

Current Trends in the Use of Postless Hip Arthroscopy

A Survey of the International Society for Hip Arthroscopy Membership

Matthew J. Kraeutler,^{*†} MD, Sydney M. Fasulo,[‡] MD, Joshua D. Harris,[†] MD, Omer Mei-Dan,[§] MD, and Anthony J. Scillia,^{‡||} MD

Investigation performed at St. Joseph's University Medical Center, Paterson, New Jersey, USA

Background: Previous studies have demonstrated the risks of pudendal nerve and/or soft tissue complications due to the use of a perineal post during hip arthroscopy. Recently, various postless hip arthroscopy techniques have been described in the literature.

Purpose: To assess the current international trends in the use of postless hip arthroscopy among hip preservation specialists.

Study Design: Cross-sectional study.

Methods: An anonymous 11-item survey was sent by email to all members of the International Society for Hip Arthroscopy (ISHA) in January 2022. Surgeons were asked various questions regarding their current use of post-assisted or postless hip arthroscopy, if they had changed their setup technique during their career and the reason for that change, and their perceived rate of pudendal nerve and/or perineal soft tissue injuries using their current technique. Descriptive statistics were used to report the results of each question. The Student *t* test was used to compare the number of years in practice between post-assisted and postless users. Fisher exact tests were performed to compare categorical rates of pudendal nerve and soft tissue complications between post-assisted and postless users.

Results: A total of 126 surveys were completed from 431 ISHA members (29.2%). Sixty-one percent of the surgeons currently use a perineal post, while 33% use a postless technique. Seventy-five percent of the perineal post users and 98% of the postless users self-reported a rate of pudendal nerve and/or soft tissue injury of <1% ($P = .015$). Among 41 respondents who indicated changing their technique at some point, 59% reported doing so because of pudendal nerve and/or soft tissue complications. Among surgeons who switched from a perineal post to a postless setup, 71% indicated they have noticed a decrease in the rate of pudendal nerve and/or soft tissue complications.

Conclusion: Although use of a perineal post is still a more common setup technique among hip arthroscopists, approximately one-third of surgeons use a postless technique. Surgeons who have switched to a postless technique often did so because of perineal complications, with the majority noticing a subjective decrease in these complications with the use of postless hip arthroscopy.

Keywords: hip arthroscopy; complications; perineal post; postless hip arthroscopy; pudendal nerve

As the incidence of hip arthroscopy has rapidly increased in recent years,²³ so too have the techniques involved with hip arthroscopy, including patient positioning and setup.⁴ Traditionally, hip arthroscopy has been performed with a perineal post since described by Byrd in 1994.² This allows the surgeon to maintain hip distraction while a traction force is pulled on the operative lower extremity. However, multiple studies have demonstrated the risks of pudendal nerve and/or soft tissue complications due to the use of a perineal post.^{3,5,7,22} In a recent systematic review,

Wininger et al²² found a 7.1% incidence of post-related complications reported in prospective studies, including perineal soft tissue injury and pudendal neurapraxia.

In recent years, surgeons have developed a variety of novel patient positioning and/or setup techniques to avoid the use of a perineal post during hip arthroscopy.⁴ These include use of a specialized hip distraction table with the patient in the Trendelenburg position,^{11,20} the yoga mat technique,¹⁷ the Tutankhamun technique,¹⁶ the Beanbag technique,¹³ and the hip arthroscopy postless procedure impingement technique.⁸ Although a multitude of postless techniques have recently been published, it is unclear what proportion of hip arthroscopy surgeons are currently performing postless hip arthroscopy, which specific postless

The Orthopaedic Journal of Sports Medicine, 10(12), 23259671221143353

DOI: 10.1177/23259671221143353

© The Author(s) 2022

This open-access article is published and distributed under the Creative Commons Attribution - NonCommercial - No Derivatives License (<https://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits the noncommercial use, distribution, and reproduction of the article in any medium, provided the original author and source are credited. You may not alter, transform, or build upon this article without the permission of the Author(s). For article reuse guidelines, please visit SAGE's website at <http://www.sagepub.com/journals-permissions>.

techniques are being used most commonly, and the perceived rate of perineal complications based on the various setup techniques used today. The purpose of this study was to assess the current international trends in the use of postless hip arthroscopy among hip preservation specialists. The authors hypothesized that a large proportion of the International Society for Hip Arthroscopy (ISHA) membership currently uses postless hip arthroscopy because of previous issues with pudendal neuropathia.

