***CORR* Insights®: Causes, Risk Factors, and Trends in Failures After TKA in Korea Over the Past 5 Years: A Multicenter Study**

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Where Are We Now?

Although TKA is successful for most patients, the likelihood of failure increases in time [1, 2]. The major causes of TKA failure include infection, loosening, wear, instability, and stiffness [6, 10]. It is important to understand the causes and frequencies of these failure mechanisms in order to have a chance to minimize them.

A prosthesis developed to fit Westerners' features can cause a unique pattern of failure after TKA [5, 7] in Asian patients whose anthropomorphic features and differing demographic characteristics (predominantly varus deformity and a floor-based lifestyle) place different demands on the fixation interfaces. This raises the question of whether—

in a large population of TKAs in Asian patients—there might be differences in the failure mechanisms that we see. Koh and colleagues performed a retrospective multicenter study to determine the causes, risk factors, and trends in failure after TKA in Korea. After a comprehensive analysis of voluminous data, Koh and colleagues concluded that the causes of failure and demographic risk factors in Korea were similar to those in Western countries. They also reported that infection was the most common cause of failure, but that loosening had emerged as a common cause in recent years. However, several questions about their methodology and the evidence remain; including numerous potential biases from use of heterogeneous materials, appropriate timing of evaluation of the longevity of prostheses, and the representativeness of a small ethnic group.

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Where Do We Need To Go?

The longevity of the prosthesis after TKA depends on various factors, such as patient-, prosthesis-, and surgical technique-related variables. Although age was found to be a major risk factor in TKA failure in the present study, we are concerned about over-simplification of the analysis when only patient demographic factors are considered. The analysis also showed a higher incidence of infection in males with no evidence of any cause. It could be expected that the posttraumatic osteoarthritis and previous ligament injury are more frequent in males. Therefore, the constrained knee prosthesis could be used more frequently in males. These confounding variables—including preoperative diagnosis and type of prosthesis—should be taken into account in future studies to determine the reason(s) why males had a higher incidence of infection. Confounding variables should be anticipated and addressed. Most studies

[4, 8, 10] examining the causes of failure after primary TKA have been retrospective reviews of all patients who underwent revision TKA during specific periods at specific institutions. However, they are likely to be influenced by various biases, perhaps including different revision indications for each surgeon, the referring level of the hospital, and the interval between primary and revision TKAs. In an analysis of cumulative failure incidence, it is difficult to avoid evaluating time-dependent effects on the longevity of the prostheses. The population may include cases with earlier-generation prosthesis designs, which may not be relevant to estimating current causes of failure. The present study also reports that the incidence of loosening has recently increased in Korea, which may be associated with a high rate of early femoral component loosening associated with high-flexion prostheses [3, 5]. However, an appropriately focused study is necessary to determine the reason(s) for the apparent recent increase in loosening.

How Do We Get There?

Prospective controlled trials from national registry cohorts will help determine the causes of TKA failure, and reduce potential biases. Such studies provide important information, and will help us assess significant associations between causes of failure and risk factors. Researchers will be able to systematically assess the impact of patient-, prosthesis-, and surgical technique-related variables in well-organized subgroups. Analyses of survival rates of prostheses, and comparisons according to the variables will facilitate identification of time-dependent effects on the longevity of prostheses [1, 9]. Conclusions from a multinational study would be generalizable to various national populations or may reveal unique characteristics that are not generalizable. Fortunately, the recent standardization [6] of causes of failure after TKA will facilitate evaluation of nationwide outcomes and comparisons of international collaborative registry cohorts. This should also assist us in overcoming the small ethnic group representation issue through comparisons with larger ethnic groups.

Researchers should evaluate the recent increase in loosening incidences [5] carefully to determine the reasons, because many factors play a role in component fixation, including the quality of host bone, the surface area for cementation, cement technique, prosthesis design, and patient activity. A detailed analysis of loosening types based on each component, and comparisons with other ethnic cohorts will provide a better understanding of the observed recent tendency towards loosening in Korea.

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