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Practice Guidelines

Regional Nerve Blocks in Primary Total Hip Arthroplasty: The Clinical Practice Guidelines of the American Association of Hip and Knee Surgeons, American Society of Regional Anesthesia and Pain Medicine, American Academy of Orthopaedic Surgeons, Hip Society, and Knee Society

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The American Association of Hip and Knee Surgeons (AAHKS), The American Academy of Orthopaedic Surgeons (AAOS), The Hip Society, The Knee Society, and The American Society of Regional Anesthesia and Pain Medicine (ASRA) have worked together to develop evidence-based guidelines on the use of regional nerve blocks in primary total hip arthroplasty (THA). The purpose of these guidelines is to improve the treatment of orthopedic surgical patients and reduce practice variation by promoting a multidisciplinary, evidence-based approach to the use of regional nerve blocks following primary THA.

The combined clinical practice guidelines are meant to address common and important questions related to the efficacy and safety of regional nerve blocks in primary THA. Utilizing the AAOS Clinical Practice Guidelines and Systematic Review Methodology, the committee members completed a systematic review and meta-analysis to support the clinical practice guidelines [1]. For each question, we have provided a recommendation, assessed the strength of the recommendation, and elaborated on the rationale of the recommendation, which should be interpreted in accordance with the AAOS Clinical Practice Guidelines and Systematic Review Methodology [1]. The current clinical practice guidelines were based on the available evidence, and future updates may become necessary as additional literature becomes available with future research.

Guideline Question 1

For patients undergoing primary total hip arthroplasty, do perioperative regional nerve blocks affect postoperative pain, opioid consumption, and/or complications?

Block vs Control Recommendation

Response/Recommendation 1A

Single-shot fascia iliaca block could reduce postoperative pain and opioid consumption without an increase in adverse events after primary total hip arthroplasty.

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Strength of Recommendation 1A

Moderate.

Response/Recommendation 1B

Single-shot lumbar plexus nerve block could reduce postoperative pain and opioid consumption after primary total hip arthroplasty; however, providers should consider the technical demands of the procedure and safety concerns regarding the need for close patient monitoring with a lumbar plexus nerve block.

Strength of Recommendation 1B

Moderate.

Response/Recommendation 1C

Single-shot quadratus lumborum block may reduce postoperative pain and opioid consumption after primary total hip arthroplasty; however, providers should consider the technical demands of the procedure and safety concerns regarding the need for close patient monitoring with a quadratus lumborum block.

Strength of Recommendation 1C

Limited.

Block vs Block Recommendation

Response/Recommendation 1D

There is no difference between a single-shot fascia iliaca or lumbar plexus nerve block in postoperative pain or opioid consumption after primary total hip arthroplasty; however, providers should consider the different risks associated with each regional nerve block.

Strength of Recommendation 1D

Moderate.

Rationale

We reviewed eight high-quality randomized clinical trials that represented the best available evidence to assess the effectiveness of fascia iliaca compartment, lumbar plexus nerve, and quadratus lumborum regional nerve blocks to reduce pain and/or opioid consumption following primary THA [2–9]. Although additional regional nerve blocks have been studied with randomized clinical trials following primary THA, the workgroup excluded these alternative regional nerve blocks because of limited evidence and lack of clinical relevance. For instance, the use of a femoral or sciatic nerve block is not as anatomically relevant compared to more widely used regional nerve blocks following primary THA. Additionally, the only comparison between types of regional nerve blocks was the single high-quality randomized clinical trial comparing the fascia iliaca compartment and lumbar plexus nerve blocks to reduce pain and/or opioid consumption postoperatively following primary THA [10]. The same limitations encountered in the prior clinical practice guidelines prevented the use of meta-analysis due to the inconsistency in the reporting of outcomes and time points for reporting the outcomes [11–14]. Therefore, a qualitative review of the available literature was used to develop the recommendations.

Among the regional nerve blocks evaluated for the clinical practice guidelines, five high-quality studies investigated single-shot fascia iliaca compartment block, two high-quality studies investigated single-shot lumbar plexus nerve block, and one high-quality study investigated single-shot quadratus lumborum block [2–9]. Qualitative analysis of each regional nerve block consistently demonstrated an overwhelmingly significant response of a reduction in postoperative pain and opioid consumption for all three types of regional nerve blocks [2–9]. Although no significant difference was observed in adverse events between the regional nerve blocks and controls, the reporting was focused on adverse events related to opioid use (eg nausea/vomiting, pruritus, somnolence, and respiratory depression) [2–9]. The lumbar plexus nerve and quadratus lumborum blocks are technically demanding procedures and are considered 'deep blocks', which have the same anticoagulation restrictions as neuraxial anesthesia [15]. In addition, lumbar plexus nerve and quadratus lumborum blocks require postprocedure monitoring because there is the possibility of bilateral spread due to placement in the epidural or intrathecal spaces [15]. In contrast, the fascia iliaca compartment block is a less technically demanding procedure without the same safety concerns and is not considered a "deep block"[15].