METHODS

After institutional review board approval (PR#22-003), an anonymous 11-item survey (Table 1) was sent by email to all members of ISHA in January 2022. A reminder email was sent approximately 2 weeks later to facilitate response. Surgeons were asked various questions regarding their current use of post or postless hip arthroscopy, if they had changed their setup technique at some point during their career and the reason for a change, and their perceived rate of pudendal nerve and/or soft tissue injuries using their current technique.

Statistical Analysis

Descriptive statistics were used to report the results of each question. The Student *t* test was used to compare the number of years in practice between post-assisted and postless users. Fisher exact tests were performed to compare categorical rates of pudendal nerve/soft tissue complications between post-assisted and postless users. Statistical analysis was performed using SPSS (Version 22; IBM). $P < .05$ was considered statistically significant.

RESULTS

A total of 126 surveys were completed from 431 active ISHA members (29.2%). The gross results of the survey questions are shown in Table 2. Respondents reported being in practice for a mean of 14.2 years (range, 1-40 years), with no significant difference between post-assisted (mean, 15.1 years) and postless (mean, 12.9 years) users ($P = .19$). The majority of respondents (29%) reported a yearly hip arthroscopy caseload of 101-200 cases.

Sixty-one percent of the surgeons currently use a perineal post, while 33% use a postless technique and 6% use either technique depending on the location at which they are operating. Seventy-five percent of the perineal post users and 98% of the postless users self-reported a rate of pudendal nerve and/or soft tissue injury of <1% (Table 3), with a statistically significant difference in the distribution between the 2 groups ($P = .015$). One post user reported a >20% incidence of perineal complications, and another post user reported an incidence between 11% and 20%.

Of the 41 respondents who indicated changing their technique at some point, 24 (59%) reported doing so as a result of perineal nerve and/or soft tissue complications (Table 2). For those surgeons who switched from a perineal post to a postless setup, the majority (46%) indicated that it took 2 to 5 procedures to feel comfortable with the postless system. Among surgeons who switched from a perineal post to a postless setup, 71% indicated they have noticed a decrease in the rate of perineal nerve and/or soft tissue complications. One surgeon noted initially changing from post-assisted to postless and then back to post-assisted, mentioning that postless is "most helpful for surgeons with long surgical times." Overall, 9% of respondents have encountered permanent pudendal nerve palsy resulting from hip arthroscopy with the use of a perineal post, with 2% of surgeons previously being involved in litigation for such nerve and/or soft tissue complications.

DISCUSSION

Based on the results of this study, a perineal post during hip arthroscopy remains the most common technique used by hip preservation specialists. However, many surgeons (33%) have switched to a postless setup, most often to avoid pudendal nerve and/or perineal soft tissue complications. Of those who have made the change to a postless technique, the majority (68%) have noticed a subjective decrease in perineal complications among their patients.

Interestingly, the vast majority (83%) of all respondents to our survey reported a perceived incidence of pudendal nerve and/or perineal soft tissue complications of <1% among their patients. Even among perineal post users, 75% reported a rate of perineal complications of <1%. Previous studies have reported rates of perineal and groin

*Address correspondence to Matthew J. Kraeutler, MD, Department of Orthopedics & Sports Medicine, Houston Methodist Hospital, 6445 Main St, Suite 2300, Houston, TX 77030, USA (email: matthewkraeutlermd@gmail.com).

†Department of Orthopedics & Sports Medicine, Houston Methodist Hospital, Houston, Texas, USA.

