

# The learning curve associated with robotic-arm assisted unicompartmental knee arthroplasty: a prospective cohort study

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## Goal of study

- Primary aim: determine surgical team’s learning curve for introducing robotic-arm assisted unicompartmental knee arthroplasty (UKA) into routine surgical practice
- Secondary aim: compare accuracy of implant positioning in conventional jig-based UKA versus robotic-arm assisted UKA

## Materials and methods

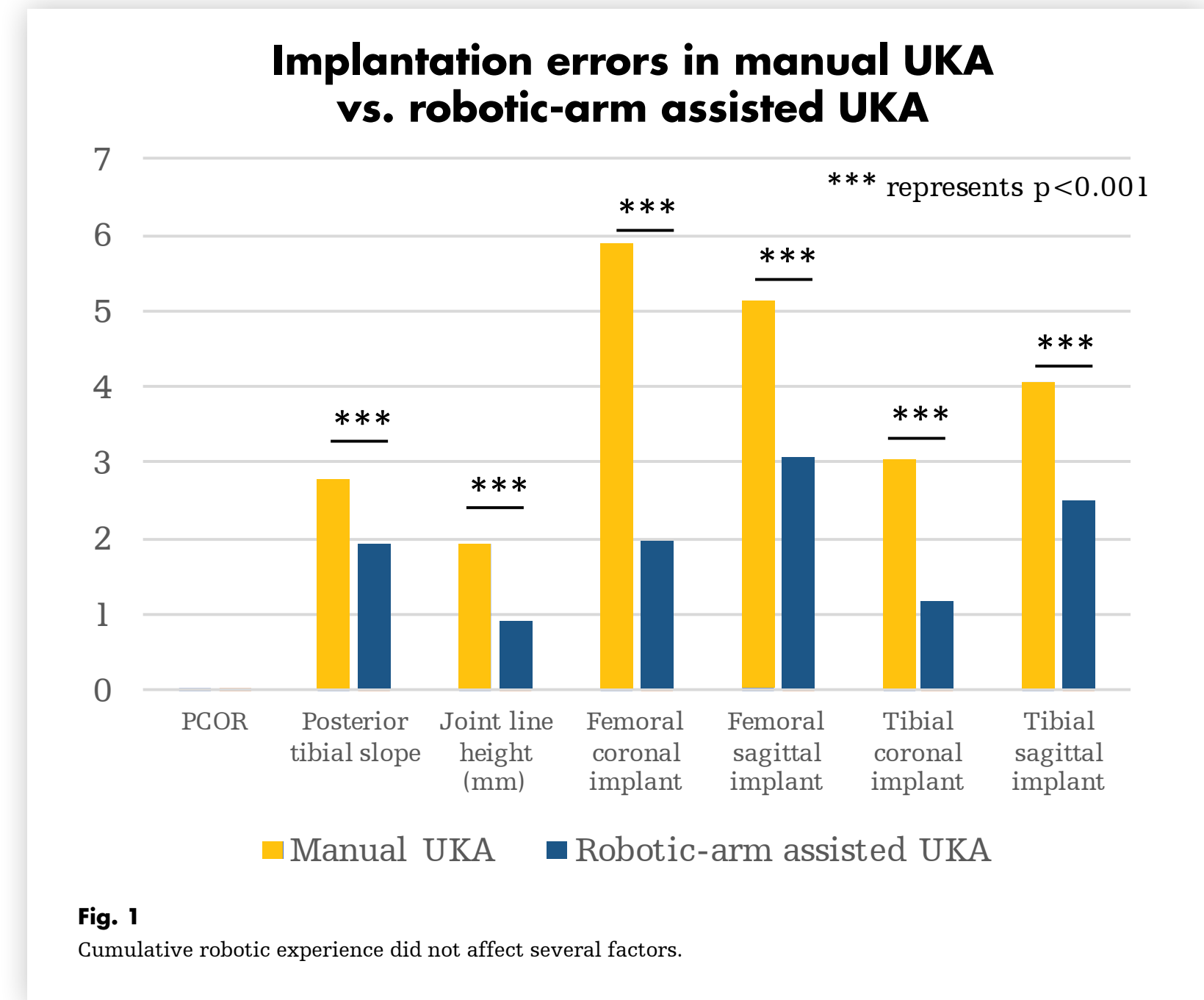
- Prospective single-surgeon cohort study
- Study groups:
  - Conventional UKA: 60 consecutive medial conventional jig-based UKAs with Oxford implant
  - Robotic-arm assisted UKA: 60 consecutive medial Mako UKAs with Restoris MCK implants
- Patient groups were well-matched for baseline characteristics including: age, BMI, and gender
- Surrogate measures of the learning curve were prospectively collected, including: operative times, accuracy of implant positioning, limb alignment, and postoperative complications
- Spielberger State-Trait Anxiety Inventory (STAI) questionnaire was collected for each case to assess preoperative stress levels amongst the surgical team

## Results

- Robotic-arm assisted UKA was associated with a learning curve of six cases for operating time ( $p < 0.001$ ) and surgical team confidence levels ( $p < 0.001$ )
- Cumulative robotic experience did not affect: (**Fig. 1**)
  - Accuracy of implant positioning ( $p = 0.52$ )
  - Posterior condylar offset ratio ( $p = 0.71$ )
  - Posterior tibial slope ( $p = 0.68$ )
  - Native joint line preservation ( $p = 0.55$ )
  - Postoperative limb alignment ( $p = 0.65$ )
- Compared to the 60 manual UKA cases, robotic-arm assisted UKA had improved accuracy to plan of femoral ( $p < 0.001$ ) and tibial ( $p < 0.001$ ) implant positioning
- Robotic-arm assisted UKA group had no additional risk of postoperative complications compared to conventional jig-based UKA

## Conclusion

- Robotic-arm assisted UKA was associated with a learning curve of six cases for operating time and surgical team confidence levels
- Robotic-arm assisted UKA does not have a learning curve for accuracy in achieving the planned femoral and tibial implant positioning
- There is no additional risk of postoperative complications during the learning phase of robotic-arm assisted UKA compared to conventional jig-based UKA



**Fig. 1**  
Cumulative robotic experience did not affect several factors.

**Reference:**  
Kayani B, Konan S, Pietrzak JRT, Huq SS, Tahmassebi J, Haddad FS. The learning curve associated with robotic-arm assisted unicompartmental knee arthroplasty. Bone Joint J 100-B. 2018;1033-42.

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