LETTER TO THE EDITOR

A new approach in the treatment of hip osteoarthritis: ultrasound-guided 3-in-1 injection

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Osteoarthritis (OA) of the hip is a very common chronic condition characterised by progressive erosion of the articular hyaline cartilage, inflammation of the synovial membrane, and degeneration of the joint capsule and musculotendinous structures, resulting in structural damage to the entire joint. The treatment approach for hip OA is multifaceted, focusing on pain reduction and improvement in function. There are many treatment modalities, and non-surgical treatment options remain popular, especially in the younger population. Among non-surgical treatments, intra-articular injections, treatments for trigger points in myofascial pain syndrome, and nerve blocks are frequently used.[1-3]

Pericapsular nerve group (PENG) block is one of the nerve block treatment options for hip OA. PENG block is an interfascial plane block targeting the articular branches of the femoral, obturator and axial obturator nerves in the anterior hip capsule. Studies have shown that PENG block reduces pain and improves function in hip OA. However, even though this blockade is known as a motor protective blockade, quadriceps weakness was observed in 25% of cases. This may be because local anaesthetics during blockade affect the femoral nerve through the plane between the pectineus and psoas major.[4] Therefore, the iliopsoas plane (IP) block, another block that blocks the articular branches of these nerves in the IP, has gained popularity. The advantage of IP block over PENG block is that motor block has not been demonstrated with this blockade. In addition, PENG block directed deep to the iliopsoas tendon can cause motor blockade as well as an iliopectineal bursal injection and bursal tear. Yeoh et al.[4] recommended PENG block when quadriceps weakness is not an urgent problem; otherwise, they recommended IP block when quadriceps weakness is not desired. When we look at the literature, as far as we know, there was no use of the IP block in hip OA. Here, we present a new technique in which intra-articular injection, injection for myofascial pain in muscle, and IP block can be performed with a single needle under ultrasound guidance in hip OA.

The ultrasound probe is placed on the anterior superior iliac spine (ASIS) and slid distal medially. The iliopsoas muscle and femoral head are visualised. The IP between the iliopsoas muscle and the capsular ligament at the femoral head is a potential space for IP block. Once this image is obtained, the femoral neck is included in the image by shifting the probe laterally, slightly distally. The sartorius muscle is visualised superolateral to the iliopsoas muscle, and the rectus femoris muscle is visualised laterally.[5] The needle is then directed to the plane between the capsular ligament and iliopsoas muscle, and an IP block is performed. The needle is guided into the femoral neck without removing it from the skin surface, and an intra-articular injection is performed. Afterwards, one can administer injections to the muscle's palpable trigger points. In this way, nerve blockage, trigger point injections in the relevant muscles, and intra-articular injections can be performed with a single needle in hip OA. This can be advantageous for those with needle phobia and in terms of saving time.

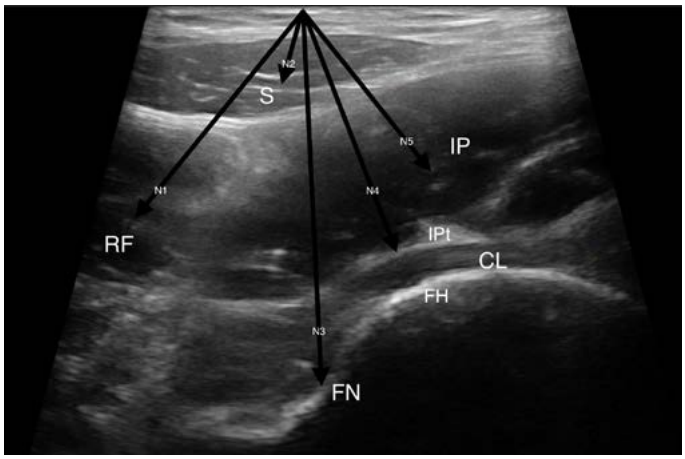

Figure 1. Out-of-plane technique to guide the needle for iliopsoas block, intra-articular injection, and trigger point injection in related muscles
CL: capsular ligament; FH: femoral head; FN: femoral neck; IP: iliopsoas plane; IPt: iliopsoas tendon; RF: rectus femoris muscle; S: sartorius muscle; N1, N2, N5: orientation of the needle for trigger point injection into the relevant muscles; N3: orientation of the needle for intra-articular injection; N4: orientation of the needle for the iliopsoas plane block

As a result, a new technique in the treatment of hip OA has been described in this letter, and it is stated that more than one point can be treated with the same needle.

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DOI 10.17159/2309-8309/2025/v24n4a1

Reply

Thank you for your correspondence regarding this innovative approach to the management of hip osteoarthritis (OA) using an ultrasound-guided 3-in-1 injection technique. The concept of simultaneously performing an iliopsoas plane (IP) block, an intra-articular hip injection and a trigger point injection using a single needle is compelling. It represents a novel and patient-centred approach to a problem of significant global concern.

