

Osteoarthritis and Cartilage



Letter to the Editor

What information must measures provide to demonstrate the problems in knee alignment and osteoarthritis?

Dear Editor,

Chang *et al.*¹, show, with some elegant illustrations, some important limitations in estimating the Mechanical Axis (MA) of osteoarthritis (OA) knees using anatomical shaft data. Our observations are closely aligned².

Chang *et al.*¹ suggest that the tibial femoral angle (TFA) calculated using the points bisecting the long bones 15 cm (TFA2) rather than 10 cm (TFA1) from the knee joint does a better job as a reference for MA. We agree with the *proviso* that limitations are still evident when using the marginally revealed anatomy of a 17-inch cassette, better in women (smaller frames) than men. The smaller stature of Koreans may favor their findings. Suffice to say, that the greater amount of shaft defined on the film the better, and the best is full length.

The authors also noted the statistically significant contribution of femoral geometry to the varus in the OA cases, described and illustrated by them as lateral femoral bowing. We feel that this is important as it reinforces the question... "Where does the varus (or valgus deformity) come from?", and "Is there deformity in the shape of the femur or tibia, or are both risk factors?" All the methods that employ less than full-length images of the limb will fall short of giving answers to these and other similar questions. Our observations on femoral varus (lateral bowing) as a contribution to the varus OA knee were evident across North American and Middle Eastern populations³. But valgus deformity patterns, presenting in about a third of a Canadian sample, were very limited in the Middle East. We suspect similar disparate representation in the Far East. Does this suggest genetic and or ethnic factors to be in play for valgus knee OA?

Thus, we reiterate that if the question is to define the role that alignment plays in knee OA, then full-length images are needed. Estimating the MA using the TFA will be misleading unless the characteristics of the population or individual are kept in mind. Unfortunately, we still lack information on foot and ankle deformities in the coronal plane and slope and bone geometry issues at the knee in the sagittal plane, information we need to better understand the roles they may play.

Again we commend Chang *et al.* for a study well done, and the support it gives to improving our methods to better answer these questions on bone and other joint contributions to knee OA.

Contributions

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Disclosure

Dr Cooke is president and principle shareholder of OASYS Inc, a medical device company specializing in measurements of radiographic images.

References

1. Chang CB, Choi JY, Koh IJ, Seo ES, Seong SC, Kim TK. What should be considered in using standard knee radiographs to estimate mechanical alignment of the knee? *Osteoarthritis Cartilage* 2010 Apr;18(4):530–8.
2. Sheehy L, Felson D, Cooke TDV. Is the femoral shaft–tibial shaft angle a reliable substitute for the hip–knee–ankle angle in knee osteoarthritis? *Osteoarthritis Cartilage* 2009;17(Suppl 1):S207.
3. Cooke TD, Harrison L, Khan B, Scudamore A, Chaudhary MA. Analysis of limb alignment in the pathogenesis of osteoarthritis: a comparison of Saudi Arabian and Canadian cases. *Rheumatol Int* 2002 Aug;22(4):160–4.

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