The workgroup downgraded the strength of the recommendations for fascia iliaca compartment, lumbar plexus nerve, and quadratus lumborum blocks based on the increased cost associated with the blocks, particularly in light of our advancements with effective multimodal analgesia of oral medications and periarticular local anesthetic infiltration for THA. In addition, the lack of appropriate reporting of adverse events for lumbar plexus nerve and quadratus lumborum blocks was an additional concern cited for downgrading the strength of the recommendation for lumbar plexus nerve and quadratus lumborum blocks. Although the workgroup would advocate for reporting adverse events specific to the nerve blocks, the relatively small sample sizes may not be large enough to accurately represent the frequency of these adverse events.

Among the clinically relevant regional nerve blocks for primary THA, only a single high-quality randomized clinical trial offered a comparison between nerve blocks [10]. When comparing the fascia iliaca compartment and lumbar plexus nerve blocks, it demonstrated no significant difference in postoperative pain and opioid consumption [10]. Therefore, when a regional nerve block is used after primary THA, the workgroup would favor a fascia iliaca compartment block, as the increased risks and technical demands of a lumbar plexus nerve block do not come with any additional benefit.

Guideline Question 2

For patients undergoing primary total hip arthroplasty, is there a difference between perioperative regional nerve blocks, periarticular local anesthetic infiltration, or a combination of these methods in postoperative pain, opioid consumption, and/or complications?

Response/Recommendation 2A

There is no difference between a single-shot fascia iliaca block or periarticular local anesthetic infiltration in postoperative opioid consumption after primary total hip arthroplasty.

Strength of Recommendation 2A

Moderate.

Response/Recommendation 2B

There is no difference between a single-shot lumbar plexus nerve block or periarticular local anesthetic infiltration in postoperative pain or opioid consumption after primary total hip arthroplasty.

Strength of Recommendation 2B

Moderate.

Rationale

Among the clinically relevant regional nerve blocks for primary THA, a single high-quality randomized clinical trial compared a fascia iliaca compartment block and periarticular local anesthetic infiltration, and a single high-quality randomized clinical trial compared a lumbar plexus nerve block and periarticular local anesthetic infiltration [16,17]. Both randomized clinical trials demonstrated periarticular local anesthetic infiltration is equivalent to either a fascia iliaca compartment or lumbar plexus nerve block regarding postoperative pain and opioid consumption [16,17]. Periarticular local anesthetic infiltration should be considered first before resorting to a regional nerve block in primary THA because the additional cost and risk associated with a regional nerve block do not offer any additional benefit compared to periarticular local anesthetic infiltration. Therefore, we recommend the use of periarticular local anesthetic infiltration over the routine use of regional nerve blocks following primary THA. However, if a patient's circumstance does warrant a regional nerve block, we recommend the use of a fascia iliaca compartment block.

Areas for Future Research

Although the best available evidence included numerous high-quality randomized clinical trials, we are still presented with limitations in the literature when formulating the clinical practice guidelines. We were unable to make stronger recommendations regarding the comparison between individual regional nerve blocks, as well as between regional nerve blocks and periarticular local anesthetic infiltration, due to a lack of more high-quality studies. We suggest future research on regional nerve blocks for primary THA focus on providing supplemental literature comparing between the relevant regional nerve blocks, as well as between the regional nerve blocks and periarticular local anesthetic infiltration. Additionally, we suggest the reporting of adverse events for future studies on regional nerve blocks be expanded to include events specific to the anesthetic procedures in order to provide a better evaluation of the risks associated with each procedure.

Peer Review Process

Following the committee's formulation of the Clinical Practice Guideline draft, it underwent a peer review by the board of directors from AAHKS, ASRA, and the Hip and Knee Societies. The AAOS Evidence-Based Quality and Value Committee reviewed the Clinical Practice Guideline draft for endorsement, followed by the Council on Research and Quality, and last, the AAOS Board of Directors. Additionally, the publication of the systematic review and meta-analysis on regional nerve blocks in primary hip total arthroplasty that supported the formulation of the Clinical Practice Guideline has undergone peer review for publication.

Disclosure Requirement

All authors or contributors to the Clinical Practice Guideline have provided a disclosure statement in accordance with the publicly available AAOS Orthopedic Disclosure Program. In accordance with the AAOS Clinical Practice Guidelines and Systematic Review Methodology, all authors and contributors attest none of the current disclosures are relevant to the Clinical Practice Guidelines, and no prior relevant financial conflict was within a year of initiating work on the guideline.

FDA Clearance Statement

According to the FDA, it is the prescribing physician's responsibility to ascertain the FDA clearance status for all medications prior to use in a clinical setting.

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