Can Hip Arthroscopy Be Performed With Conventional Knee-Length Instrumentation?

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Purpose: The purpose of this study was to determine whether hip arthroscopy can be performed using conventional knee-length arthroscopy instrumentation. **Methods:** We included 116 consecutive hip arthroscopies (104 patients) in this study. Age, side of surgery, height (in inches), weight (in pounds), body mass index (BMI), and a subjective assessment of body type (1, muscular; 2, somewhat overweight; 3, overweight; 4, thin; and 5, normal weight) were recorded. The depth from the skin at 2 portal sites to 3 commonly accessed positions (12 o'clock, 3 o'clock, and acetabular fossa) was assessed using a guide with marked notches (in millimeters). Subgroup analysis was performed according to BMI and subjective biotype for each patient. **Results:** We included 104 patients with a mean age of 35 years (range, 14 to 55 years). As categorized by BMI, 60% of patients were normal weight, 22% were overweight, 16% were obese, and 2% were underweight. All but 8 procedures were performed with conventional knee-length arthroscopic shavers and burrs. The 8 procedures that needed additional hip instrumentation were performed in patients who required ligamentum teres debridement or those with iliopsoas tenotomy. Overall, the distance from skin to socket was less than 11 cm at the 12-o'clock and 3-o'clock positions from both the anterolateral and anterior portals. Obese and overweight patients had statistically longer distances from skin to socket at all 3 measurement points compared with underweight and normal-weight patients. Considering biotype, the distances from skin to socket in underweight, normal-weight, and muscular patients were all equal to or less than 10 cm. **Conclusions:** The distance from skin to socket at the 12- and 3-o'clock positions is less than 11 cm, suggesting that hip arthroscopy can be performed with conventional knee-length instrumentation devices. In obese and overweight patients and patients requiring ligamentum teres debridement or iliopsoas tendon release, specific hip arthroscopic tools should be available. **Level of Evidence:** Level IV, therapeutic case series.

The number of arthroscopic hip procedures being performed has increased dramatically over the past 10 years. A recent review reported an 18-fold increase in the number of hip arthroscopic procedures reported in the American Board of Orthopaedic Surgery database between 1999 and 2009.[1,2] Since 2003, orthopaedic surgeons completing sports fellowship training have heavily driven the increase in these procedures.[2]

The development of hip-specific arthroscopic technology has coincided with the aforementioned trends. Most manufacturers of arthroscopy instrumentation now supply devices designed specifically for hip procedures, with an increased length compared with existing knee and shoulder instrumentation as their defining difference. Although some variation exists in the precise length of each manufacturer's arthroscopy instrumentation, hip-specific instruments are approximately 19 cm in length compared with a length of 11 to 13 cm for instruments normally used for knee or shoulder arthroscopy. These specifically designed instruments come at a significantly higher cost.[3]

The hip joint is characteristically deeper than the knee and shoulder joints, making arthroscopic access more challenging.[1] Published reports have emphasized the potential advantage of specialized instrumentation because of the nature of the hip joint,[2] such as longer, curved radiofrequency (RF) devices designed to go

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around the femoral head and address ligamentum teres (LT) pathology. Therefore the device industry's effort to create longer instrumentation is not without purpose. However, data to support the need for the additional length, how much additional length is required, and whether this additional length is required in all cases of hip arthroscopy have not been established. The inherent nature of designing procedure-specific instrumentation drives the use of that procedure. Furthermore, training with these instruments during fellowships further substantiates their use, without much question given to their necessity.

The purpose of this study was to determine whether hip arthroscopy can be performed using conventional knee-length arthroscopy instrumentation by assessing the distance from the skin to 3 targeted points in the hip through the 2 primary portals (anterolateral and anterior portals). We hypothesized that, in most patients, the distance from skin to socket would be less than 11 cm and therefore conventional knee instruments could be used in standard hip arthroscopy. Finally, a review of cost differences between standard and hip joint–specific arthroscopy instrumentation was performed.

Methods

Study Population

In 2012 our institution implemented an institutional review board–approved prospective registry dedicated to the tracking of patients who presented to our hip-preservation service and who agreed to be enrolled. Patients are evaluated preoperatively, intraoperatively, and postoperatively. The first 116 consecutive hip arthroscopies performed in 104 patients were included in this study.

