Preoperative Fascia Iliaca Block Does Not Improve Analgesia after Arthroscopic Hip Surgery, but Causes Quadriceps Muscles Weakness

A Randomized, Double-blind Trial

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ABSTRACT

Background: Ambulatory hip arthroscopy is associated with postoperative pain routinely requiring opioid analgesia. The potential role of peripheral nerve blocks for pain control after hip arthroscopy is controversial. This trial investigated whether a preoperative fascia iliaca block improves postoperative analgesia.

Methods: In a prospective, double-blinded trial, 80 patients scheduled for hip arthroscopy were randomized to receive a preoperative fascia iliaca block with 40 ml ropivacaine 0.2% or saline. Patients also received an intraarticular injection of 10-ml ropivacaine 0.2% at procedure end. Primary study endpoint was highest pain score reported in the recovery room; other study endpoints were pain scores and opioid use 24 h after surgery. Additionally, quadriceps strength was measured to identify leg weakness.

Results: The analysis included 78 patients. Highest pain scores in the recovery room were similar in the block group (6 ± 2) versus placebo group (7 ± 2), difference: −0.2 (95% CI, −1.1 to 0.7), as was opioid use (intravenous morphine equivalent dose: 15 ± 7 mg [block] vs 16 ± 9 mg [placebo]). Once discharged home, patients experienced similar pain and opioid use (13 ± 7 mg [block] vs 12 ± 8 mg [placebo]) in the 24 h after surgery. The fascia iliaca block resulted in noticeable quadriceps weakness. There were four postoperative falls in the block group versus one fall in the placebo group.

Conclusions: Preoperative fascia iliaca blockade in addition to intraarticular local anesthetic injection did not improve pain control after hip arthroscopy but did result in quadriceps weakness, which may contribute to an increased fall risk. Routine use of this block cannot be recommended in this patient population. (Anesthesiology 2018; 129:536-43)

ARthroscopic hip surgery is being increasingly performed to treat a variety of hip conditions, such as symptomatic labral tears, femoroacetabular impingement, extraarticular lesions, septic arthritis, and synovitis, remove loose bodies, and evaluate unexplained hip pain, chondral injuries, and osteoarthritis. Improved surgical technique with minimally invasive surgery enables the majority of these procedures to be performed in an ambulatory setting. This has led to a steady increase in the number of hip arthroscopies performed in the past few years.

Despite the minimally invasive approach, patients undergoing arthroscopic hip surgery may still experience severe pain after the procedure, routinely requiring opioid analgesia, which can delay patient recovery and discharge. Regional anesthesia techniques have been infrequently applied in these patients, as it is still a matter of debate whether or not peripheral nerve blocks can significantly improve postoperative analgesia after hip arthroscopy. In addition, concerns have been raised about potential risks associated with peripheral nerve blocks of the lower extremity, such as leg weakness.
increasing the risk for postoperative falls. We hypothesized that a fascia iliaca compartment block with dilute local anesthetic, in addition to intraarticular local anesthetic injection, improves postoperative pain control in patients undergoing ambulatory hip arthroscopy while minimizing effects on quadriceps strength.

Materials and Methods

This study was approved by the Institutional Review Board of the University of California, San Francisco, California. The trial was conducted in accordance with the original protocol. Unblinding of the investigators performing the analysis occurred after patient enrollment was completed and the dataset was complete. The trial was registered on clinicaltrials.gov (NCT02623361) 1 yr after recruitment had started. The protocol is available by request from the corresponding author.

Patient Population

Patients scheduled for hip arthroscopy in an academic ambulatory surgery center between December 2014 and December 2016 were approached by their surgeon or via phone by one of the study investigators who had screened the operating room schedule for eligible patients. Exclusion criteria for enrollment included age younger than 18 yr, contraindications for regional anesthesia, preexisting neurologic deficits of the lower extremity, and a history of chronic pain requiring chronic opioid medication.

In this randomized, double-blinded placebo-controlled trial, 80 patients were enrolled after written informed consent was obtained. Randomization followed a randomization plan created before study start with blocks of 20 patients in a 1:1 ratio. Once the study research coordinator had evaluated eligibility, obtained informed consent, and enrolled the participants in the study, a sequentially numbered opaque envelope was opened by another then-unblinded study investigator to reveal the group designation of the patient. Subsequent data collection was performed by the blinded study research coordinator or an additional blinded study investigator.