‡Department of Orthopaedic Surgery, St. Joseph's University Medical Center, Paterson, New Jersey, USA.

§Department of Orthopedics, University of Colorado School of Medicine, Aurora, Colorado, USA.

||Academy Orthopaedics, Wayne, New Jersey, USA.

Final revision submitted August 31, 2022; accepted September 26, 2022.

One or more of the authors has declared the following potential conflict of interest or source of funding: J.D.H. has received research support from DePuy Synthes and Smith & Nephew; publishing royalties from SLACK Incorporated and Thieme Medical Publishers; consulting fees from Smith & Nephew; and speaking fees from Xodus Medical; he holds stock or stock options in PatientPop. O.M.D. has received royalties from Stryker and holds stock or stock options in HeapSi and MITA. A.J.S. has received research support from Isto Biologics; and consulting fees from Mitek, Medical Device Business Services, DePuy Synthes, and DePuy Orthopaedics; he holds stock or stock options in Biomet, CONMED Linvatec, Johnson & Johnson, Pfizer, Smith & Nephew, and Stryker.

AOSSM checks author disclosures against the Open Payments Database (OPD). AOSSM has not conducted an independent investigation on the OPD and disclaims any liability or responsibility relating thereto.

Ethical approval for this study was obtained from St. Joseph's Health (PR#22-003).

TABLE 1
A Survey on the Use of Post Versus Postless Hip Arthroscopy^a

-
1. How many years have you been in practice? ____
 2. Approximately how many hip arthroscopy procedures do you perform per year?
 - a. 1-10
 - b. 11-50
 - c. 51-100
 - d. 101-200
 - e. >200
 3. Do you currently use a perineal post or a postless technique?
 - a. Perineal post
 - b. Postless
 - c. Either depending on the site at which I'm operating
 4. Using your current hip arthroscopy technique, approximately how often do you see postoperative perineal nerve and/or soft tissue complications in your patients?
 - a. <1%
 - b. 1-5%
 - c. 6-10%
 - d. 11-20%
 - e. >20%
 5. Since entering practice, did you ever change your hip arthroscopy technique?
 - a. Switched from post to postless
 - b. Switched from postless to post
 - c. I have not changed my technique
 6. If you switched your technique at some point, was it due to perineal nerve and/or soft tissue complications?
 - a. Yes
 - b. No
 - c. I have not changed my technique
 7. If you switched from post to postless, have you noticed a change in the rate of postoperative perineal nerve and/or soft tissue complications in your patients?
 - a. I have noticed an increase in the rate of these complications
 - b. I have noticed a decrease in the rate of these complications
 - c. I have not noticed any change in the rate of these complications
 - d. I have not changed my technique
 8. If you switched from post to postless, approximately how many procedures did it take for you to feel comfortable with the postless technique?
 - a. 1
 - b. 2-5
 - c. 6-10
 - d. 11-20
 - e. >20
 9. Have you ever been involved in litigation as a result of perineal nerve and/or soft tissue complications after hip arthroscopy?
 - a. Yes
 - b. No
 10. Have you ever seen permanent pudendal nerve palsy as a result of hip arthroscopy with a perineal post?
 - a. Yes
 - b. No
 11. (Optional) Please use this space to leave any additional comments that you would like.
-

^aThe online survey tool of the International Society for Hip Arthroscopy (ISHA) was used to capture each surgeon's responses and export the data into a Microsoft Excel document. Surgeon names were reviewed by ISHA before anonymizing the results to ensure that no surgeon completed the survey more than once. Survey results were then compiled and analyzed.

numbness as high as 41% to 59% while using a perineal post in hip arthroscopy.^{5,10,15} In a systematic review of 24 studies, Habib et al⁷ reported a 1.8% rate of pudendal nerve injury. However, this likely represents an underreporting, as Wininger et al²² recently found that post-related complications are reported at a 5 times higher rate in prospective (7.1%) versus retrospective (1.4%) ($P < .001$) studies. The large discrepancy in self-reported groin-related complication rates is probably multifactorial, but some potential reasons are that patients are often hesitant to report symptoms of pudendal neurapraxia unless specifically asked,

surgeons are often reluctant to probe patients on such issues, and many times the attending surgeon does not personally question/examine patients at the initial postoperative appointment when pudendal neurapraxia may still be present. Furthermore, the low rate of subjective reporting of complications by the surgeons in the current study may be partly due to the vague nature of the survey question, which did not clarify whether transient complications such as pudendal neurapraxia should be included.