Patient Data

The following demographic data were recorded: age, side of surgery, height (in inches), and weight (in pounds). Assessment of body type (1, muscular; 2, somewhat overweight; 3, overweight; 4, thin; and 5, normal weight) was recorded,[4] and body mass index (BMI) was calculated from height and weight. Patients were classified according to their BMI as follows: underweight, less than 18.5 kg/m^2; normal weight, 18.5 to 24.99 kg/m^2; overweight, 25 to 29.99 kg/m^2; or obese, 30 kg/m^2 or greater. The assessment of body type is included as a subjective evaluation because patients undergoing hip arthroscopy are often athletic and carry a higher percentage of fat-free mass.[2,4-6] These muscular patients tend to have a relatively higher BMI because muscle weighs more than fat, but the high BMI is generally not due to subcutaneous adiposity at the surgical site and would not reflect a need for longer instruments.

Our standard hip arthroscopy technique was used and is similar to a technique that has been described previously.[7] In brief, the patient is positioned supine on a traction table with the foot well padded and placed in a traction boot. The patient is placed in a 10° Trendelenburg position, and traction is wound on under fluoroscopic guidance after the suction seal of the hip is broken with a spinal needle. No perineal post is used in the groin. Once adequate traction is achieved, a standard anterolateral portal is made and the arthroscope is introduced into the hip under fluoroscopic guidance. The anterior portal (also known as midanterior portal) is then made under direct vision at a point 3 cm distal to the midpoint between the anterolateral portal and a line drawn down from the anterior superior iliac spine. Our anterolateral portal is placed slightly posterior to that described in the literature. Our standard hip arthroscopic procedures, including anchor placement, can generally be performed through these 2 portals. A pump is used with the pressure kept at or below 30 mm Hg.

To assess the depth of the working space within the hip joint and the equipment needed for each case, the switching stick regularly used during hip arthroscopy was laser marked in centimeter and millimeter increments. This tool allowed for the measurement of the joint-to-skin distance at 3 working positions commonly encountered during hip arthroscopy: 12 o'clock, 3 o'clock (at the capsulolabral junction), and acetabular fossa (at the deepest point that the switching stick could reach). The 12- and 3-o'clock positions were located as previously described.[8,9] The 12-o'clock position was located directly opposite the middle of the transverse acetabular ligament (6-o'clock position). The 3-o'clock position was located by drawing a horizontal line at the top of the acetabular notch.

The depth was measured from the tip of the stick, placed at the stated position in the joint, to the point at which it was flush with the skin (Fig 1). The 3 aforementioned measurements were recorded from each portal while traction was applied, for a total of 6 measurements, during each consecutive hip arthroscopy while the hip was under traction. All measurements were performed at the beginning and end of the operation by the same surgeon (O.M.D.).

Most of the arthroscopy instruments used for the surgical procedures included in this analysis were standard-length instruments (knee or shoulder instruments) measuring 110 to 130 mm in shaft length. The only hip-designated instruments used were a flexible hip-length wand (Sidewinder; ArthroCare, Austin, TX) in cases in which LT pathology had to be addressed and a hip-length 50° wand (Super MultiVac; ArthroCare) in some cases for iliopsoas (IP) release. For the comparative assessment of the standard (knee) and extra-long (hip) instrumentation, the shaft lengths of burrs, shavers, and RF devices from hip and knee instrumentation of 5 different