Study Interventions

Baseline measurements of quadriceps strength were performed on both the surgical and nonsurgical leg. Strength was assessed by measurement of the average force produced by three maximal voluntary isometric contractions with a stationary dynamometer (Chatillon DPPH-250 force gauge, AMETEK, USA). After these measurements, a fascia iliaca compartment block was performed with either 40 ml ropivacaine 0.2% (block group) or 40 ml saline 0.9% (placebo group), based on the group assignment derived from randomization with unmarked syringes that had been prepared by the unblinded investigator. The block procedure was performed by a clinician blinded to the group designation of the patient after sedation of the patient with IV midazolam (0 to 4 mg, titrated to patient comfort) and local anesthesia of the skin with lidocaine 2%. Block technique was standardized to the suprainguinal fascia iliaca block approach as described by Hebbard et al., an approach associated with better analgesia after hip surgery. All blocks were performed with a 50-mm, 22-gauge needle (Pajunk SonoPlex, Pajunk GmbH, Germany) with ultrasound guidance (GE Logiq E, GE Healthcare, USA). Block success and coverage were subsequently assessed by testing for loss of cold sensation on the lateral thigh (lateral femoral cutaneous nerve distribution), anterior thigh (femoral nerve distribution), medial thigh (obturator and femoral nerve distribution), and the medial lower leg (saphenous nerve distribution). Thirty minutes after block completion, measurements of quadriceps strength were repeated by an investigator blinded to the group designation of the patient on both the surgical and nonsurgical leg to evaluate the effects of the regional technique alone on leg strength.

The subsequent surgical procedure was performed under general anesthesia. After induction with IV propofol (2 to 2.5 mg/kg) and placement of a laryngeal mask airway, balanced anesthesia was maintained with propofol (50 to 100 mcg·kg⁻¹·min⁻¹) and sevoflurane. Intravenous fentanyl was given as needed at the discretion of the anesthesiologist, who was blinded to the group designation of the patient. All patients received 4 mg of IV dexamethasone before incision and 4 mg of IV ondansetron at procedure end for postsurgical nausea and vomiting prophylaxis.

Hip arthroscopy procedures were performed by two sports-medicine fellowship-trained orthopedic surgeons, with one surgeon performing 79 out of 80 procedures (A.L.Z.). The majority of patients underwent standard surgical treatment for femoroacetabular impingement. Traction time was maintained less than 70 min for all procedures, and 10 ml of 0.2% ropivacaine was injected intraarticularly at the end of each case.

After the end of the surgical procedure and emergence from anesthesia, patients were transferred to the postanesthesia care unit. Postsurgical pain was assessed repeatedly by an investigator blinded to the group designation of the patients and was treated with IV fentanyl and IV hydromorphone as needed to achieve a numerical rating score of four or less. Cases of postoperative shivering were treated with 12.5 to 25 mg of IV meperidine. Once the patient reported good pain control and met postanesthesia care unit discharge criteria, a last set of quadriceps strength measurements was performed on both the surgical and nonsurgical leg. The tests for block success and coverage by assessing loss of cold sensation in the distribution of the femoral, obturator, lateral femoral cutaneous, and saphenous nerve were also repeated.

Patients received oral hydrocodone/acetaminophen or oxycodone before discharge if they were still experiencing discomfort. Patients were instructed to use acetaminophen and nonsteroidal antiinflammatory drugs in addition to opioids to control their pain after discharge.

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Perioperative opioid requirements are recorded as IV morphine equivalent doses calculated as (fentanyl IV [mcg] × 0.1) + (hydromorphone IV [mg] × 6.67) + (hydrocodone PO [mg] × 0.33) + (oxycodeine PO [mg] × 0.5) + (meperidine IV [mg] × 0.1) with our institutional opioid equivalence table (Supplemental Digital Content, http://links.lww.com/ALN/B738).

The patients were telephoned by an investigator blinded to the group designation of the patient 24 to 48 h after discharge from the ambulatory surgery center to record pain scores and analgesics use after discharge, document potential anesthesia-related complications, perform a modified pain diary, and assess patient satisfaction for the first 24 h after surgery. The modified pain diary assessed how pain interfered with sleep quality in the first night and determined walking ability in the first 24 h after surgery, with a score from 0 (pain does not interfere) to 10 (pain completely interferes). Patient satisfaction was recorded with a scale from 0 (unsatisfied) to 10 (extremely satisfied).

