The Tibial Tuberosity–Tibial Intercondylar Midpoint Distance: Response

Authors' Response:

We thank Dr Nizić for the letter. To the tireless researchers whose dedication knows no bounds and whose pursuit of knowledge illuminates the darkest corners of ignorance, we offer our utmost praise and heartfelt blessings. We are thrilled to have this opportunity to interact with experts in our field and thank *OJSM* for giving us this opportunity.

We deeply apologize for any misunderstanding our statements may have caused Dr Nizić and others. The issues raised by Dr Nizić primarily revolve around the source of our measurement data—whether it is preoperative or postoperative. All the measurement data we used in our study[1] were derived exclusively from the preoperative imaging records of patients. Because our study participants were sampled from the inpatient medical records system of hospitals, we described these patients as having undergone surgical treatment. This does not pertain to the establishment of inclusion or exclusion criteria. Regarding the recurrently mentioned procedure of tibial tubercle osteotomy, as articulated in our conclusions, our sole objective was to comprehensively consider the anatomic factors of the knee joint to guide the selection of surgical approach. Therefore, there should be no error in our methods and conclusions.

Initially, in designing our study, based on the study by Nizić et al,[2] we thought that the tibial tuberosity–tibial intercondylar midpoint (TT-TIM) distance would most likely be a completely new anatomic indicator to overrule the tibial tuberosity–trochlear groove distance, and therefore we included TT-TIM in our study. Our measurements did not show a statistical difference in this parameter between the patellar dislocation group and a healthy control group. However, at this time, we do not deny the role of the TT-TIM distance in patellar dislocation. Our study[1] was only a simple comparison between the healthy control group and the patient group, and there was no in-depth study of TT-TIM as an indicator. Even the differences between races are not known. As described in our article, the role of TT-TIM needs further study. Perhaps our study was not sufficiently exhaustive, but we have reported on the genuine phenomena observed.

The TT-TIM distance provides a straightforward representation of the absolute distance of the tibial tubercle relative to the lateralization of the tibial plateau. Because all of its pertinent anatomic landmarks originate from the tibia, as described by Nizić et al,[2] the TT-TIM distance remains unaffected by factors such as knee rotation. However, being an absolute distance measure, the TT-TIM distance is highly correlated with skeletal size. Hence, the TT-TIM distance is likely to be significantly influenced by factors such as age, sex, and skeletal maturity. Objectively, despite there being no overall differences in sex and age among our included patients, skeletal size could not be conclusively determined. When tibial plateau sizes are similar, it is evident that the TT-TIM distance serves as a robust indicator of isolated lateralization of the tibial tubercle. Moreover, in our study, the interobserver reliability of the TT-TIM distance was the lowest among the parameters measured, likely due to variations in tibial plateau delineation by the reviewers. Conversely, the tibial tuberosity lateralization (TTL) ratio is a relative value, circumventing the influence of skeletal size. Although individuals with larger tibial diameters may exhibit smaller TTL ratio, this paradox underscores that tibial tubercle lateralization is relative to skeletal size rather than being an absolute value. In patients with larger skeletons, a slight increase in the absolute distance of lateralization may not necessarily yield pathological effects.

Setting aside the research data, we believe that assessing the lateralization of the tibial tubercle in patients with patellar dislocation necessitates consideration of factors such as knee joint rotation. The lower limb functions as an integrated unit, and isolated risk factors are highly likely to be corrected by other anatomic factors. Pace et al[3] reported that isolated lateralization of the tibial tubercle may not be the primary factor for patellar dislocation. Particularly regarding the remaining anatomic indices, the medialization of the femoral trochlea may indeed play a significant role.[4] Skeletal deformities in patients with patellar dislocation arise from both the femur and the tibia. Therefore, evaluating TTL ratio after incorporating factors of femoral and tibial deformities would be a better choice for predicting the recurrence of patellar dislocation and guiding surgical decisions.

Regardless, the role of the TT-TIM distance in patellar dislocation cannot be defined at this time. Perhaps further subgroup analyses will better elucidate its role in patellar dislocation. We are grateful to Dr Nizić and others for their contributions to this process. In a sense, science may not have absolute rights and wrongs but rather is constantly debated and studied. May the efforts of scientific research have unlimited success, uncover the mystery of the anatomy of patellar dislocation, and pave the way for its improved diagnosis and treatment in the future.

Kehen Li, MMed
Chenyue Xu, MD
Fei Wang, MD
Shijiazhuang, China

The Orthopaedic Journal of Sports Medicine, 12(6), 23259671241260437
DOI: 10.1177/23259671241260437

Address correspondence to Fei Wang, MD (email: doctor wfei@163.com).

The authors have declared that there are no conflicts of interest in the authorship and publication of this contribution. AOSSM checks author disclosures against the Open Payments Database (OPD). AOSSM has not conducted an independent investigation on the OPD and disclaims any liability or responsibility relating thereto.

REFERENCES

1. Li K, Xu C, Dong Z, Ji G, Wang F. Reliability of tibial tubercle–trochlear groove distance for assessing tibial tubercle lateralization: a study comparing different anatomic references. *Orthop J Sports Med*. 2024;12(4):23259671241239965.
2. Nizić D, Šimunović M, Pavliša G, Jelić M. Tibial tuberosity–tibial intercondylar midpoint distance measured on computed tomography scanner is not biased during knee rotation and could be clinically more relevant than current measurement systems. *Int Orthop*. 2021;45(4):959-970.
3. Pace JL, Drummond M, Brimacombe M, et al. Unpacking the tibial tubercle–trochlear groove distance: evaluation of rotational factors, trochlear groove and tibial tubercle position, and role of trochlear dysplasia. *Am J Sports Med*. 2023;51(1):16-24.
4. Paiva M, Blønd L, Hölmich P, Barfod KW. Effect of medialization of the trochlear groove and lateralization of the tibial tubercle on TT-TG distance: a cross-sectional study of dysplastic and nondysplastic knees. *Am J Sports Med*. 2021;49(4):970-974.