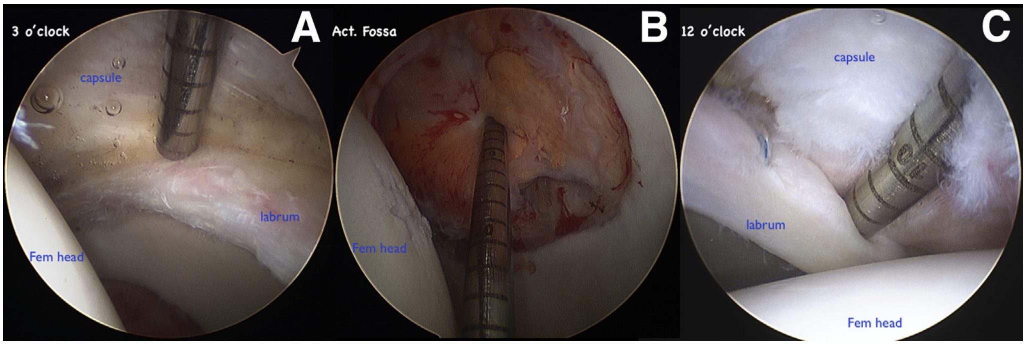

Fig 1. Examples of measurements from study with hip arthroscopic views of measured points. (A) Arthroscopic image of a left hip with camera in anterolateral portal and measurement of 3-o'clock position from anterior portal. (B) Arthroscopic image of a left hip with camera in anterior portal and measurement of acetabular (Act) fossa depth from anterolateral portal. (C) Arthroscopic image of a left hip with camera in anterior portal and measurement of 12-o'clock position from anterolateral portal. (Fem, femoral.)

manufacturers (Stryker [Kalamazoo, MI], Arthrex [Naples, FL], Smith & Nephew [Andover, MA], ArthroCare, and Linvatec [Largo, FL]) were obtained (Fig 2).

The comparative cost (list prices of the 5 aforementioned manufacturers) of instrumentation specifically designed for hip arthroscopy was compared with that of standard-length instrumentation. The average cost across instruments routinely used during arthroscopy was determined. Estimated cost savings across the 116 procedures included in this review and the annual cost implications were calculated.

Statistics

Descriptive statistics were calculated according to standard methods, including frequencies, means, standard deviations, and ranges when appropriate. The difference in measurements among the anterolateral and anterior portals at the 12-o'clock, 3-o'clock, and acetabular fossa positions was calculated using a paired *t* test. Subgroup analysis of the distance from skin to socket among patients with BMI less than 18.5 kg/m^2 (underweight), BMI of 18.5 to 24.99 kg/m^2 (normal weight), BMI of 25 to 29.99 kg/m^2 (overweight), and BMI of 30 kg/m^2 or greater (obese) was performed. Subgroup analysis was also performed using the surgeon's (O.M.D.) assessment of patients' body types. A 1-way analysis of variance with the Tukey post hoc test was performed to determine differences among these subgroups in both the anterior and anterolateral portals. Statistical significance was set at $P < .05$. Statistical analyses were performed using GraphPad software (GraphPad Software, La Jolla, CA).

Results

The study population comprised 104 patients (116 hips) with a mean age of 35 years (range, 14 to 55 years). There were 62 right-sided operations and 54 left-sided operations, and 12 patients underwent arthroscopy of both hips. Table 1 shows patient demographic data and types of operations performed for the cohort study.

The classification and distribution of BMI in the patient population was as follows: 60% were normal weight, 22% were overweight, 16% were obese, and 2% were underweight. An additional body-type

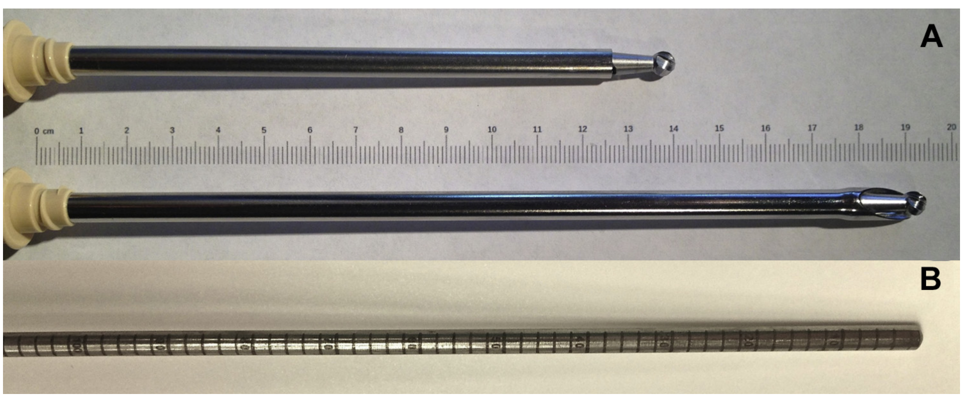

Fig 2. (A) Difference in length of standard arthroscopic burr and hip-specific arthroscopic burr. (B) Switching stick used to measure targeted hip joint points, with laser-etched depth lines.

