoon SJ, Kim YJ, Chung WC. Hip Arthroscopy for Femoroacetabular Impingement: The Changing Nature and Severity of Associated Complications Over Time. *Arthroscopy: The Journal of Arthroscopic & Related Surgery.* 2014;30(8):957-963. doi:10.1016/j.arthro.2014.03.017
  14. Gupta A, Redmond JM, Hammarstedt JE, Schwindel L, Domb BG. Safety measures in hip arthroscopy and their efficacy in minimizing complications: a systematic review of the evidence. *Arthroscopy.* 2014;30(10):1342-1348.
  15. Flecher X, Dumas J, Argenson JN. Is a hip distractor useful in the arthroscopic treatment of femoroacetabular impingement? *Orthop Traumatol Surg Res.* 2011;97(4):381-388.
  16. Merrell G, Medvecky M, Daigneault J, Jokl P. Hip arthroscopy without a perineal post: a safer technique for hip distraction. *Arthroscopy.* 2007; 23(1): 107.e1-e3.
  17. Mei-Dan O, McConkey MO, Young DA. Hip arthroscopy distraction without the use of a perineal post: prospective study. *Orthopaedics.* 2013;36(1):e1-e5.
  18. Suarez-Ahedo C, Olivos-Meza A, Lodhia P. Postless Hip Arthroscopy Using Standard Maquet Fracture Table With a Pink Hip Kit Positioning Device. *Techniques in Orthopaedics.* 2021;36(4):441.
  19. Kollmorgen RC, Ellis T, Lewis BD, Harris JD. Achieving Post-Free Distraction in Hip Arthroscopy With a Pink Pad Patient Positioning Device Using Standard Hip Distraction Tables. *Arthrosc Tech.* 2019;8(4):e363-e368.
  20. Perry AK, Gursoy S, Singh H, Vadhera AS, Mehta N, Chahla J. The Pink Pad: A Method of Post-Free Distraction During Hip Arthroscopy. *Arthrosc Tech.* 2021;10(8):e1897-e1902.
  21. Welton KL, Garabekyan T, Kraeutler MJ, et al. Effects of Hip Arthroscopy Without a Perineal Post on Venous Blood Flow, Muscle Damage, Peripheral Nerve Conduction, and Perineal Injury: A Prospective Study. *Am J Sports Med.* 2019;47(8):1931-1938.
  22. Schaver AL, Mattingly N, Glass NA, Willey MC, Westermann RW. Hip Arthroscopy With and Without A Perineal Post: A Comparison of Early Postoperative Pain. *Arthroscopy.* 2021; 37(9): 2840-2845.
  23. Jimenez ML, Haneda M, Pascual-Garrido C. The Hip Arthroscopy Post-less Procedure Impingement (HAPPI) Technique: Achieving Distraction With Standard Hip Tables at Zero Additional Cost. *Arthrosc Tech.* 2020;9(11):e1697-e1701.