

LETTER TO THE EDITOR

Distal Femoral Valgus Cut Errors in Total Knee Replacement

Dear Editor

The causes of coronal malalignment in total knee arthroplasty can be categorized into three different groups; 1) Errors in bone cuts 2) Errors in implant fixations, and 3) The method of setting down the cutting guides (1). We would like to announce that more several distal femoral valgus cut errors may occur during total knee replacement.

Based on the literature, a marginal limit of 3 degrees of error in frontal joint line orientation angle is acceptable and will not affect prosthetic joint survival (2-4). Outliers are expected to encounter problems in terms of earlier loosening, more pain, wear and subsidence which may eventually result in revision (2, 5, 6).

To achieve normal mechanical axis, the errors in distal femoral valgus cut should be given specific attention to be minimized. In regard with the recently published study data by Maurin Lampard et. al. applying fixed hip knee shaft angle for alignment of the distal cut leads to significant error in coronal TKA alignment because of great variability and asymmetry of distal femoral anatomy (1). Mont and Arquhart et.al showed that even experienced surgeons may make errors (50% > 1 degree and 38% > 2 degrees of error) and may need to recut (7). Navigation can help reducing the errors but recent studies showed that it is not flawless (8).

Stephen C. Reed et.al cautioned about first (distal entry point) and second (proximal intramedullary guide rod deviation) errors of femoral valgus cut (9). Other possible causes of errors are: cutting block design, implant fixation, bone density, saw blade quality and using fixed distal femoral cutting angle (1, 4, 10, 11).

In addition to the all of the above-mentioned errors that may result in malalignment, three other errors should be considered:

1) Measurement errors: including preoperative long leg radiographic angles and intraoperative bone-cut

thickness

2) Reference-Axis based errors: According to a recently published study, the valgus cut angle is different when using distal femoral anatomic axis rather than whole femur anatomic axis. The authors suggested to adjust the valgus cut angle based on the intramedullary guide length (12).

3) Size of the entry point hole may affect the position of intramedullary guide rod as well as the first and second errors.

To decrease all possible errors we recommend meticulous preoperative and intraoperative measurements and using precise cutting instruments. Likewise, the accurate location and size of the entry point as well as the appropriate diameter and lengths of the intramedullary guide rod is of great significance. In addition to these considerations, the surgeon should adjust the femur valgus cut angle at the time of surgery based on intraoperative limb alignment. While the femur distal cut thickness needs to be adjusted in consideration of preoperative long leg radiographic measurement angles.

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