

The Use of Intraoperative Sensors Significantly Increases the Patient-Reported Rate of Improvement in Primary TKA

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Summary:

At 6-month follow-up interval, patients in receipt of a sensor-assisted TKA reported greater improvement in function and less pain than the patients in the manual TKA group.

Abstract:

One out of every five total knee arthroplasty (TKA) recipients is unhappy with the outcome of their surgery. As the number of TKA candidates continues to increase, so, too, will the dissatisfied patient population. These statistics should not be acceptable to the surgeons, hospitals, and patients implicated in this elective procedure. There are many contributing factors to patient dissatisfaction, paramount among them being post-operative levels of functionality and pain. Therefore, in an attempt to increase function and decrease pain levels through soft-tissue management, sensor-assisted TKA outcomes were compared with manual TKA outcomes.

One hundred and fourteen primary TKA patients were evaluated: 57 sensor-assisted TKA patients; 57 manual TKA patients. All procedures were performed by the same surgeon. In order to reduce confounding variables, all patients were matched for: age, gender distribution, BMI, marital status, smoking proclivity, pre-operative ROM, pre-operative alignment, and employment status. Outcomes scores were captured pre-operatively, and at the 6-month interval, including Knee Society Score metrics and the Oxford score, as well as 6-month ROM. The sensor device used in this analysis is inserted into the tibial component, during the trialing, and displays loading values in the medial and lateral compartments (lbf.), and also displays the medial and lateral center of load location. In the sensor-assisted TKA group, balance was achieved for all patients, as previously described in literature.

There was a statistically significant rate of improvement, for all outcomes measures, in the sensor-assisted TKA group when compared with the manual group. In addition to rate of improvement, there was also a significant trend towards a significance in ROM in the sensor-assisted group, as a stand-alone dependent variable ($P = 0.002$).

By the 6-month follow-up interval, patients in receipt of a sensor-assisted TKA reported greater improvement in function and less pain than the patients in the manual TKA group. This data suggests that soft-tissue balance may contribute to faster recovery, as reported by the patient. Because pain and function play an integral role in patient satisfaction, further follow-up might yield higher satisfaction in the sensor-assisted patient group, which is consistent with previously published observations.