Table 1. Demographic Data of Patients Included in Cohort Study

Parameter	Data
Age, yr	35 ± 10
BMI, kg/m^2	24.45 ± 5
Laterality	92 unilateral and 12 bilateral
Side	62 right and 54 left
Operation	
FAI treatment with or without labrum repair/reconstruction (cam, pincer, or mixed)	95 (82%)
Dysplastic labrum tear repair before open PAO (with or without cam-type FAI)	12 (10%)
Other (LT reconstruction, chondromatosis, treatment after dislocation, removal of loose bodies)	9 (8%)

NOTE. Data presented as n (%) or mean ± standard deviation unless otherwise indicated.

FAI, femoroacetabular impingement; PAO, periacetabular osteotomy.

classification system was also used.[4] Per this categorization, patients were classified as follows: 45 (43%) were normal weight, 22 (21%) were muscular, 15 (16%) were somewhat overweight, 11 (10%) were thin, and 10 (10%) were overweight. The comparison of these 2 classification systems suggests that some patients presenting as overweight or obese according to their BMI score are actually muscular patients with larger body masses, as is typical for many athletes.

Standard (knee, shoulder)−length arthroscopy shavers and burrs were used in all 116 cases. No case required a longer (hip-length) burr or shaver to complete adequate bony resection of pincer- or cam-type lesions (Fig 3). In 3 of 15 patients (20%) who

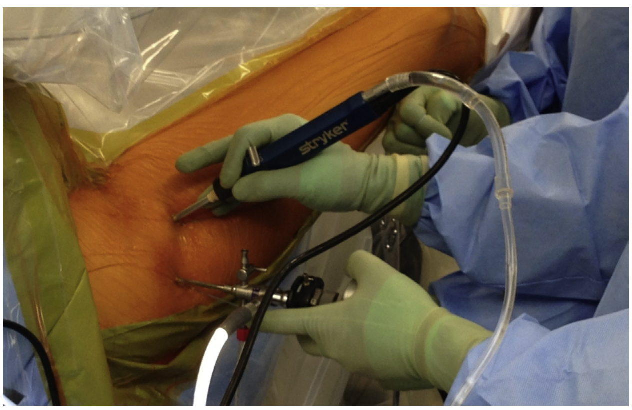

Fig 3. Hip arthroscopy on a right hip using conventional arthroscopic tools. It should noted that the arthroscopic knee-length burr is not introduced all the way into the hip (bottom down) while working at the 3-o'clock position to trim a pincer lesion. The shorter length of the burr enables the surgeon to use the hand against the patient's skin for fine work and increased precision.

Table 2. Overall Measurements Between Skin and 12-O'Clock Position, 3-O'Clock Position, and Acetabular Fossa From Anterior and Anterolateral Portals

Portal	12-O'Clock Position, cm	3-O'Clock Position, cm	Acetabular Fossa, cm
Anterior	10.65 ± 1.3	10.52 ± 1.3	13.78 ± 1.39
Anterolateral	9.87 ± 1.43	11.28 ± 1.44	13.74 ± 1.49
P value	$P < .001$	$P < .001$	$P = .6537$

NOTE. Data presented as mean ± standard deviation unless otherwise indicated. The distance was statistically shorter from the anterolateral portal to the 12-o'clock position and from the anterior portal to the 3-o'clock position. The 12- and 3-o'clock positions could be easily reached from the anterior portal with conventional arthroscopic instruments (≤13 cm).

required IP tendon release performed at the level of the joint, a longer RF device specifically designed for the hip was needed to reach the tendon from the anterior portal. Two of these cases comprised bilateral arthroscopy in a tall (6 ft 4 in) basketball player, with a BMI of 25 kg/m^2 and a muscular body type. In the majority of patients with LT pathology (84%), a flexible, hip-specific RF device was used (32 procedures, 27%). In the other 16% (5 cases), the knee-length wand was sufficient to address the LT pathology.

