

Improved Outcomes Utilizing Advanced Robotic Arm Technology for UKA

By Martin W. Roche, MD

Long-term data on knee replacements have demonstrated that patients prefer an ACL-preserving unicompartmental knee replacement (UKA) over a total knee replacement (TKA) and that they recover more rapidly. Yet, UKA accounts for only 10-12% of the knee arthroplasty cases in the US, even though up to 20% of knee replacements are eligible for a unicompartmental procedure.

This relatively low percentage of UKAs may be attributed to factors including surgeon education focusing on TKAs, a lack of confidence in achieving consistent surgical results in UKA procedures, concerns about proper patient selection for UKAs, and lingering concerns about implant survivorship.



Prior to 2006 the instrumentation used in unicompartmental procedures had not advanced to enable consistently reproducible surgical results. While the advancement of minimally invasive techniques showed improvement in early patient recovery, less blood loss and post-op pain, concerns were raised about the lack of visualization during manual UKA procedures leading to improper implant

placement, which can cause wear and reduce longevity.

The introduction of MAKOplasty® enabled by robotic arm technology for unicompartmental knee replacement has revolutionized the overall approach to knee arthritis. MAKOplasty is an integrated procedure that offers patient-specific pre-operative planning using a 3-D model created from a CT-Scan, while enabling intra-operative adjustments prior to any bone resection. This allows optimization of the patient's leg alignment, implant position, and gap balance based on the patient's individual knee dynamics and kinematic profile.

MAKOplasty also provides tactile guidance, which enhances the safety and reproducibility of the procedure, and has motivated adoption of this minimally invasive approach.

Over the past several years, multiple papers have reported improved surgical accuracy, better aligned implants, and less bone resection in procedures utilizing the MAKOplasty robotic arm technology. The remaining question is "Does this technology lead to better outcomes?"

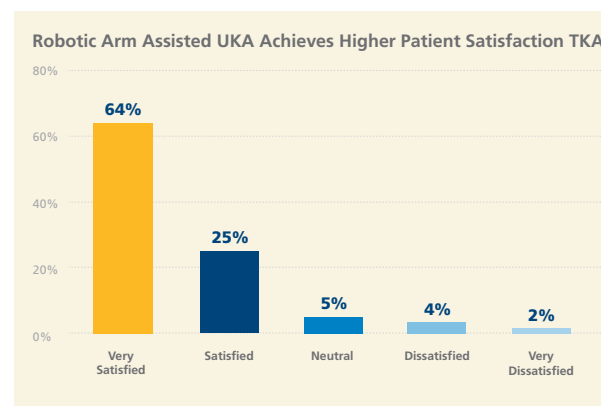
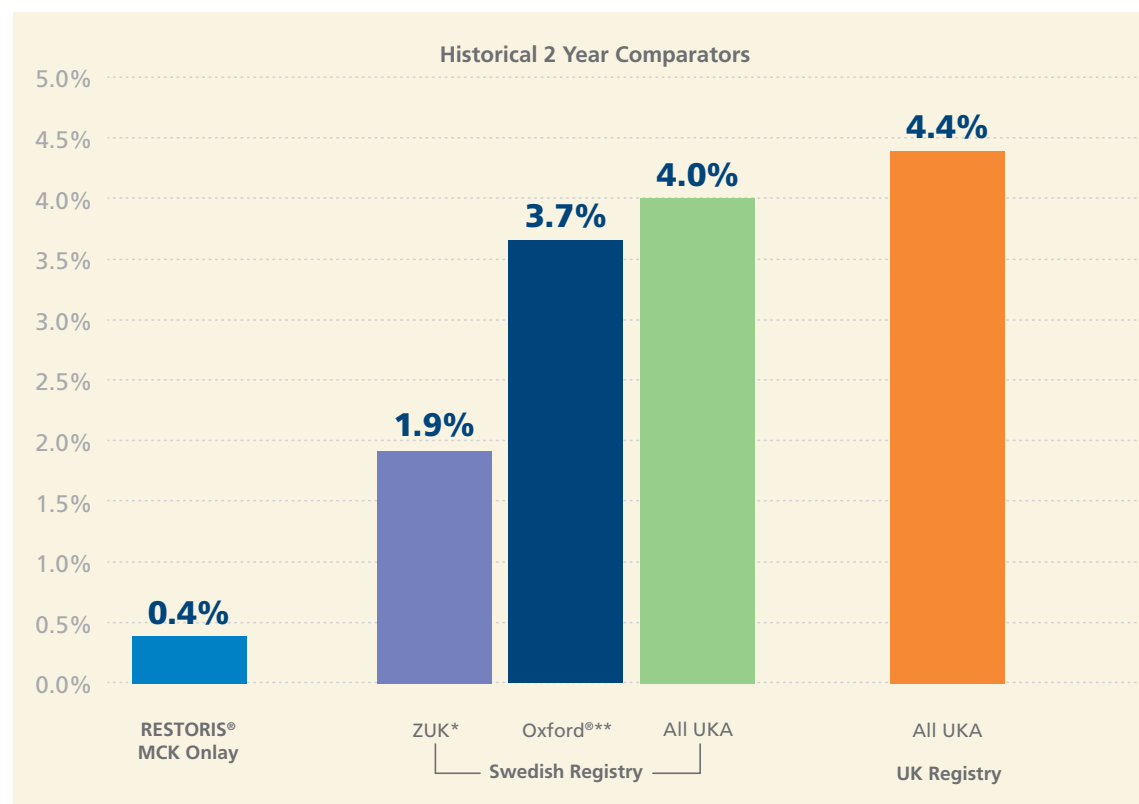
We participated in a recent multi-center study³ with three other institutions to determine implant survivorship of RESTORIS® MCK medial onlays implanted with robotic arm technology. 201 patients (224 knees) were enrolled in the study,



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with a minimum two year follow up (average follow up: 32 ± 5 months). Patients enrolled in the study included those from initial and consecutive series for each surgeon. One failure was reported at two plus years for an overall very low revision rate of 0.4%. This compares to a 4.0% revision rate at two years for manual unicompartmental knee arthroplasty reported in the Swedish National Joint Registry, and a 4.4% revision rate reported in the UK National Joint Registry.

We also assessed patient satisfaction rates at two plus years. Results indicated that 89% of patients receiving robotic arm assisted UKA were "Very Satisfied" or "Satisfied" (200/244).¹ This compares to 75% of TKA patients who reported being "Very Satisfied" or "Satisfied" in a similar study by Noble et al.⁴



IN CONCLUSION:

- Robotic arm assisted UKA shows excellent survivorship at two years post-op
- Patients with robotic arm assisted UKA exhibit a high level of satisfaction compared to manual TKA
- Results suggest that the increased accuracy of implant placement achieved with robotic arm assisted UKA may lead to superior long-term patient outcomes

*ZUK: Zimmer® Unicompartmental High Flex Knee
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