



# Ten to fifteen-year survival of navigation-assisted total knee arthroplasty

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## Abstract

The survival rate of navigation-assisted total knee arthroplasty when mechanical revision was considered as the end-point was 98% after 10 years and 96% after 15 years. These figures compare favorably with previously published literature about conventional implantation. Longer follow-up is required to prove superiority of any technique.

## 1 Introduction

Total knee arthroplasty (TKA) is considered a highly successful procedure. Survival rates of more than 90% after 10 years are generally reported. However, complications and revisions may still occur for many reasons, and some of them may be related to the operative technique. Computer assistance has been suggested to improve the accuracy of implantation of a TKA (Jenny 2005). Short term results are still controversial (Roberts 2015). However, few long-term results have been documented (Song 2016). The present study was designed to evaluate the long-term (more than 10 years) results of a TKA which was routinely implanted with help of a non-image-based navigation system. The 5- to 8-year of this specific TKA has already been documented (Jenny 2013).

The hypothesis of this study will be that the 10 to 15-year survival rate of this TKA will be improved in comparison to historical papers when analyzing survival rates and knee function as evaluated by the Knee Society Score (KSS).

## 2 Material and methods

All patients operated on between 2001 and 2004 for implantation of a navigated TKA in the two participating centers were eligible for this study. Usual demographic and peri-operative items have been recorded. All patients were prospectively followed with clinical and radiological examination. All patients were contacted after the 10-year follow-up for repeat clinical and radiological examination (KSS, Oxford knee questionnaire and knee plain X-rays). Patients who did not return were interviewed by phone call. For patients lost of follow-up, family or general practitioner was contacted to obtain relevant information about prosthesis survival. Survival curve was plotted according to Kaplan-Meier, using the occurrence of TKA revision for mechanical reason as end-point

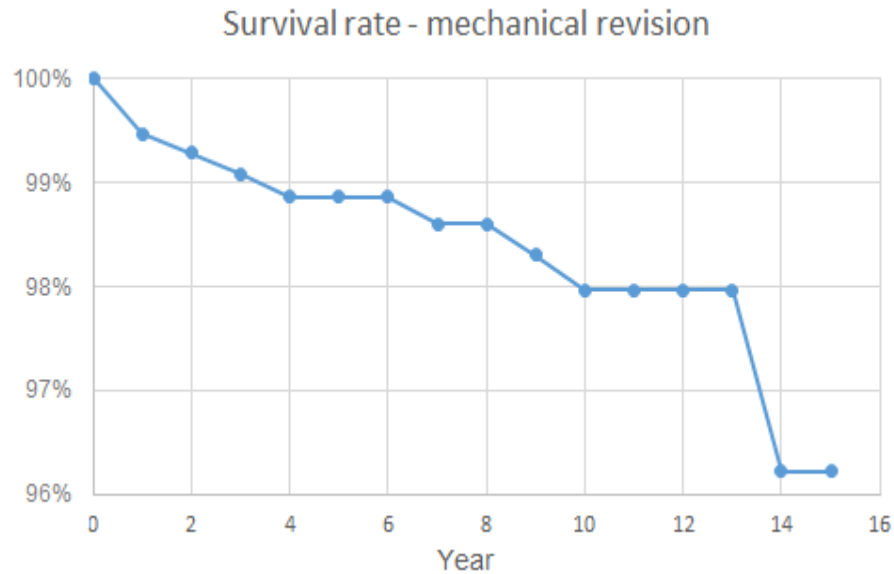
## 3 Results

578 TKAs were implanted during the study time-frame. 537 cases had an optimal lower limb axis (HKA angle between  $177^\circ$  and  $183^\circ$ ) after TKA (93%). 116 patients deceased prior to the 10-year follow-up (20%). Final follow-up (including death or revision) was obtained for 439 cases (76%). Clinical status after 10 years was obtained for 341 cases (59%) (KSS, 254 cases – Oxford questionnaire, 299 cases – radiologic evaluation, 197 cases). 10 prosthetic revisions were performed for mechanical reasons during the follow-up time (2%). The global 10-year survival rate was 95.5%, and it decreased to 91.5% at 15 years. The 10-year survival rate for mechanical revision only was 98.0%, and decreased to 96.2% at 15 years (figure 1). The mean KSS at the last follow-up was 188 points, and the mean Oxford score was 55 points. No component was considered loose at the final radiographic evaluation. No polyethylene wear was detected at the final radiographic evaluation. No difference was observed between the two participating centers for any baseline or follow-up data. evaluation.

## 4 Discussion

The present study represents the longer follow-up of navigated TKAs published in the literature. This study confirms our initial hypothesis, namely quite satisfactory results of navigated implanted TKA after more than 10 years. Navigation, whose precision is no longer to be demonstrated, probably contributed to the quality of the results. A more consistent anatomical reconstruction and ligamentous balance of the knee should lead to more consistent survival of the TKA. Other authors did observe similar results (Baumbach 2016). However, superiority of navigated TKA in comparison to conventional implanted TKA is difficult to prove because of the subtle differences expected in mostly underpowered studies (D'Amato 2018). Longer term follow-up may be required.

Figure 1: Survival rate – mechanical revision



## 5 References

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## 6 Disclosure

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