We found that 33% of the ISHA surgeons currently use postless hip arthroscopy exclusively, with another 6%

TABLE 2
Gross Results of Survey Responses^a

Variable	n (%)
Years in practice ^b	14.2 (8.6)
Hip arthroscopy procedures performed per year	
1-10	3 (2)
11-50	27 (21)
51-100	30 (24)
101-200	36 (29)
>200	30 (24)
Do you currently use a perineal post or a postless technique?	
Perineal Post	77 (61)
Postless	42 (33)
Either depending on the site at which I'm operating	7 (6)
Using your <u>current</u> hip arthroscopy technique, approximately how often do you see postoperative perineal nerve and/or soft tissue complications in your patients?	104 (83)
<1%	18 (14)
1-5%	2 (2)
6-10%	1 (<1)
11-20%	1 (<1)
>20%	
Since entering practice, did you ever change your hip arthroscopy technique?	
Switched from post to postless	41 (33)
Switched from postless to post	1 (<1)
I have not changed my technique	84 (67)
If you switched your technique at some point, was it due to perineal nerve and/or soft tissue complications?	
Yes	24 (19)
No	22 (17)
I have not changed my technique	80 (63)
If you switched from post to postless, have you noticed a change in the rate of postoperative perineal nerve and/or soft tissue complications in your patients?	1 (<1)
I have noticed an increase in the rate of these complications	33 (26)
I have noticed a decrease in the rate of these complications	12 (10)
I have not noticed any change in the rate of these complications	80 (63)
I have not changed my technique	
If you switched from post to postless, approximately how many procedures did it take for you to feel comfortable with the postless technique? ^c	5 (12)
1	19 (46)
2-5	12 (29)
6-10	3 (7)
11-20	2 (5)
>20	
Have you ever been involved in litigation as a result of perineal nerve and/or soft tissue complications after hip arthroscopy?	
Yes	3 (2)
No	123 (98)
Have you ever seen <u>permanent</u> pudendal nerve palsy as a result of hip arthroscopy with a perineal post?	
Yes	11 (9)
No	115 (91)

^aN = 126 except where indicated.

^bData are given as mean (SD).

^cN = 41, representing respondents who indicated they switched from post to postless.

sometimes using a postless setup depending on the location at which they are operating. The concept of postless hip arthroscopy is relatively new. Although previous studies in 2007¹³ and 2013¹² described postless techniques, commercially available postless distraction systems did not become available until 2018. Thus, there has been a rapid adoption of postless hip arthroscopy, as a result of not only the lack of groin-related complications mentioned above but

also other benefits, such as shorter traction/operating room time (likely due to easier mobilization of the hip during cam resection) and shorter time to discharge from the postanesthesia care unit.¹⁸ A recent study by Kraeutler et al⁹ prospectively compared groin-related complications between patients undergoing hip arthroscopy by the same surgeon with versus without a perineal post. The authors found a significantly lower rate of postoperative groin

TABLE 3

Estimated Prevalence of Pudendal Nerve and/or Soft Tissue Complications in Perineal Post and Postless Users^a

	Postless (n = 42)	Perineal Post (n = 77)
Perineal nerve and/or soft tissue complications, %		
<1	41 (98)	58 (75)
1-5	1 (2)	15 (19)
6-10	0 (0)	2 (3)
11-20	0 (0)	1 (1)
>20	0 (0)	1 (1)

^aData are given as n (%). A statistically significant difference was found in the distribution of the 2 groups ($P = .015$).

numbness (0% vs 30%, $P < .0001$) and foot numbness (12% vs 32%, $P = .04$) in the postless group. In addition, 3 cases of temporary sexual dysfunction occurred in male patients undergoing hip arthroscopy with a perineal post versus none in the postless group. Despite the relative novelty of most postless techniques, 3 surgeon respondents to our survey mentioned that the use of a perineal post is outdated and that the “future is postless.”

