

Highly variable tibial tubercle-trochlear groove distance (TT-TG) in osteoarthritic knees should be considered when performing TKA

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PURPOSE

The tibial tubercle-trochlear groove distance (TT-TG) is an established measurement to assist diagnosis and treatment of patellofemoral instability. However, little is known about the distribution of TT-TG in osteoarthritic knees. The purpose of the current study is to investigate the TT-TG in a large cohort of osteoarthritic knees and to analyse, in particular, the association of knee alignment and TT-TG.

METHODS

Data from 962 consecutive patients [455 male, 507 female; mean age \pm SD 70.8 ± 9.3 (37-96)] who had undergone 3D-CT and preoperative knee planning with validated commercial 3D planning software before total knee arthroplasty (TKA) were collected prospectively. The TT-TG, coronal hip knee angle (HKA), femoral anteversion (AVF), external tibial torsion (ETT), and femorotibial rotation (Rot FT) were analysed. Pearson correlations were performed to assess correlations between TT-TG, mechanical axis, and rotational parameters ($p < 0.05$).

RESULTS

HKA showed a strong correlation with TT-TG ($r = 0.488$; $p < 0.001$) with 98 (67.1%) and 45 (30.8%) of valgus knees having respective abnormal and pathological TT-TG values. There were no significant correlations between parameters of rotational alignment (AVF, ETT, Rot FT) and TT-TG. Mean TT-TG was 12.9 ± 5.6 mm, ranging from 0.0 to 33.7 mm. 325 (33.8%) of all patients had abnormal (> 15 mm) and 101 (10.5%) had pathological (> 20 mm) values. A varus alignment was present in 716 (74.4%) of the cases ($HKA < -1.5^\circ$), a neutral alignment in 100 (10.4%), and a valgus alignment in 146 (15.2%) ($HKA > 1.5^\circ$).

CONCLUSION

A wide variation of TT-TG values in osteoarthritic knees was shown by our results. There was a relevant influence of coronal limb alignment on the TT-TG—the more valgus the higher and more pathological the TT-TG. With the aim of having a more personalised TKA, the individual TT-TG should be taken into

account to improve the outcome.

LEVEL OF CLINICAL EVIDENCE

III. Retrospective cohort study.

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