Editorial Commentary: Chronological Age Is Not Associated With Adverse Postoperative Outcomes After High Tibial Osteotomy: Contradiction of Another Dogma From the Past

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Abstract: Open wedge high tibial osteotomy (OWHTO) is an established treatment option for treating medial compartmental knee osteoarthritis with varus deformity. Among several factors associated with postoperative outcomes, patient age is immensely decisive in reconstructive knee joint surgeries, including OWHTO and total knee arthroplasty. Surprisingly, the direct effect of age on OWHTO outcomes is poorly defined in current clinical practice. Recent research comparing clinical and radiologic outcomes according to age was introduced, and the influential predictor determining OWHTO outcomes was cartilage status rather than age. In the future, when deciding its suitability, OWHTO should absolutely be considered as an attractive treatment even in elderly patients without highly advanced cartilage degeneration; advanced age should not be identified as a risk factor but rather a potential indication for OWHTO. However, a large-scale long-term follow-up study is necessary to elucidate these findings.

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Open wedge high tibial osteotomy (OWHTO) is an effective surgical procedure for the treatment of medial compartment osteoarthritis of the knee and for correction of lower extremity malalignment.[1-3] Numerous clinical studies have demonstrated good and satisfactory outcomes with HTO[4-6]; however, questions remain regarding potential factors that lead to deteriorating outcomes over time.[7,8] One such question is whether patient age leads to poor outcomes or survival, and the question has become more relevant with population aging and increased demand for the retention of native knee joints. Orthopaedic surgeons face a dilemma when treating patients showing discrepancies between cartilage status and age. Prior studies of the influence of patient age on outcomes after OWHTO have demonstrated controversial results owing to uncontrolled cartilage status[9-12]; thus the effect of chronological age on postoperative outcomes is unclear.

The study by Song, Kim, Lee, and Bin,[13] "Cartilage Status, Rather Than Chronologic Age, Determines the Outcomes of Open Wedge High Tibial Osteotomy: A Cartilage Status–Matched Cohort Study," retrospectively assessed the true effects of chronological age on clinical and radiological outcomes of OWHTO after propensity score matching on the basis of cartilage status in the medial and lateral compartments during arthroscopy. The authors reviewed 107 cases and concluded that advanced age was not associated with adverse outcomes after OWHTO when cartilage status was controlled.

Recent clinical studies have demonstrated no association between age and outcomes after OWHTO.[9,12] Goshima et al.[9] found that age did not influence the clinical and radiological outcomes of OWHTO in a simple comparison of two groups that were divided using a cut-off age of 65 years. Floerkemeier et al.,[12] in their multicenter case series, aimed to identify predictive parameters for outcomes after OWHTO and found no correlation between patient age and clinical outcomes. Likewise, the current study by Song et al.[13] demonstrated that clinical outcomes in terms of Hospital for Special Surgery scores and Knee Society (KS) objective and functional scores after OWHTO were influenced by cartilage status rather than by age itself.

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Moreover, they found no differences in medial joint space width, a radiologic parameter representative of cartilage degeneration, between the groups regardless of cartilage matching status.

In contrast, several studies have described a negative age-dependent effect on OWHTO outcomes. We have published a study that evaluated survival rates and analyzed factors that affect these rates after OWHTO.[10] In that series, OWHTO provided satisfactory clinical outcomes and survival (87.1% at 10 years and 85.3% at 13 years) for patients with medial knee osteoarthritis. We have also presented a regression analysis showing that age ≥65 years, grade 4 cartilage damage in the medial compartment, and grade ≥2 cartilage damage in the lateral compartment appear to negatively influence outcomes and survival after OWHTO. In fact, in our approach, due to various factors, we were unable to decide whether to perform OWHTO or total knee arthroplasty (TKA) in cases with elderly patients. Bonasia et al.[5] reported that age >56 years was related to inferior OWHTO outcomes in a simple regression analysis. As pointed out by Song et al.,[13] those studies did not address the confounding effect of cartilage status, which should be controlled for accurate analysis of the true effects of age on postoperative outcomes.

We agree with the authors' statement that the time point of conversion to TKA tends to be applied unevenly to patients of different ages. Hence, we defined failure as conversion to TKA or KS score <60 points in our previous study.[10] Assessing postoperative outcomes based on patient-reported outcomes might allow orthopaedic surgeons to determine whether this procedure is reliable and effective even in elderly patients.

As indicated by the authors, the limitations of the current study, including its small sample size relative to those in other published articles and the potential danger in drawing strong conclusions because of unmatched or uncontrolled variables (female sex, range of motion, and preexisting patellofemoral joint), are certainly a concern. Despite these factors, this cartilage status-matched cohort study along with its comparison of clinical and radiologic outcomes according to age provide further evidence to allay clinical concerns of performing OWHTO in cases with advanced chronological age. Certainly, as the authors assert in their final sentence, chronological age should not be considered a risk factor for OWHTO but rather a potential indication when treating elderly patients without highly advanced cartilage degeneration. In the future, a large-scale long-term follow-up study is necessary to elucidate this further.

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