The learning curve for surgeons performing hip arthroscopy has been previously studied, with a recent systematic review demonstrating a wide range of cutoff numbers proposed to achieve proficiency ranging from 20 to 519 cases.⁶ As surgeons gain more experience, the average operative time and traction time decrease.⁶ Other studies have shown a correlation between longer traction time and pudendal neurapraxia.^{1,7} Thus, for new surgeons with potentially longer traction times, pudendal neurapraxia is of particular concern, and the use of postless hip arthroscopy can diminish this concern and allow surgeons to focus on the case at hand rather than minimizing traction time. In our study, 1 surgeon noted initially changing from post-assisted to postless and then back to post-assisted, mentioning that postless is “most helpful for surgeons with long surgical times.” However, even for experienced surgeons, longer traction times may be encountered with advanced central compartment procedures such as revision hip arthroscopy, labral augmentation/reconstruction, ligamentum teres surgery, and articular cartilage restoration, among others. For surgeons at teaching institutions, traction time with a postless technique may be less stressful while trainees (eg, residents, fellows, visiting board-eligible or board-certified surgeons) are learning hip arthroscopy. For established surgeons, our survey demonstrates that the learning curve when transitioning from a post to postless technique appears to be low, with most surgeons indicating it took only 2 to 5 procedures to feel comfortable with the new technique.

Two reasons cited by the survey respondents for not using a postless technique included lateral positioning and cost. Five surgeons reported that they use a perineal post with the patient in the lateral position because postless hip arthroscopy “is not an option” with lateral positioning. Although originally

designed for supine positioning, the commercially available postless distraction system may also be used in the lateral position. The use of this device in the lateral position was originally validated in a cadaver laboratory setting and later adopted by numerous high-volume hip preservation surgeons worldwide. With regard to cost, 1 surgeon respondent to our survey noted that they are considering switching to a postless technique because of the ease of cam resection, although the cost of the specialized distraction table is potentially restrictive. However, a recent systematic review found that multiple low-cost, semireproducible techniques exist for postless patient positioning without using a specifically designed, researched, and tested surgical bed and setup.^{4,8,13,16,17} There are potential disadvantages of postless hip arthroscopy techniques that place the patient in the Trendelenburg position, such as the potential for abdominal fluid extravasation. However, the use of commercially available products in conjunction with these techniques allows for increased friction between the patient and the operating table, such that Trendelenburg positioning can be minimized and in some cases eliminated.

The limitations of this study should be noted. First, the low response rate (29.2%) from ISHA members indicates that our findings may not reflect the current trends of all hip arthroscopists. However, this response rate is similar to other survey-type studies of society memberships.^{14,19,21} Recall bias may have played a role in survey responses especially with regard to each surgeon’s perceived rate of perineal complications and the learning curve of the postless technique. In addition, the reported rates of groin-related complications may be underreported because of the wording of the survey questions, as transient complications (eg, pudendal neurapraxia) were not explicitly included in the question stem. The results are subject to response bias, particularly from surgeons who continue to use a perineal post. Surgeon responses were not validated for accuracy with regard to number of years of experience, annual case volume, and actual groin-related complication rate. We did not analyze or compare surgeon characteristics such as age, sex, or fellowship training. We also did not analyze geographic distribution of post versus postless use.

CONCLUSION

Although the use of a perineal post is still a more common setup technique among hip arthroscopists, approximately one-third of surgeons use a postless technique. Surgeons who have switched to a postless technique often did so because of perineal complications, with the majority noticing a subjective decrease in these complications with the use of postless hip arthroscopy.

