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Association between tibial coronal alignment in total knee arthroplasty and patient satisfaction: Using a 3D-matching evaluation method

Kazushige Seki

Yamaguchi University, Japan

Purpose: The aim of the present study was to evaluate tibial coronal alignment using 3D-reconstructed computed tomography (CT) scans and assess the relationship between total knee arthroplasty (TKA) alignment and clinical outcome.

Methods: A total of 53 consecutive patients who underwent primary TKA were included in the present study. For the assessment of TKA component positioning, we used a 3D matching evaluation method. In this method, preoperative planning was accomplished using 3D templates. We also performed CT scans of the lower limbs both pre- and postoperatively. The tibial component setting was located and evaluated after surgery using evaluation software made in LEXI Company. For clinical outcome scoring, the Japanese Knee Osteoarthritis Measure (JKOM) was used at 6-months and 1- and 2-years postoperatively. Patients were asked to grade their level of satisfaction for each question (i.e. 'very dissatisfied', 'dissatisfied', 'neutral', 'satisfied' or 'very satisfied').

The patients were divided into two groups: A neutral alignment group (n = 42; preoperative alignment $\pm 2^\circ$), and an outlier group (n = 11; preoperative alignment $> 2^\circ$). We compared these two groups for JKOM level of satisfaction and investigated the correlations between alignment variables and JKOM. Results: There was a significant difference in the number of patients who answered 'satisfied' or 'very satisfied' between the two groups (88.1% in the neutral alignment group vs. 36.4% in the outlier group, $p = 0.0003$). There was also a significant difference in JKOM scores between the two groups (24.4 ± 17.3 in the neutral alignment group vs. 34.9 ± 26.8 in the outlier group, $p < 0.0227$). The Pearson correlation coefficient between tibial coronal alignment and JKOM score was significant ($r = 0.2994$, $p = 0.0294$). Conclusion: Significantly inferior outcomes were detected in the tibial alignment outlier group.

Recent Publications

1. Akai M (2005) An outcome measure for Japanese people with knee osteoarthritis. *The Journal of Rheumatology*; 32:1524-1532.
2. Bourne RB (2010) Patient satisfaction after total knee arthroplasty: who is satisfied and who is not? *Clin Orthop Relat Res*; 468:57-63.
3. Hirschmann MT (2011) The position and orientation of total knee replacement components: a comparison of conventional radiographs, transverse 2D-CT slices and 3D-CT reconstruction. *J Bone Joint Surg Br*; 93:629-633
4. Matsuda S (2013) Postoperative Alignment and ROM Affect Patient Satisfaction After TKA. *Clin Orthop Relat Res*; 471:127-133.
5. Anderl W (2016) Patient-specific instrumentation improved mechanical alignment, while early clinical outcome was comparable to conventional instrumentation in TKA. *Knee Surg Sports Traumatol Arthrosc*; 24:102- 111.

Biography

Kazushige Seki is an expert in knee surgery. He has a strong passion for improving postoperative performance of total knee arthroplasty (TKA). His research on the usefulness combination of three-dimensional template and portable navigation system in TKA has been presented at the several international conferences. And now, he is researching the relationship between patient satisfaction and postoperative alignment of TKA. It is a useful study to improve the postoperative performance of TKA.

Notes:

sk0105@yamaguchi-u.ac.jp