

Contents lists available at [ScienceDirect](#)

The Knee



Survivorship and patient satisfaction of robotic-assisted medial unicompartmental knee arthroplasty at a minimum two-year follow-up

Andrew D. Pearle^a, Jelle P. van der List^{a,*}, Lily Lee^a, Thomas M. Coon^b,
Todd A. Borus^c, Martin W. Roche^d

^a Hospital for Special Surgery, 535 East 70th St, New York, NY 10021, USA

^b Coon Joint Replacement Institute, 6 Woodland Road 202, St. Helena, CA 94574, USA

^c Legacy Salmon Creek Hospital, 2211 NE 139th Street, Vancouver, WA 98686, USA

^d Holy Cross Hospital, 103 SE 1st Ave, Fort Lauderdale, FL 33316, USA

ARTICLE INFO

Article history:

Received 29 July 2016

Received in revised form 28 November 2016

Accepted 8 December 2016

Available online xxxxx

Keywords:

Unicompartmental knee arthroplasty

UKA

Robot

Robotic

Survivorship

Satisfaction

ABSTRACT

Background: Successful clinical outcomes following unicompartmental knee arthroplasty (UKA) depend on lower limb alignment, soft tissue balance and component positioning, which can be difficult to control using manual instrumentation. Although robotic-assisted surgery more reliably controls these surgical factors, studies assessing outcomes of robotic-assisted UKA are lacking. Therefore, a prospective multicenter study was performed to assess outcomes of robotic-assisted UKA.

Methods: A total of 1007 consecutive patients (1135 knees) underwent robotic-assisted medial UKA surgery from six surgeons at separate institutions between March 2009 and December 2011. All patients received a fixed-bearing metal-backed onlay implant as tibial component. Each patient was contacted at minimum two-year follow-up and asked a series of five questions to determine survivorship and patient satisfaction. Worst-case scenario analysis was performed whereby all patients were considered as revision when they declined participation in the study.

Results: Data was collected for 797 patients (909 knees) with average follow-up of 29.6 months (range: 22–52 months). At 2.5-years of follow-up, 11 knees were reported as revised, which resulted in a survivorship of 98.8%. Thirty-five patients declined participation in the study yielding a worst-case survivorship of 96.0%. Of all patients without revision, 92% was either very satisfied or satisfied with their knee function.

Conclusion: In this multicenter study, robotic-assisted UKA was found to have high survivorship and satisfaction rate at short-term follow-up. Prospective comparison studies with longer follow-up are necessary in order to compare survivorship and satisfaction rates of robotic-assisted UKA to conventional UKA and total knee arthroplasty.

© 2016 Elsevier B.V. All rights reserved.

1. Introduction

Unicompartmental knee arthroplasty (UKA) is an increasingly popular surgical treatment for isolated medial compartment osteoarthritis (OA) of the knee [1]. Many distinct advantages of UKA compared to total knee arthroplasty (TKA) have been reported

* Corresponding author.

E-mail addresses: pearlea@hss.edu (A.D. Pearle), vanderlistj@hss.edu (J.P. van der List), leel@hss.edu (L. Lee), tcoon@osiresearch.com (T.M. Coon), toddborus@yahoo.com (T.A. Borus), Martin.roche@holy-cross.com (M.W. Roche).

<http://dx.doi.org/10.1016/j.knee.2016.12.001>

0968-0160/© 2016 Elsevier B.V. All rights reserved.

Please cite this article as: Pearle AD, et al, Survivorship and patient satisfaction of robotic-assisted medial unicompartmental knee arthroplasty at a minimum two-year follow-up, *Knee* (2016), <http://dx.doi.org/10.1016/j.knee.2016.12.001>

including lower perioperative morbidity [2,3], lower risk for infection [4], less blood loss [5], accelerated recovery [6,7] and improved range of motion [2,7]. A recent cost-effectiveness study demonstrated that medial UKA is preferable to TKA with decreased lifetime costs and improved quality of life in patients over 65 years of age [8].

In spite of these advantages, UKA may be an underutilized procedure [9,10]. This may be partially explained by concerns about short and long-term survivorship of UKA compared to TKA. Registry data demonstrated that 10-year survivorship of UKA (85–90%) is lower than TKA survivorship (95%) [11–13]. Recent literature also showed, however, that UKA performed in high-volume centers has a higher survivorship compared to low-volume UKA centers [14,15]. Several authors have shown that good results with UKA can be achieved by reporting a 10-year survivorship over 95% in high-volume UKA centers [16–19].

Recently, robotic-assisted surgery has been shown to reliably improve lower leg alignment [20–24], soft tissue balancing [25] and implant positioning [26–29] when compared to conventional UKA surgery. Since failure of UKA is commonly associated with technical errors of malalignment, instability and implant malpositioning [30–35], one would expect better results with robotic-assisted surgery; however early and long-term survivorship data of robotic-assisted UKA are lacking [36]. Therefore, the purpose of this multicenter study was to determine survivorship and patient satisfaction of robotic-assisted UKA at short-term follow-up.

2. Methods

2.1. Study design

In this prospective multicenter study, all patients were included who received a medial UKA with a fixed-bearing metal backed onlay tibial component between March 2009 and December 2011 (Figure 1). These patients represent the initial series of robotic-assisted MCK Medial Onlay UKAs (MAKO Surgical Corp., Ft. Lauderdale, FL, USA) performed by six surgeons, starting from the implant release date of March 2009. This corresponded to the release of the Robotic Arm Interactive Orthopedic (RIO) System (MAKO Surgical Corp., Ft. Lauderdale, FL, USA), a third generation robot-guided surgical instrument. Prior to this study, all surgeons participated in a knee course, in which the surgeons practiced robotic-assisted medial UKA on two to five cadaveric knees. Because half of the participating surgeons had previous robotic experience with UKA, this series included the robotic technology learning curve for three surgeons, and the implant learning curve for all six surgeons, both defined as the first 30 cases with the new technique and implant. The participating surgeons exhibited varying procedural volumes for robotic-assisted UKA during the study period, ranging from 4.6 to 15.8 procedures per month. The surgical indications for medial UKA were left to the discretion of the individual surgeons. This study was approved under the Western Institutional Review Board (WIRB) for all centers.

2.2. Robot characteristics

Accuracy of the RIO system has previously been well characterized. Mechanical alignment with this system is accurate within 1.6° of the preoperative plan [37], soft tissue balancing is accurate within 0.53 mm of the preoperative plan at all flexion angles [25] and component positioning is accurate for the femoral component within 0.8 mm and 0.9° of the original plan and for the



Figure 1. The MCK Medial Onlay UKA is shown with the femoral component, tibial component and the ultra-high-molecular-weight polyethylene (UHMWPE) insert.

Download English Version:

<https://daneshyari.com/en/article/5710671>

Download Persian Version:

<https://daneshyari.com/article/5710671>

[Daneshyari.com](https://daneshyari.com)