ISAKOS

International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine

10th Biennial ISAKOS Congress • June 7-11, 2015 • Lyon, France

Paper #167

The Significance of Alignment in Knee Flexion Position During Navigation-Assisted Total Knee Arthroplasty

Jae-Hyuk Yang, MD, PhD, KOREA
Jung-Ro Yoon, MD, PhD, KOREA

Veterance Health Service Medical Center
Seoul, KOREA

Summary:
Identifying the alignment in knee flexion position is important during total knee arthroplasty. However, this can only be achieved by use of navigation assisted surgery. Knowing the correlative variables with the knee flexion alignment is also important because these may be the controllable factors for alignment in knee flexion position after total knee arthroplasty.

Abstract:
BACKGROUND
No objective data were reported in the literature regarding the alignment in flexion knee position and the possible predictive parameters during total knee arthroplasty.

PURPOSE
The aim of this study focused on two parts. First was to demonstrate the range of lower limb alignment in knee flexion position after navigation-assisted total knee arthroplasty using the gap technique. Second was to identify the correlative factors which determine the lower limb alignment in knee flexion position.

STUDY DESIGN: Cross-Sectional Study

METHODS
One hundred and twenty consecutive osteoarthritic knees (120 patients) were prospectively enrolled for intraoperative data collection. All TKA surgeries were performed using the navigation system (OrthoPilotTM, version 4.0; B. Braun Aesculap, Tuttlingen, Germany). Before and after final prosthesis implantation, the lower limb navigation alignment in both knee extension (0°) and knee flexion (90°) position were recorded. The knee flexion alignment was divided into 3 groups: varus, neutral and valgus alignment. To determine the factors of the alignment in flexion knee position; preoperative demographics, radiologic and intraoperative obtained data were obtained. Pearson correlation (r) analysis was performed to find the correlation. The Knee Society Score and Western Ontario and McMaster Universities Osteoarthritis Index were compared between groups.

RESULTS
Although all postoperative extension alignment was within neutral position (between -2°and+2°), postoperative knee flexion alignment was divided into three groups: varus (=-3°); 24 cases (20%), neutral (between -2°and+2°); 85 cases (70.8%) and valgus (=+3°) alignment; 11 cases (9.2%). There were good correlation of alignment in knee flexion position with the rotation of femoral component relative from posterior condylar axis (r=-0.502, p=0.000) and weak correlations with distal femoral cut thickness (medial)(r=-0.230, p=0.013), posterior femoral cut thickness (lateral condyle)(r=0.207, p=0.026), medial flexion (90°) gap after femoral component rotation adjustment (r=0.276, p=0.003). There was no correlation with the clinical epicondylar axis. Other variables did neither show correlations. There were no statistical clinical differences between varus, neutral and valgus knee flexion alignment groups.

CONCLUSION
There were variable ranges of lower limb alignment (varus, neutral and valgus) in knee flexion position although

acceptable knee extension alignment was achieved. The knee flexion alignment had a good correlation with the rotation of femoral component relative from posterior condylar axis.