Primary endpoint of the study was the highest pain scores reported in the recovery room. Secondary endpoints were the pain score at discharge, opioid requirements in the recovery room, and pain scores and opioid requirements in the first 24 h after discharge. Other endpoints recorded were incidence of opioid-related side effects, quadriceps strength after nerve block and surgery, perceived leg weakness, walking ability, and overall patient satisfaction.

Sample Size Calculation
Based on our preliminary study, we expected the highest recorded numerical rating score in the recovery room (primary endpoint) in the placebo group to be 6 ± 3 and a reduction of numerical rating scores by 33% in the block group. With a power of 80% and accepting an alpha error of 0.05, 70 patients would be needed to reach significance. In order to be able to compensate for incomplete data collection or patients being lost to follow-up, 80 patients were enrolled.

Statistics
Continuous variables are reported as mean values and SDs. Comparison between groups for the primary outcome (highest numerical rating scores in the recovery room) was done with an independent Student’s t test. Differences in secondary outcomes between groups were analyzed with independent Student’s t tests for continuous variables and Fisher exact tests for nominal variables. Two-way ANOVA for the factors group and time of measurement was used for repeated measures (quadriceps strength). Bonferroni post hoc tests were used for pairwise comparisons. Statistical analysis was performed by Stata (Version 14.1, StataCorp, USA).

Results
In total, 80 patients were enrolled into the study. Figure 1 displays the flow of participants through the study. On the day of surgery, 78 patients completed the study successfully. One patient decided to withdraw from the study before surgery start, and one patient was removed from analysis due to a protocol violation: the patient received the wrong study intervention due to miscommunication between investigators. Patient characteristics of the 40 patients in the placebo group and the remaining 38 patients in the block group are summarized in table 1.

Three patients in the placebo group were lost to 24 h follow-up. In addition, postoperative fall data were not recorded in two patients (both in block group), and postoperative opioid consumption was not recorded in six patients (four in the placebo group, two in the block group). Leg strength measurements were performed at baseline and before discharge in all 78 patients who completed the study. The strength measurement performed 30 min after block placement could only be completed in 40 patients (22 in placebo group, 18 in block group) before the patient was taken into the operating room. Since there were no differences in primary and secondary endpoints between patients with complete and incomplete datasets, no patients were eliminated from the analysis and all collected data were used for statistical analysis. In summary, the analysis is based on 78 patients for data collected on the day of surgery, except for the strength data, in which case the analysis is based on 40 patients. The analysis of postdischarge data is based on data from 75 patients, except for the fall data (73 patients) and the postdischarge opioid consumption data (69 patients).

Patient characteristics of both groups are summarized in table 1, demonstrating two very similar groups. The vast majority of patients (76 of 78 patients) were treated for femoroacetabular impingement, with several patients undergoing multiple procedures. Types and duration of surgery were similar between both groups. All patients received two portals for arthroscopic approach in the anterolateral and the midanterior position (fig. 2). There were no intraoperative complications.

Block success rate in the block group as assessed by loss of cold sensation was high. In the group that had received a fascia iliaca compartment block with ropivacaine, loss of cold sensation was detected before surgery in 16 out of 18 patients at the anterior thigh, in 15 out of 18 patients at the medial thigh, in 17 out of 18 patients at the lateral thigh, and 14 out of 18 patients at the medial lower leg. In those patients that were assessed before discharge, we saw loss of cold sensation in 32 out of 38 patients at the anterior thigh, in 32 out of 38 patients at the medial thigh, in 33 out of 38 patients at the lateral thigh and 30 out of 38 patients at the medial lower leg.

Highest pain scores in the recovery room, the primary endpoint of this investigation, were similar in the block group (6±2) versus the placebo group (7±2), difference: −0.2 (95% CI, −1.1 to 0.7). Perioperative opioid requirements and postanesthesia care unit length of stay were also similar in the two groups (table 2). After discharge, there were no differences in pain scores and opioid use between
Consolidated Standards of Reporting Trials flow diagram displaying the flow of participants through the study.

Fig. 1. Consolidated Standards of Reporting Trials flow diagram displaying the flow of participants through the study.

