

Healthy knees have a highly variable patellofemoral alignment: a systematic review

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PURPOSE

There is still lack of knowledge regarding the variability of patellofemoral alignment in healthy, non-osteoarthritic knees, without patellofemoral instability. Therefore, a systematic review of the existing literature was performed to evaluate the variability of patellofemoral alignment.

METHODS

Patellofemoral alignment of the knee was defined by the following parameters: sulcus angle (SA), femoral trochlear depth (FTD), patellar tilt angle (PTA), lateral patellofemoral angle (LPFA), lateral femoral trochlear inclination (LFTI) and tibial tubercle-trochlear groove distance (TT-TG). The electronic databases MEDLINE and EMBASE were searched from database inception to search date (January 11, 2019) and screened for relevant studies. The PRISMA guidelines were followed. Articles reporting PF alignment measurements of healthy knees in patients between 15 years and 47 years were included.

RESULTS

A total of 15 studies met the inclusion criteria. The studies reported mean values and standard deviations for the SA between $118.7^\circ \pm 7$ and 168° ; for the FTD between $3.4 \text{ mm} \pm 1.1$ and $7.1 \text{ mm} \pm 1.8$; for the PTA between $0.7^\circ \pm 4.99$ and $17.05^\circ \pm 4.3$; for the LPFA between $6.26^\circ \pm 4.1$ and $11.1^\circ \pm 4.0$; for the LFTI between $16.3^\circ \pm 2.8$ and $22.1^\circ \pm 1.9$; and for the TT-TG between $9.8 \text{ mm} \pm 4.6$ and $17.3 \text{ mm} \pm 5.3$.

CONCLUSION

Patellofemoral alignment in the healthy knee is extremely variable. A more precise knowledge of the complex relationship between the patella and the trochlea may help to better diagnose PF disorders and eventually help in selecting the correct therapy. Furthermore, standardised imaging protocols and measurement techniques for patellofemoral parameters are needed.

LEVEL OF EVIDENCE

III.

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