Measurements through the anterior portal and anterolateral portal were completed in 116 cases at the 12-o'clock, 3-o'clock, and acetabular fossa positions. Measurements at the beginning and end of the operation showed no difference. A statistically significant difference was evident at the 12- and 3-o'clock positions between the anterior and anterolateral portals. The distance from the skin to the 12-o'clock position was statistically shorter from the anterolateral portal (9.87 ± 1.43 cm *v* 10.6 ± 1.3 cm). Conversely, the distance from the skin to the 3-o'clock position was statistically shorter from the anterior portal (10.52 ± 1.3 cm *v* 11.28 ± 1.44 cm). No statistical difference was observed for the acetabular fossa measurements between the 2 portals. Table 2 outlines the average distances at the different positions from both portals.

Subgroup Analysis According to BMI

When we compared the different BMI groups (<18 kg/m^2, 18 to 24.99 kg/m^2, 25 to 29.99 kg/m^2, and ≥30 kg/m^2), the distance from the anterior portal and anterolateral portal between the skin and socket was statistically longer in overweight and obese patients compared with underweight and normal-weight patients at all 3 measurement points (12-o'clock position, 3-o'clock position, and acetabular fossa) (Tables 3 and 4). It should noted that for the 12-o'clock point, the distance in underweight and normal-weight patients was statistically shorter than that in overweight and obese patients. Still, only obese patients had measurements longer than 10 cm, whereas 11 cm is the minimal

Table 3. Measurements From Skin to Each Landmark (12-O'Clock Position, 3-O'Clock Position, and Acetabular Fossa) From Anterior Portal According to BMI

BMI	12-O'Clock Position, cm	3-O'Clock Position, cm	Acetabular Fossa, cm
Underweight	9 ± 0.25*	9.25 ± 0.5*	12 ± 1†
Normal weight	10.1 ± 1*	10 ± 0.9*	13.2 ± 1†
Overweight	11.3 ± 1†	11.25 ± 1.2†	14.64 ± 1†
Obese	12.2 ± 1†	12.02 ± 0.9†	15.32 ± 1†
P value	*P* < .001†	*P* < .001†	*P* < .0001†

NOTE. Data presented as mean ± standard deviation unless otherwise indicated. Analysis-of-variance comparison was performed considering each different location (12-o'clock position, 3-o'clock position, and acetabular fossa) among subgroups.

*Underweight and normal-weight patients showed a distance of 10 cm or less, suggesting that conventional arthroscopic tools could be used to access these areas.

†Overweight and obese patients had statistically longer distances at both the 12- and 3-o'clock positions (>10 cm). The distance to the fovea was statistically longer between subgroups.

shaft length for some standard arthroscopy instrumentation (more common lengths are 12 to 13 cm). From the anterolateral portal, at the 3-o'clock and acetabular fossa positions, all subgroups were statistically different. Only underweight and normal-weight patients had a distance of 10 cm or less to the skin. However, in these 2 subgroups, a hip-designated RF device was still needed to navigate around the femoral head and address the LT pathology. None of the subgroups showed a distance of less than 10 cm from the skin to the acetabular fossa.

Subgroup Analysis According to Body Type

Measurements from the anterior portal to the 12- and 3-o'clock positions in underweight, normal-weight, and muscular patients were all equal to or less than 10 cm.

Table 4. Measurements From Skin to Each Landmark (12-O'Clock Position, 3-O'Clock Position, and Acetabular Fossa) From Anterolateral Portal According to BMI

BMI	12-O'Clock Position, cm	3-O'Clock Position, cm	Acetabular Fossa, cm
Underweight	8.6 ± 1.2*	9.5 ± 0.5*,†	12 ± 0.8†
Normal weight	9.21 ± 1*	10.75 ± 0.8*,†	13 ± 1†
Overweight	10.63 ± 0.9†	11.91 ± 1.17†	14.5 ± 1.6†
Obese	11.31 ± 0.9†	12.5 ± 1.4†	15 ± 1†
P value	*P* < .001†	*P* < .001†	*P* < .001†

NOTE. Data presented as mean ± standard deviation unless otherwise indicated. Analysis-of-variance comparison was performed considering each different location (12-o'clock position, 3-o'clock position, and acetabular fossa) among subgroups.

*In underweight and normal-weight patients, the distances were 10 cm or less, which would explain how conventional arthroscopic tools could be used to work in these areas.

†Overweight and obese patients had statistically longer distances at both the 12- and 3-o'clock positions. The distance to the acetabular fossa was statistically longer between subgroups.

