

Pure and Mixed Imaging Tests, Precision, and Sex Dependence in Patellofemoral Imaging: Response

Authors' Response:

We thank Dr Nizić for his interest for our recently published study.⁶ The tibial tubercle–Roman arch (TT-RA) distance has landmarks on the tibia and femur. Therefore, the translation of the tibia or the rotation of knee joints would alter the value of TT-RA distance. We have also performed studies to investigate the difference in the TT-RA distance between CT and MRI.⁴ We found that the value of TT-RA distance is affected by the rotation or flexion of the knee joint, which is also the case for the current gold standard tibial tubercle–trochlear groove (TT-TG) distance.^{1,4,6} Therefore, the TT-RA distance is a mixed imaging test.

We do agree with Dr Nizić that a test of tibial tuberosity lateralization that is independent of femorotibial rotation may be a more reliable assessment. Some measurements such as tibial tuberosity–tibial intercondylar midpoint (TT-TIM) distance,² or tibial tubercle–posterior cruciate ligament (TT-PCL) distance³ can evaluate pure tibial tubercle lateralization. However, the clinical value of these measurements remains uncertain. TT-PCL distance reflects the true lateralization of the tibial tubercle, and the TT-TG distance reflects the mixed tibial tubercle lateralization. We compared the clinical application value between TT-TG and TT-PCL distance in our previously published study and found the difference in the TT-PCL distance between patients with patellar dislocation and healthy controls to be only 1.11 mm.⁵ In addition, the TT-PCL distance was found to have a poor capacity to predict patellar dislocation (area under the receiver operating curve [AUC] = 0.627). Therefore, the role of true tibial tubercle lateralization in the evaluation of patellar dislocation patients warrants further assessment. As mixed imaging tests, the TT-RA distance (AUC = 0.8) and TT-TG distance (AUC = 0.8) had higher capacity than TT-PCL distance (AUC = 0.6) to distinguish patients with patellar dislocation from healthy individuals,^{5,6} which indicate that the mixed imaging tests would be more suitable to evaluate patellar dislocation.

As for the question of the accuracy of the TT-RA distance. We used the intraclass correlation coefficient to evaluate the precision of the measurements, and found that the TT-RA distance showed higher inter- and intraobserver reliability than the TT-TG distance (Table 2 of our study⁶),

especially in patients with patellar dislocation (Figure 6 of our study⁶). When regarding the precision of TT-RA distance to distinguish patellar dislocation patients from healthy individuals, the AUC was comparable to that of the TT-TG distance (Figure 8 of our study⁶).

The sex difference of TT-RA distance was not investigated in the present study. It is hard to determine any sex-based differences in the TT-RA distance with a small sample size.

Thank you for your kind thoughts and interest.

Zijie Xu, MD
Pei Zhao, MD
Yi-Fan Song, MD
Hai-Jun Wang, MD
Aiguo Zhou, MD
Jia-Kuo Yu, MD
Beijing, PR China

Address correspondence to Jia-Kuo Yu, MD (email: yujiakuo@126.com).

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