Comparison of alignment unicompartmental knee replacement using conventional non-navigation technique with computer-assisted navigation technique

PINK M, VALOUSEK T, MIKLAS M

Orthopaedic Department, Hospital Trebic, Czech Republic

MPink@nem-tr.cz

Purpose: The aim of our study was to compare the radiographic alignment unicompartmental knee replacement with using conventional non-navigation technique and computer-assisted navigation technique. Our study was focused on bearing alignment on clinical outcome of knee.

Unicompartmental knee arthroplasty (UKA) is conservative alternative to total knee replacement when only one compartment of the knee is affected. The rate of implantation medial and lateral unicompartmental knee replacement is 10:1.

The advantage of implantation UKA is minimally invasive operating approach, lower blood loss, decrease length of hospitalization and reduction of postoperative rehabilitation.

We can perform implantation UKA conventional non-navigation technique and computer-assisted navigation technique. Kinematic navigation reduces the possibility of surgeon mistake, enables more exact alignment of the femoral and tibial component, optimizes resection level and implant size.

Method: In our department we have performed between January 2005 and December 2012 106 computer assisted surgery UKA. All patients were examined before operation clinically and radiologically. Clinical examination was evaluated according to rating system: The Knee Society Clinical Rating System. There were implanted two types of UKA, 67 of UKA were performed by The PRESERVATION™ (DePuy) with using computer-assisted navigation (CI KOLIBRI) and 39 UKA Oxford® Partial Knee (Biomet.) were performed by conventional non-navigation technique.

During this term we performed UKA 103 patients, in three cases there was bilateral implantation. From total number of 106 UKA there were 104 medial and 2 lateral.

Everyone performing UKA was recruited on the base of indication criteria. Among indication criteria for UKA are included osteoarthritis limited to one compartment, a functional anterior cruciate ligament. Contraindication criteria are flexion contracture, restriction of ROM, distinct varus or valgus deformity, osteoartrosis both compartments, inflammatory disease.

Relative contraindication UKA is age and obesity.

In our study we have evaluated 104 of medial UKA divided to groups, 65 implantation of The PRESERVATION™ and 39 implantation of Oxford® Partial Knee. We have evaluated 101 patients, 61 women, 40 men, average age 66,5 (50 – 82) years. BMI mean was 27 (20 – 39).

Firstly we performed measurement of parameters determine alignment unicompartmental knee replacement. These measured values were written down and the deviation of norm was established. Results were divided in two groups, one with values of normal range and the second beyond normal range. Alignment values of all UKA were matched with clinical outcome postoperatively. This assessment was performed by The Knee Society Clinical Rating System.

This working procedure was used for both groups. We asked whether kinematic navigation would affect clinical outcome in comparison conventional non-navigation technique.
**Results:** The mean follow-up was 3.3 (max. 7.1) years. All UKA were evaluated according to The Knee Society Clinical Rating System. The group with computer-assisted navigation technique Knee score improved from mean 58 (41 – 79) preoperatively to 93 (62 – 100) postoperatively. Conventional UKA Knee score improved from 56 (39 - 77) preoperatively to 91 (61 – 100) postoperatively. Clinical outcome is comparable in both groups.

Radiological assessment of alignment unicompartmental knee replacement according to our measurement results in favour of computer-assisted navigation.

**Conclusions:** Computer-assisted navigation UKA enables more exact alignment of the femoral and tibial component than conventional non-navigation technique. In spite of the fact that difference clinical outcome is comparable.