Table 5. Measurement From Anterior Portal to Each Landmark (12-O'Clock Position, 3-O'Clock Position, and Acetabular Fossa) According to Body Type

Body Type	12-O'Clock Position, cm	3-O'Clock Position, cm	Acetabular Fossa, cm
Muscular	10 ± 0.7	10.41 ± 1	13.1 ± 1
Somewhat overweight	11 ± 2*	11.2 ± 3*	14 ± 3
Overweight	12.2 ± 0.7*	12.3 ± 1*	15 ± 1
Thin	9.17 ± 0.5	9.39 ± 0.65	12.14 ± 0.5
Normal weight	10.3 ± 1	10.3 ± 1	13.4 ± 1

NOTE. Data presented as mean ± standard deviation unless otherwise indicated. The distance to the 12- and 3-o'clock positions from the anterior portal in muscular, thin, and normal-weight patients was 10 cm or less. Trying to use only conventional knee-length tools for somewhat overweight and overweight patients would be a challenge, with a distance just under 13 cm.

*Statistically longer distances were seen in somewhat overweight and overweight patients (*P* < .001).

There was no statistical difference among these distances between muscular and normal-weight patients, regardless of their BMI. Muscular patients had a higher BMI than normal-weight patients (24 ± 2 kg/m^2 *v* 22 ± 2 kg/m^2) (Table 5).

From the anterolateral portal, the distance to the 12-o'clock position was 10 cm or less in muscular, normal-weight, and thin patients. In contrast, the distance to the 3-o'clock position was less than 10 cm only in thin patients. At the 3-o'clock position, normal-weight and muscular patients showed similar skin-to-socket distances (Table 6).

Discussion

This study found that BMI significantly affected measurements from the skin to the landmarks, but only in patients who are obese would there potentially be a need for longer instruments. In addition, in this cohort of 116 hips, the total amount that was saved using conventional knee arthroscopy instruments was US

Table 6. Measurements From Anterolateral Portal to Each Landmark (12-O'Clock Position, 3-O'Clock Position, and Acetabular Fossa) According to Body Type

Body Type	12-O'Clock Position, cm	3-O'Clock Position, cm	Acetabular Fossa, cm
Muscular	9.6 ± 1*	11 ± 1*	13 ± 1
Somewhat overweight	10.8 ± 2*	12 ± 3*	14 ± 3
Overweight	11.8 ± 1.5*	13 ± 1.2*	15 ± 1.5
Thin	8.3 ± 0.76*	9.65 ± 0.8*	11.9 ± 0.7
Normal weight	9.5 ± 0.9*	11.5 ± 1.2	13.14 ± 0.8

NOTE. Data presented as mean ± standard deviation unless otherwise indicated. From the anterolateral portal, access with conventional arthroscopic tools to the 12-o'clock position could be achieved in all patients, with muscular, thin, and normal-weight patients showing distances of 10 cm or less. In contrast, the 3-o'clock position was only easily accessible with conventional knee arthroscopy tools in thin patients.

**P* < .001.

$41,992, which reflects a hypothetical annual savings of US $108,600 based on the estimate of performing 300 hip arthroscopies per year.

The optimal shaft length for knee and shoulder arthroscopy instrumentation is defined as 10 to 13 cm, although many manufacturers make the instruments longer.[1] No difference was found in the measurements performed before and at the end of the operation. The low pressure at which the hip arthroscopies were performed in this study may explain these findings. Currently, no standards have been defined for the optimal length of hip arthroscopy instruments, despite the device manufacturing industry's promotion of hip-length, or extra-long, arthroscopy instrumentation. In our cohort, knee- or shoulder-length arthroscopic instruments were successfully used in almost all procedures across a heterogeneous population. Very few specific procedures, such as LT partial tears treated with stabilization or debridement, required the use of an additional hip-designated device. The need for a hip-designated device when addressing the LT pathology occurred not only because of the longer distance from the skin to the fossa but also because of the need to navigate around the femoral head, making this portion of the operation impossible with conventional arthroscopy instruments. In addition, when one is performing IP tendon release in tall or obese patients, use of hip devices should be considered. The IP tendon is located further anteriorly in relation to the common portal used, requiring a curved and long device to reach it for treatment.