REFERENCES

1. Bailey TL, Stephens AR, Adeyemi TF, et al. Traction time, force and postoperative nerve block significantly influence the development and duration of neuropathy following hip arthroscopy. *Arthroscopy*. 2019; 35(10):2825-2831.
2. Byrd JW. Hip arthroscopy utilizing the supine position. *Arthroscopy*. 1994;10(3):275-280.

3. Clarke MT, Arora A, Villar RN. Hip arthroscopy: complications in 1054 cases. *Clin Orthop Relat Res*. 2003;406:84-88.
4. Decilveo AP, Kraeutler MJ, Dhillon J, et al. Postless arthroscopic hip preservation can be adequately performed using published techniques. *Arthrosc Sports Med Rehabil*. 2022. In press.
5. Dippmann C, Thorborg K, Kraemer O, Winge S, Hölmich P. Symptoms of nerve dysfunction after hip arthroscopy: an under-reported complication? *Arthroscopy*. 2014;30(2):202-207.
6. Go CC, Kyin C, Maldonado DR, Domb BG. Surgeon experience in hip arthroscopy affects surgical time, complication rate, and reoperation rate: a systematic review on the learning curve. *Arthroscopy*. 2020;36(12):3092-3105.
7. Habib A, Haldane CE, Ekhtiari S, et al. Pudendal nerve injury is a relatively common but transient complication of hip arthroscopy. *Knee Surg Sports Traumatol Arthrosc*. 2018;26(3):969-975.
8. 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.
9. Kraeutler MJ, Fasulo SM, Dávila Castrodad IM, Mei-Dan O, Scillia AJ. A prospective comparison of groin-related complications after hip arthroscopy with and without a perineal post. *Am J Sports Med*. Published online November 7, 2022. doi:10.1177/03635465221130768
10. Mas Martinez J, Sanz-Reig J, Morales Santias M, Martínez Gimenez E, Bustamante Suarez de Puga D, Verdu Román C. Femoroacetabular impingement: prospective study of rate and factors related for nerve injury after hip arthroscopy. *J Orthop*. 2019;16(5):350-353.
11. 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.
12. Mei-Dan O, McConkey MO, Young DA. Hip arthroscopy distraction without the use of a perineal post: prospective study. *Orthopedics*. 2013;36(1):e1-e5.
13. 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.
14. Provencher MT, Frank RM, Scuderi MG, et al. General and disease-specific use of outcomes scores for the shoulder: a survey of AOSSM, AANA, and ISAKOS members. *Phys Sportsmed*. 2014;42(3):120-130.
15. Reda B, Wong I. Postoperative numbness: a survey of patients after hip arthroscopic surgery. *Orthop J Sports Med*. 2018;6(5):2325967118771535.
16. Salas AP, Mazek J, Araujo-Reyes D, Gonzalez-Campos M, Castillo-Trevizo A, Garcia JM. The Tutankhamun technique in hip arthroscopy. *Arthrosc Tech*. 2018;7(11):e1167-e1171.
17. 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.
18. 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.
19. Schumaier A, Minoughan C, Jimenez A, Grawe B. Treatments of choice for isolated, full-thickness tears of the posterior cruciate ligament: a nationwide survey of orthopaedic surgeons. *J Knee Surg*. 2019;32(8):812-819.
20. 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.
21. Welton KL, Kraeutler MJ, McCarty EC, Vidal AF, Bravman JT. Current pain prescribing habits for common shoulder operations: a survey of the American Shoulder and Elbow Surgeons membership. *J Shoulder Elbow Surg*. 2018;27(6 S):S76-S81.
22. Wininger AE, Mei-Dan O, Ellis TJ, et al. Post-related complications in hip arthroscopy are reported significantly higher in prospective versus retrospective literature—a systematic review. *Arthroscopy*. 2022;38(5):1658-1663.
23. Zusmanovich M, Haselman W, Serrano B, Banffy M. The incidence of hip arthroscopy in patients with femoroacetabular impingement syndrome and labral pathology increased by 85% between 2011 and 2018 in the United States. *Arthroscopy*. 2022;38(1):82-87.