



Development of a Modern Knee Society Radiographic Evaluation System and Methodology for Total Knee Arthroplasty



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ABSTRACT

To accompany the new clinical Knee Society Score, a committee was formed to develop an updated radiographic assessment and evaluation system. The purpose is to accumulate radiographic data in a standardized manner to facilitate more accurate interpretation, documentation and clinical correlation. We systematically reviewed the TKA radiographic evaluation literature as well as the original Knee Society Radiographic Evaluation and Scoring System. A modern system was developed, approved by the Knee Society membership, which ensured proper radiographic documentation of coronal and sagittal implant alignment, fixation interface integrity with respect to radiolucent lines and osteolysis, and a zonal classification system to document precise deficiency locations. It is hoped that data may be accumulated in a standardized manner with eventual formulation of implant risk “criteria” or “scores”.

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In 1989, the original Knee Society Clinical Rating System was developed to assess the clinical and functional status of patients after total knee arthroplasty (TKA) [1]. It was accompanied by a radiographic evaluation and scoring method published in the same year [2]. Recently, a new Knee Society Scoring System was developed to objectively evaluate patients with TKA clinically with respect to function, expectations, pain and satisfaction. The purpose of creating the new scoring system was to modernize this outcome measure with greater utility, sensitivity and validity in contemporary knee arthroplasty patients, who have increasing physical demands and activities [3,4]. Subsequently, a modernized and updated radiographic evaluation system for total knee arthroplasty was necessary, particularly in light of the diverse and complex variety of knee designs that have emerged over the past 25 years.

Due to the increase in primary and revision knee arthroplasty surgery that is projected to occur [5], it is essential to develop a consistent

and standardized methodology to obtain and perform a radiographic evaluation of these procedures. When compared to the original Knee Society Scoring system [2], a newer practical approach was needed to be established to update and standardize guidelines for the specific radiographs to be obtained, the techniques used to obtain them, and the methods for evaluation and reporting upon the status of the implants. Due to the lack of studies with sufficient statistical power to correlate specific radiographic findings with outcomes, as well as the numerous implant designs, it was beyond the scope of this system to define specific x-ray parameter values that would deem implants as “normal”, “abnormal” or “at-risk.” Rather, it is proposed that this radiographic evaluation system be used to accumulate radiographic data in a standardized manner in order to facilitate more accurate x-ray interpretation, documentation and clinical correlation. In addition to primary TKA implants, schematics and methodology are provided for the evaluation of revision knee arthroplasty systems.

Methods

A committee of six Knee Society members was formed with the specific task of developing an updated radiographic assessment and evaluation system. The committee was composed of knee arthroplasty

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