Table 1. Patient and Surgery Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Placebo Group (n = 40)</th>
<th>FICB Group (n = 38)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (M, F)</td>
<td>17, 23</td>
<td>23, 15</td>
<td>0.111</td>
</tr>
<tr>
<td>Age, yr</td>
<td>32 ± 9</td>
<td>35 ± 11</td>
<td>0.156</td>
</tr>
<tr>
<td>BMI</td>
<td>26 ± 4</td>
<td>26 ± 4</td>
<td>0.569</td>
</tr>
<tr>
<td>ASA (I, II, III)</td>
<td>28, 11, 1</td>
<td>26, 12, 0</td>
<td>0.587</td>
</tr>
<tr>
<td>Preoperative hip pain: NRS, 0–10</td>
<td>2 ± 2</td>
<td>2 ± 3</td>
<td>0.948</td>
</tr>
<tr>
<td>Surgery duration</td>
<td>90 ± 16</td>
<td>96 ± 28</td>
<td>0.141</td>
</tr>
<tr>
<td>Surgery type (no. of cases)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cam repair</td>
<td>39</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Pincer repair</td>
<td>26</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Labral repair</td>
<td>38</td>
<td>35</td>
<td></td>
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<tr>
<td>Loose body removal</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Screw removal</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Microfracture</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Debridement</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
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</table>

Data presented as mean ± SD or as otherwise noted.
ASA = American Society of Anesthesiologists Physical Status Class; BMI = body mass index; F = female; FICB group = fascia iliaca compartment block group; M = male; NRS = numerical rating scale.

Fig. 2. Image of the arthroscope portal positions routinely used in this study. Right hip in supine position. The anterior superior iliac spine is marked cephalad, and the outline of the greater trochanter is marked posterior to the two arthroscope portals in the anterolateral and midanterior position.
Table 2. Perioperative Opioid Use, as Intravenous Morphine Equivalent Dose and Recovery Room Pain Scores, and Recovery Time, Defined as Time until Recovery Room Discharge Criteria Were Met after Ambulatory Hip Arthroscopy

<table>
<thead>
<tr>
<th></th>
<th>Placebo Group (n = 40)</th>
<th>FICB Group (n = 38)</th>
<th>Risk Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intraoperative opioid use (IV MED), mg</td>
<td>11 ± 5</td>
<td>9 ± 5</td>
<td>−1.7 (−4.1 to 0.6)</td>
</tr>
<tr>
<td>Highest NRS in recovery room, 0–10 scale</td>
<td>7 ± 2</td>
<td>6 ± 2</td>
<td>−0.2 (−1.1 to 0.7)</td>
</tr>
<tr>
<td>Recovery room opioid use (IV MED), mg</td>
<td>16 ± 9</td>
<td>15 ± 7</td>
<td>−0.2 (−0.8 to 0.5)</td>
</tr>
<tr>
<td>Time until discharge criteria met, min</td>
<td>128 ± 37</td>
<td>123 ± 34</td>
<td>−5 (−21 to 11)</td>
</tr>
<tr>
<td>NRS at discharge, 0–10 scale</td>
<td>3 ± 1</td>
<td>3 ± 1</td>
<td>−0.2 (−11 to 0.7)</td>
</tr>
</tbody>
</table>

Data presented as mean ± SD or as otherwise noted. Risk difference between groups presented as mean (FICB group) − mean (placebo group) and 95% CI. IV MED (mg) calculated as (fentanyl IV [mcg] × 0.1) + (hydromorphone IV [mg] × 6.67) + (hydrocodone PO [mg] × 0.33) + (oxycodone PO [mg] × 0.5) + (meperidine IV [mg] × 0.1).

FICB group = fascia iliaca compartment block group; IV MED = intravenous morphine equivalent dose; NRS = numerical rating scale.

Table 3. Postoperative Pain Scores and Opioid Use as Intravenous Morphine Equivalent Dose after Discharge in the First 24 h after Ambulatory Hip Arthroscopy

<table>
<thead>
<tr>
<th></th>
<th>Placebo Group (n = 37)</th>
<th>FICB Group (n = 38)</th>
<th>Risk Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest NRS post discharge</td>
<td>6 ± 2</td>
<td>6 ± 2</td>
<td>−0.5 (−1.5 to 0.6)</td>
</tr>
<tr>
<td>Lowest NRS post discharge</td>
<td>2 ± 2</td>
<td>2 ± 2</td>
<td>−0.4 (−1.3 to 0.5)</td>
</tr>
<tr>
<td>Average NRS post discharge</td>
<td>4 ± 2</td>
<td>4 ± 2</td>
<td>−0.2 (−1.1 to 0.7)</td>
</tr>
<tr>
<td>24 h opioid use post discharge (IV MED)</td>
<td>12 ± 8</td>
<td>13 ± 7</td>
<td>1.0 (−2.7 to 4.7)</td>
</tr>
</tbody>
</table>

Data presented as mean ± SD or as otherwise noted. Risk difference between groups presented as mean (FICB group) − mean (placebo group) and 95% CI. IV MED calculated as (fentanyl IV [mcg] × 0.1) + (hydromorphone IV [mg] × 6.67) + (hydrocodone PO [mg] × 0.33) + (oxycodone PO [mg] × 0.5).

