

Is the distance between posterior capsule and popliteal artery a limitation for IPACK at the level of femoral condyles?

Femoral kondil düzeyinde posterior kapsül ile popliteal arter arasındaki mesafe, IPACK için bir kısıtlayıcı faktör müdür?

Sandeep Diwan¹, Anju Gupta², Parag Sancheti³

¹Department of Anaesthesiology, Sancheti Hospital, Pune, Maharashtra, India

²Department of Anaesthesiology, Pain Medicine and Critical Care, AIIMS, New Delhi, India

³Chairman and Managing Director, Sancheti Hospital, Pune, Maharashtra, India

The ultrasound-guided infiltration between the posterior of the knee capsule (PKC) and the popliteal artery (PA), commonly known as IPACK, plays a pivotal role in total knee arthroplasty when performed alongside an ultrasound-guided adductor canal block.^[1,2] The precise positioning of the needle between the PKC and the PA at the level of the femoral condyles, followed by an adequate diffusion of injectate, is of utmost importance. Traditionally, the needle is inserted from medial to lateral as it courses between the PKC and the PA (Video 1).

Following institutional ethics committee approval, we investigated the distance between the PKC and the PA at the level of the femoral condyles in a sample of 20 patients, and found a mean distance of 1.2 cm. However, in eight patients (40%), the distance was less than 0.7 cm (Figure 1). This finding is crucial as a distance of less than 0.7 cm may hinder the administration of IPACK, leading to potential complications. In these eight patients, the needle could not be negotiated between the PKC and the PA, and the IPACK was deferred.

Distance between the PKC and the PA would be critical to determine the possibility of administering an IPACK. Thus, a pre-scout scan and evaluation of

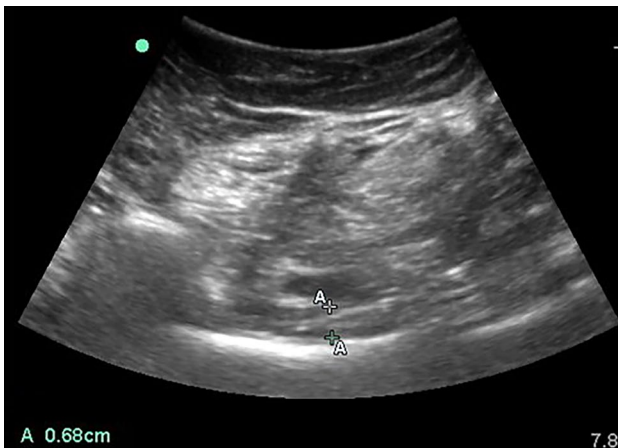


Figure 1. Distance from femoral condyle and popliteal artery.



Video 1. Video of block performance.

Corresponding author: Anju Gupta.

E-mail: dranjugupta2009@rediffmail.com

Doi: 10.5606/agri.2026.73

Received: October 24, 2024 | Accepted: November 24, 2024 | Published online: July 03, 2026

Cite this article as: Diwan S, Gupta A, Sancheti P. Is the distance between posterior capsule and popliteal artery a limitation for IPACK at the level of femoral condyles?. Agri 2026;38(3):208-209. doi: 10.5606/agri.2026.73.

© 2026 The Author(s). This is an open access article published under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, reproduction, and adaptation in any medium, provided the original work is properly cited. <https://creativecommons.org/licenses/by/4.0/>

the distance are of utmost importance. With a shorter distance, the diffusion of local anesthetic toward the sciatic nerve and its branches in the popliteal fossa is imminent, resulting in a possible foot drop. This small sample study stems from the two cases of foot drop that lasted for two to three weeks, following an IPACK with 30 mL 0.1% ropivacaine performed at the level of femoral condyles. In both these cases, we faced difficulty in negotiating the needle toward the target site due to the short distance between PKC and PA (0.62 cm in one patient).

In conclusion, we suggest a pre-scout scan for evaluating the distance between PKC and the PA and assessing needle track and tip positioning. If the distance is less than 0.7 cm, as in our experience, the IPACK can be abandoned at this level and can be administered at the level of the lower femoral shaft (LFS). However, it should be remembered that a cadaveric study demonstrated an anteromedial to posterolateral insertion of the needle at LFS in close approximation to the nerve to vastus medialis and the saphenous nerve.^[3] An alternative technique, such as local infiltration anesthesia and injection into the posterior knee capsule by the surgeon, can be considered. Moreover, the close approximation of the vascular structures should alert the surgeon to the posterior compartment, if necessary. Besides, it may be unnecessary to inject more than 10 mL drug since a cadaveric study revealed staining of the tibial (43%, both proximal and distal approaches) and common peroneal nerves (57% proximal and 71% distal) using 10 mL dye, respectively.^[4] Conversely, following an IPACK, it may be unnecessary for the surgeon to inject into the posterior capsule of the knee capsule. We reckon additional research would be needed regarding the site of needle tip positioning, concentration and volume of local anesthetic to achieve adequate block efficacy without local systemic and neurotoxicity.

Author Contributions

S.D., A.G.: Concept, analysis/interpretation, literature review, writing the article; A.G.: Design; P.S.: Supervision, critical review, materials; S.D.: Data collection; A.G., P.S.: References and fundings.

Conflict of Interest

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The authors received no financial support for the research and/or authorship of this article.

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

AI Disclosure

The authors declare that artificial intelligence (AI) tools were not used, or were used solely for language editing, and had no role in data analysis, interpretation, or the formulation of conclusions. All scientific content, data interpretation, and conclusions are the sole responsibility of the authors. The authors further confirm that AI tools were not used to generate, fabricate, or 'hallucinate' references, and that all references have been carefully verified for accuracy.

REFERENCES

1. Sinha S, Abras J, Sivasenthil D. Use of ultrasound-guided popliteal fossa infiltration to control pain after total knee arthroplasty: a prospective randomized observer-blinded study. ASRA 37th Annual Regional Anesthesia Meeting and Workshops; March 15-18 2012, San Diego, CA: 2012.
2. Chan E, Howle R, Onwochei D, Desai N. Infiltration between the Popliteal Artery and the Capsule of the Knee (IPACK) block in knee surgery: A narrative review. *Reg Anesth Pain Med* 2021;46:784-805. doi: 10.1136/rapm-2021-102681.
3. Tran J, Chan V, Peng P, Agur A. Response to Sebastian et al: the saphenous nerve and iPACK blocks. *Reg Anesth Pain Med* 2020;45:245-6. doi: 10.1136/rapm-2019-100840.
4. Tran J, Giron Arango L, Peng P, Sinha SK, Agur A, Chan V. Evaluation of the iPACK block injectate spread: A cadaveric study. *Reg Anesth Pain Med* 2019;rapm-2018-100355. doi: 10.1136/rapm-2018-100355.