Fu et al., in 2022, highlighted the dramatic and escalating universal burden of hip OA. They reported that the disability-adjusted life years (DALYs) attributable to the condition increased from 0.46 million in 1990 to 1.04 million in 2019, representing a noteworthy 127% rise over less than three decades.[1] This increase indicates both a global ageing population and the increase of lifestyle and metabolic risk factors, but also the persistent gap in effective, enduring non-surgical strategies for joint preservation. Hip OA is a leading cause of chronic pain, impaired functionality and compromised independence. It is predicted that more than a billion people will be affected by OA globally by 2050.[2] Against this backdrop, your proposed technique offers an attractive possibility: a streamlined, minimally invasive and seemingly motor-sparing intervention capable of targeting multiple pain generators in a single session.

An obvious and elegant anatomical rationale for this approach exists. The IP block seemingly precludes the quadriceps weakness intermittently occurring with pericapsular nerve group (PENG) blocks, which may affect the femoral nerve due to anaesthetic spread into the fascial plane between psoas and pectineus. The choice of the IP block and greater accuracy of targeting of the articular branches to the anterior hip capsule aligns with recent endorsements by Yeoh et al. and Nielsen et al. They argued that the IP block is indeed a motor-sparing alternative to PENG.[3,4]

Additionally, your technical description which promotes the visualisation of the IP, femoral head and adjacent musculature with subsequent needle repositioning for intra-articular and trigger point injections indicates a rational use of ultrasonography. In patients with needle phobia or those requiring economic outpatient management, this 'three birds with one stone' approach is attractive.

Nevertheless, further consideration of certain issues is imperative.

First, while the technique may provide short-term analgesia, the issue of concerted, long-term efficacy remains. Large randomised controlled trials and meta-analyses[5] suggest that the benefits of intra-articular corticosteroid injections, such as triamcinolone, tend to peak at two to six weeks and wane thereafter. In their Bayesian network meta-analysis, triamcinolone showed the highest probability of reaching the minimal clinically important difference (MID) for pain relief but only at early timepoints. After three months, the benefits are often indistinguishable from placebo. Correspondingly, the recent HIT trial[6] showed that while corticosteroid plus lidocaine injections did provide meaningful symptom relief at six months when added to education and advice, the degree of subsequent improvement was best in the initial months and most definitive in patients with ultrasound-confirmed synovitis.

Secondly, the use of intra-articular local anaesthetics must be approached with some trepidation. A 2022 review[7] reported that agents like bupivacaine may infer the danger of chondrotoxicity, especially with repeated administration. Likewise, while hyaluronic acid has historically been used as a second-line injectable agent, research[5,8] has regularly reported that its clinical effect on hip OA pain is negligible. Worryingly, it has also been reported to have an increased risk of grave adverse events (odds ratio 1.86; 95% CI 1.2–3.1).

Appropriate patient selection is essential. This technique may be best suited to patients with mild-to-moderate radiological pathology or in incidences where the pain generated is primarily by the anterior capsule or myofascial sources, or when synovitis or an effusion is sonographically apparent. In more destructive joint degeneration, where subchondral collapse, osteophyte burden or complete joint space obliteration is present, the clinical gains may be nominal and may delay surgical referral. As Sato et al.[9] stressed in their case series using PENG blocks, repeated nerve blocks may facilitate mobility and reduce pain, but need dutiful consideration of volume, injection site and dosing, principally to avoid femoral nerve involvement.

The feasibility of subsequent global implementation requires sober consideration. This 3-in1-technique, while technically elegant, demands a clinician familiar with musculoskeletal ultrasonography and well informed on pelvic anatomy to be involved. This could limit its applicability outside of tertiary centres. Training pathways would be required to address this potential restriction. Moreover, the inferred risk of bursal rupture, chondral damage, high injection pressures or misplacement in less experienced clinicians' hands warrant caution.

Finally, we must frame the potential implantation of this technique within the broader management framework for hip OA. Evidence from Sweden[10] reports that patients who respond well to first-line, non-pharmacological care (education and exercise) are significantly less likely to progress to joint replacement (hazard ratio for hip OA 0.4; 95% CI 0.4–0.5). Therefore, any interventional strategy, irrespective of innovation or bespoke selection, should ideally supplement, rather than replace, fundamental conservative modalities.

In conclusion, the proposed 3-in-1 injection method is a thoughtful response to a mounting clinical demand. It is elegantly rooted in anatomical and procedural precision, it attacks multiple sources of hip pain in a single sitting, and may offer a short-term solution while awaiting more definitive management. Nonetheless, we concur that the technique warrants further evaluation potentially through prospective studies. This would better elucidate its durability, safety profile and bearing on surgical timelines. We would encourage you to consider a pilot case series or feasibility study and to evaluate the subsequent objective and patient-reported outcomes over a consequential time period.

We look forward to future updates as this technique evolves.

Yours faithfully

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