FICB group = fascia iliaca compartment block group; IV MED = intravenous morphine equivalent dose; NRS = numeric rating scale.

Discussion

Since the majority of hip arthroscopy surgery is performed in an ambulatory setting, a quick recovery from surgery and anesthesia is necessary. However, the use of postoperative opioid analgesia increases the risk for opioid-related complications and delayed discharge. Regional anesthesia has been shown to enhance recovery in various settings of orthopedic surgery, but the routine use of regional anesthesia techniques to improve analgesia after hip arthroscopy is not established. While a recently published systematic review on the use of perioperative nerve blocks concluded that nerve blocks provide effective pain management after hip arthroscopy, the level of evidence from these studies was very low. Of the nine studies included in this review, only one was rated as high quality. Methodologies of the reviewed studies differed dramatically. Three of the cited studies used postoperative blocks, and several different regional anesthesia techniques had been investigated, including lumbar plexus blocks, the fascia iliaca compartment block alone already reduces quadriceps strength at 30 min (table 4). While the patients ranked walking ability with crutches similarly in both groups, significantly more patients in the fascia iliaca compartment block group reported weakness in their leg: 76% in the block group versus 49% in the placebo group (relative risk, 1.6; 95% CI, 1.1 to 2.3). There were four reported falls in the fascia iliaca compartment block group and one fall in the placebo group (relative risk, 4.1; 95% CI, 0.5 to 35.0).
femoral nerve blocks, lumbar paravertebral blocks, and fascia iliaca blocks. Such variety of regional techniques reflects that there is no consensus on the best regional anesthetic approach for patients undergoing hip arthroscopy. The current investigation used the fascia iliaca compartment block because it has several attractive advantages over other lower-extremity blocks, including its ease of performance, reported reliable coverage of the majority of nerves responsible for the innervation of the hip, and its track record of efficacy in the treatment of pain from hip fractures and total hip arthroplasty. Furthermore, we expected that the injection of dilute local anesthetic at a distance from the femoral nerve would result in reduced quadriceps weakness.

However, our randomized trial contradicts the conclusion of those previous studies, suggesting that the preoperative fascia iliaca block does not provide significant analgesia after hip arthroscopy, likely due to incomplete coverage of the surgical field. The femoral and obturator nerves are known to innervate the anterolateral and anteromedial portions of the hip joint, respectively. However, posteriorly, the superior gluteal nerve, the nerve to the quadratus femoris, and the sciatic nerve are responsible for lateral, inferior, and superior portions of the joint. These nerves originate in the sacral plexus and are not covered by the fascia iliaca compartment block. We expected that the intraarticular injection of local anesthetic would provide coverage in those portions of the joint that are not covered by the fascia iliaca block and thus make the analgesia provided by the fascia iliaca block more apparent. However, this was not the case. We have to assume that performing a fascia iliaca block without intraarticular injection would have a similar negative result, as it potentially worsens the issue of only incomplete coverage of the joint.

This failure to improve pain control with preoperative fascia iliaca compartment block contrasts with our experience...
of good pain relief achieved with postoperatively performed fascia iliaca compartment block, despite the fact that there is only limited variation in the patient population and the surgical procedures performed during arthroscopic hip surgery in our ambulatory surgery center. Most hip arthroscopies include osteotomies, the procedures associated with the most postoperative pain. However, several mechanisms can explain higher success rates with postoperative blocks: (1) patient selection, as only patients with high postoperative pain scores are likely to receive a postoperative block; (2) the placebo effect of the invasive block procedure; (3) the patient’s ability to perceive a reduction in nociceptive input despite incomplete coverage of the surgical area, which translates into pain relief; and lastly (4) adaptive or stress-induced analgesia, the phenomenon that a painful stimulus is perceived as less painful when it is preceded by a more painful stimulus or state. It is therefore not surprising that studies using postoperative blocks after hip arthroscopy showed improvements in pain control.15,16

