Total hip arthroplasty and peripheral nerve blocks: Limited but salient role?

Total hip arthroplasty (THA) is a very common and successful surgical intervention. It involves surgery of the femoral head and acetabulum, and could be partial or total, and cemented or uncemented. With increased life expectancy and availability of low-cost surgery, the number of THAs is on the rise in the country. In 2013, the Indian Society of Hip and Knee Surgeons noted in its registry a total of 3604 THAs performed over the past 6 years, with the indication being avascular necrosis (AVN) in 49% cases. THA has been on the rise since then, and it is estimated that more than 950,000 primary and revision procedures were performed globally in 2010. A key factor for success of THA has been early mobilization within as little as 48 h in “fast track” cases. Contribution of adequate postoperative pain relief toward early mobilization is of paramount importance and undeniable.

Techniques to provide postoperative analgesia for patients undergoing THA include systemic analgesia with opioids or nonsteroidal anti-inflammatory drugs, local infiltration analgesia, spinal opioids with or without local anaesthetics, and peripheral nerve blocks.

In this issue, Adhikary et al. report a retrospective propensity score-matched cohort study to compare two peripheral nerve blocks for postoperative analgesia in patients undergoing THA. The two techniques include previously established lumbar plexus and the newer quadratus lumborum block administered through transmuscular approach. The 24-h opioid consumption was compared as primary outcome measure and noted to be similar with both blocks, indicating similar analgesic efficacy [lumbar plexus: 33.6 (22.9–48.5) mg and quadratus lumborum: 32.8 (24.8–58.3) mg]. Although the study in itself has generated preliminary grounds for use of quadratus lumborum block in patients undergoing THA, it raises several issues for discussion. Most importantly, the role of peripheral nerve blocks in patients undergoing THA needs to be dwelled upon.

Central neuraxial blocks including subarachnoid or epidural component have been used successfully for THA for a long time. With regard to extending their use for postoperative analgesia, there is definite familiarity, simplicity, ease, and safety associated with these spinal techniques. Using opioid in subarachnoid or epidural component provides extended postoperative analgesia and limits the dose of local anaesthetic solution resulting in decreased risk of lower limb muscle weakness thus obviating delay in ambulation. Then is there really any advantage associated with, and thus a role for peripheral nerve blocks for postoperative analgesia in patients undergoing THA over and above the spinal techniques? A very recent Cochrane review concluded that use of peripheral nerve blocks when compared to neuraxial block offer no difference in pain relief, hospital stay, or patient satisfaction. Notably, one case each among the total of 1288 patients receiving a peripheral nerve block developed local hematoma and persistent paresis.

In addition, the complications of each peripheral nerve block technique can vary and some are extremely pertinent to THA. The plethora of peripheral nerve blocks for THA includes lumbar plexus-psosas, parasacral sciatic, femoral nerve block, and three-in-one block in addition to the newer quadratus lumborum block. Certain of these such as femoral and even transmuscular quadratus lumborum can be associated with upto 90% incidence of quadriceps weakness. Contribution of quadriceps weakness to risk of fall and delayed ambulation would be worrisome, offsetting the advantage of analgesic efficacy by delaying recovery.

Performing peripheral nerve blocks implies an additional intervention for the patient besides the central neuraxial block, with no added advantage that the spinal cannot provide. Thus, it is not surprising that recent case reports as well as Adhikary et al. have used quadratus lumborum block in patients undergoing THA with general and not central neuraxial anesthesia. The use of general anesthesia for THA is, however, not preferred since central neuraxial blocks offer well-established advantages over it. These include decreased blood loss and incidence of deep vein thrombosis, as well as earlier ambulation. Thus, the use of peripheral nerve blocks would also be limited, as is general anesthesia, to those with contraindication to spinal block such as coagulopathy or obstructive sleep apnea. In the presence of a coagulopathy, the preference again would be for superficial peripheral nerve blocks rather than deeper ones such as lumbar plexus or transmuscular quadratus lumborum block that are fraught with the same limitations as for neuraxial blocks and hence are best avoided.

Against the above background, it appears intuitively and clinically most acceptable to continue a central neuraxial blockade into postoperative period for analgesia, using intrathecal opioid as an adjunct. Is it then more appropriate...
to compare a peripheral technique with continuous central neuraxial block rather than with another nerve block? The high dose of systemic morphine requirement in both groups in the study by Adhikary et al. in the current issue[5] seems to suggest that intrathecal opioid-based central neuraxial block is probably a “gold standard” (?) for postoperative analgesia in THA and is what peripheral nerve blocks need to be compared with.

The quadratus lumborum block is a newer technique that evolved from Transversus Abdominis Plane (TAP) block.[10] The technique has been reviewed by Adhikary et al.[3] as well as more extensively elsewhere.[11] The central notion to be considered for clinical effectiveness of the block is the heterogeneity in the technique and hence the likely results. The spread of injectate following quadratus lumborum block depends on the approach, site of entry, and direction of needle. Broadly, the local anaesthetic may track medially and caudally along the psoas muscle to affect nerves of lumbar plexus; or medially and cranially through the diaphragm into thoracic paravertebral spaces.[10] The block may thus provide analgesia of inguinal area, hip region, and the abdominal wall[10] depending on the precise technique of quadratus lumborum block used. With the transmuscular quadratus lumborum block wherein the local anaesthetic is deposited between the psoas muscle and quadratus lumborum, there is likely spread to L2/L3 vertebral area, lateral spread to lateral cutaneous nerve of thigh, and caudally under fascia iliaca.[5] In contrast, using an intramuscular variant of the block causes very limited spread around the quadratus lumborum, a small area of the flank and proximal lateral thigh. Thus, under the larger umbrella of a “quadratus lumborum” block, several individual variations in the technique may occur with different clinical applications.

While we feel that the study by Adhikary et al.[5] will serve to stimulate further research in the area, hopefully keeping in mind the above discussion, the role of peripheral nerve blocks in THA itself needs detailed consideration.

Asha Tyagi, Rashmi Salhotra
Department of Anaesthesiology, University College of Medical Sciences and GTB Hospital, Dilshad Garden, Shahdra, New Delhi, India

Address for correspondence: Dr. Asha Tyagi, Department of Anaesthesiology, UCMS and GTB Hospital, Dilshad Garden, New Delhi - 110 095, India. E-mail: drashatyagi@gmail.com

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Quick Response Code: [QR Code Image]
Website: www.joacp.org
DOI: 10.4103/joacp.JOACP_114_18

How to cite this article: Tyagi A, Salhotra R. Total hip arthroplasty and peripheral nerve blocks: Limited but salient role? J Anaesthesiol Clin Pharmacol 2018;34:379-80.
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