

# Combining different rotational alignment axes with navigation may reduce the need for lateral retinacular release in total knee arthroplasty

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## Abstract

**Purpose** The aim of the study was to compare femoropatellar alignment and the incidence of lateral retinacular release (LRR) in total knee arthroplasty (TKA) in which the rotational alignment of the femoral component was determined using a combination of different rotational alignment axes and navigation or a single reference axis in the standard procedure.

**Methods** We assessed 66 patients undergoing TKA in whom the rotation of the femoral component was determined on the posterior condylar axis in standard procedures (group A) and 65 patients in whom it was determined by combining the posterior condylar axis, anteroposterior axis and epicondylar axis in navigated procedures (group B). The mean age was 68 and 69 years in groups A and B, respectively. Patellar tracking was assessed after deflation of the tourniquet and LRR performed in the presence of maltracking. Visual analogue scale (VAS), Knee Society Score (KSS), Lonner patellar score and patellar tilt were recorded. **Results** LRR was carried out in 18 cases (27 %) in group A and in four (6 %) in group B ( $p=0.003$ ). The KSS and VAS were improved significantly compared to the preoperative status, but with no significant differences between the two groups. The patellar score showed a greater improvement in the navigated compared to the standard group at the four week follow-up. Patella tilt improved significantly in both groups. The complication rate was similar in the two groups. **Conclusions** Combining different rotational alignment axes with navigation significantly reduces patellar maltracking and the need for LRR compared to the standard procedure

in which the posterior condylar axis is used as single anatomical reference.

## Introduction

Rotational alignment of the femoral component has been recognised as one of the factors which may affect the clinical outcomes in total knee arthroplasty (TKA) [1–4]. It has been reported that a poor femoral rotational alignment may lead to an unbalanced knee in flexion, limited range of motion (ROM), patellar maltracking and anterior knee pain [1–4].

Several techniques are commonly used to determine the rotational alignment of the femoral component, including the epicondylar axis, the anteroposterior axis (Whiteside line), the posterior condylar axis and the flexion space balancing technique [1, 5–7]. Although the use of each of these techniques was associated with satisfactory clinical outcomes [2, 5, 8], in vitro investigations have shown that they are often difficult to reproduce [9]. Navigation was found to improve the coronal and sagittal alignment of TKA compared to the standard technique [10], but whether it also leads to a better rotational alignment of the femoral component is debatable [11–13].

A poor alignment of the femoral component is a well-recognised cause of patellar maltracking [1–4]. When the latter is found at the end of surgery, the tracking of the patella in the trochlear groove may be improved by performing a lateral retinacular release (LRR) [14]. However, this surgical step is not free from complications, including haemarthrosis, increased postoperative pain, avascular necrosis, patella fracture and reduced skin viability with delayed wound healing [6, 14, 15].

In this investigation we compared the incidence of LRR in navigated TKA in which the rotational

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