Another recently published randomized trial supports our finding that the preoperative fascia iliaca compartment block fails to provide substantial pain control after hip arthroscopy. In the study by Garner et al., a preoperative fascia iliaca compartment block compared to local anesthesia infiltration of the portal tracts at the end of surgery resulted in inferior pain control in the fascia iliaca compartment block group.17 In our study we used the fascia iliaca compartment block in addition to intraarticular injections of local anesthetic. Intraarticular injections are preferred by a majority of surgeons to address pain from capsular injury,18 as they result in better postoperative pain control than infiltration of the portal tracts.19 However, both studies suggest that the preoperative fascia iliaca compartment block does not significantly contribute to postoperative pain control after hip arthroscopy because of incomplete coverage of the surgical area. The only other study to investigate the use of a preoperative fascia iliaca compartment block is a prospective case series that demonstrated high patient satisfaction in patients receiving the block; however, study quality was low due to lack of a control group.20 In summary, there is no evidence that the preoperative fascia iliaca block improves pain control after hip arthroscopy.

A potential downside of peripheral nerve blocks of the lower extremity is motor weakness that could increase the risk for postoperative falls. Xing et al. demonstrated that femoral nerve blocks can reduce postoperative pain at various points after arthroscopic hip surgery, but at the same time, the study reported a fall rate of 22% in the femoral nerve block group.21 YaDeau et al. found no improvements in analgesia in hip arthroscopy patients who received preoperative lumbar plexus blocks when compared to control patients, but two patients who received blocks fell in the recovery room bathroom.22 Lower-extremity nerve blocks that affect the femoral nerve are known to result in quadriceps weakness. The fascia iliaca block is frequently considered a favorable alternative, resulting in reduced weakness because of the use of lower local anesthetic concentrations and an injection more distant from the femoral nerve.13 However, the current study refutes the hypothesis that a fascia iliaca compartment block with dilute ropivacaine results in only moderate impairment of leg strength. The reduction in leg strength after fascia iliaca compartment block was profound, and this may have contributed to the increased number of falls that were seen in the fascia iliaca compartment block group.

The current study was underpowered to detect a significant difference in falls between groups. Although the association between leg weakness and falls seems very plausible, it is still hypothetical. Another limitation of the study is the fact that when quadriceps strength was tested 30 min after block performance, the motor weakness was most likely still developing. Nonetheless, at this point, we already observed a reduction of quadriceps strength after fascia iliaca compartment block. Our study population was limited to mostly young and healthy patients, the most common patient population in an ambulatory orthopedic surgery center. However, the increasing popularity of hip arthroscopies will likely result in a wider patient population undergoing this procedure, who may have a different pain experience. Lastly, our study was performed in an academic institution, with a large number of blocks being performed by trainees. Of note, our observed rates of block success when testing the sensory blockade was almost identical to the study by Capdevila et al.,10 and the observed motor blockade indicated a high success rate of the blocks, which reflects standard anesthesia practice.

We cannot exclude that this investigation may have failed to detect a small treatment effect. However, a clinically significant effect of a regional anesthesia technique would have been either a level of pain after surgery that does not interfere with ambulation, opioid avoidance, or at least a substantial opioid reduction for the duration of the block. The analgesic interventions used in this study clearly fell short of this goal. The results of this study should be applicable to other patients resembling our study population who are receiving a preoperative fascia iliaca compartment block for hip arthroscopy, as there is currently no variation of the block or approaches to supplement this block available that could improve its joint coverage. Furthermore, any peripheral nerve block that results in femoral nerve blockade will most likely be associated with similar quadriceps weakness, thus limiting its use.

The outlined limitations of regional anesthetic techniques create a challenge for their use in the treatment of pain after hip arthroscopy. However, since postoperative pain scores rapidly improved in our investigation with moderate amounts of opioids, the need for a regional anesthetic intervention must ultimately be questioned.

In summary, our study demonstrates a questionable efficacy of preoperative fascia iliaca compartment block in reducing postoperative pain after hip arthroscopy and...
profound quadriceps weakness seen at discharge. These findings do not support the routine use of the preoperative fascia iliaca compartment block in patients undergoing ambulatory hip arthroscopy.

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Support was provided solely from departmental sources.

Competing Interests
The authors declare no competing interests.

Reproducible Science
Full protocol available at: matthias.behrends@ucsf.edu. Raw data available at: matthias.behrends@ucsf.edu.

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