Overall, the distance from skin to socket at both the 12- and 3-o'clock positions (from both the anterior and anterolateral portals) was less than or equal to 11 cm. The distance to the acetabular fossa was used as the deepest point in the joint, measuring more than 13 cm in some cases. However, in this area, as described, only a flexible RF device will work.

A difference in skin-to-joint distance was observed in relation to patients' BMIs. Overweight and obese patients showed statistically longer distances compared with underweight and normal-weight patients (with a distance >11 cm at all 3 targeted points). We suggest that additional hip arthroscopy instrumentation be available in the room for these patients because, occasionally, the working length with these devices made the procedure more challenging.

When we considered patients' biotype, muscular, normal-weight, and underweight patients did not show a statistical difference in the measured distances. These 3 subgroups had a skin-to-joint distance of less than 11 cm, suggesting that hip arthroscopy can be completed with conventional instrumentation. Interestingly, we found that muscular patients had a higher BMI compared with normal-weight patients; however, the measured distances remained similar. This is compatible with the data presented by Lambert et al.[5] that evaluated the relation between BMI and percentage of fat in collegiate athletes. They concluded that in this athletic population, although the athletes presented with higher BMIs, they had a higher percentage of fat-free mass, suggesting that BMI alone cannot solely define overweight and obese classifications.[5]

Table 7. Cost Analysis per Device (Conventional Knee *v* Hip Specific) of Same Manufacturer, Averaged Among 5 Different Brands

Tool	Conventional Knee (US $)	Hip Specific (US $)
Burr	230	292
Shaver	202	261
RF	358	599
Total	790	1,152

NOTE. List prices are shown, and these may differ significantly from negotiated contractual prices.

The senior surgeon (O.M.D.) suggests that an advantage when using conventional instrumentation in hip arthroscopy is that it enables the surgeon, holding the burr handpiece closer to the skin, to lay his or her fingers on the skin. The ability to support the hand and instrument on the patient's body may allow finer control of hand movements during the procedure (Fig 3).

The cost analysis of the instrumentation in this study comprised a cost comparison of the standard versus hip instruments for the same device from the same manufacturer. Cost differences for each item from the 5 different manufacturers were averaged (Table 7). Using standard-length instrumentation resulted in approximately US $362 in savings per procedure. This translates to US $108,600 savings annually for the average-volume hip-preservation service (estimated at 300 cases per year).[3] With the incidence of hip arthroscopy on the rise and given its ability to improve health-related quality of life in the younger patient population, finding cost savings is essential to maintaining cost-effectiveness.[10]

Limitations

The following limitations should be noted. First, the presented cohort is from a single surgeon's experience, which may be biased by a specific patient population and a specific surgical technique. For example, this population was relatively young and had relatively low BMIs, so some surgeons may have a different experience depending on their patient demographic characteristics. However, the other coauthors in this study perform hip arthroscopy, on a regular basis, using conventional knee instrumentation. In addition, the senior author has a high-volume, dedicated hip practice, and therefore the ability to perform all surgical procedures with standard-length tools may also be attributed to experience. In this study 12 patients underwent bilateral surgery, and both of their hips were included in the data. However, hip anatomy varies within the same patient, with differences in acetabular and femoral version or in the presence of findings of femoroacetabular impingement,[11] so we believe that inclusion of both hips in patients who underwent bilateral surgery is warranted. The prices used for our comparison were all list prices whereas the actual prices paid may differ significantly among various institutions, according to contractual prices negotiated between the institution and the manufacturer. Portal placement varies depending largely on surgeon preference but also on the procedure being performed. The 2 portals used in this study allow access to the central and peripheral compartments for debridement, repair, and anchor placement, but measurements will vary if a surgeon uses a substantially different portal location. In addition, no power analysis was performed, so the possibility of a type II error exists; however, the sample size is large, making the likelihood of a clinically significant type II error less likely in our opinion.

Conclusions

The distance from skin to socket at the 12- and 3-o'clock positions is less than 11 cm, suggesting that hip arthroscopy usually can be performed with conventional knee-length instrumentation devices. In obese and overweight patients and patients requiring LT debridement or IP tendon release, specific hip arthroscopic tools should be available.

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