

# Robotic-arm assisted versus conventional unicompartamental knee arthroplasty: exploratory secondary analysis of a randomized controlled trial

M. J. G. Blyth, MBChB, FRCS (Tr&Orth), Orthopaedic Surgeon; I. Anthony, PhD, Orthopaedic Research Manager; A. MacLean, MBChB, FRCS (T&O), Orthopaedic Surgeon; B. Jones, MBChB, FRCS (Tr&Orth), Orthopaedic Surgeon, Department of Orthopaedics, Glasgow Royal Infirmary, Glasgow, G4 0SF, UK; P. Rowe, PhD, Professor of Rehabilitation Science; M. S. Banger, MEng, Research Associate, University of Strathclyde, Glasgow, G1 1XQ, UK

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## Goal of study

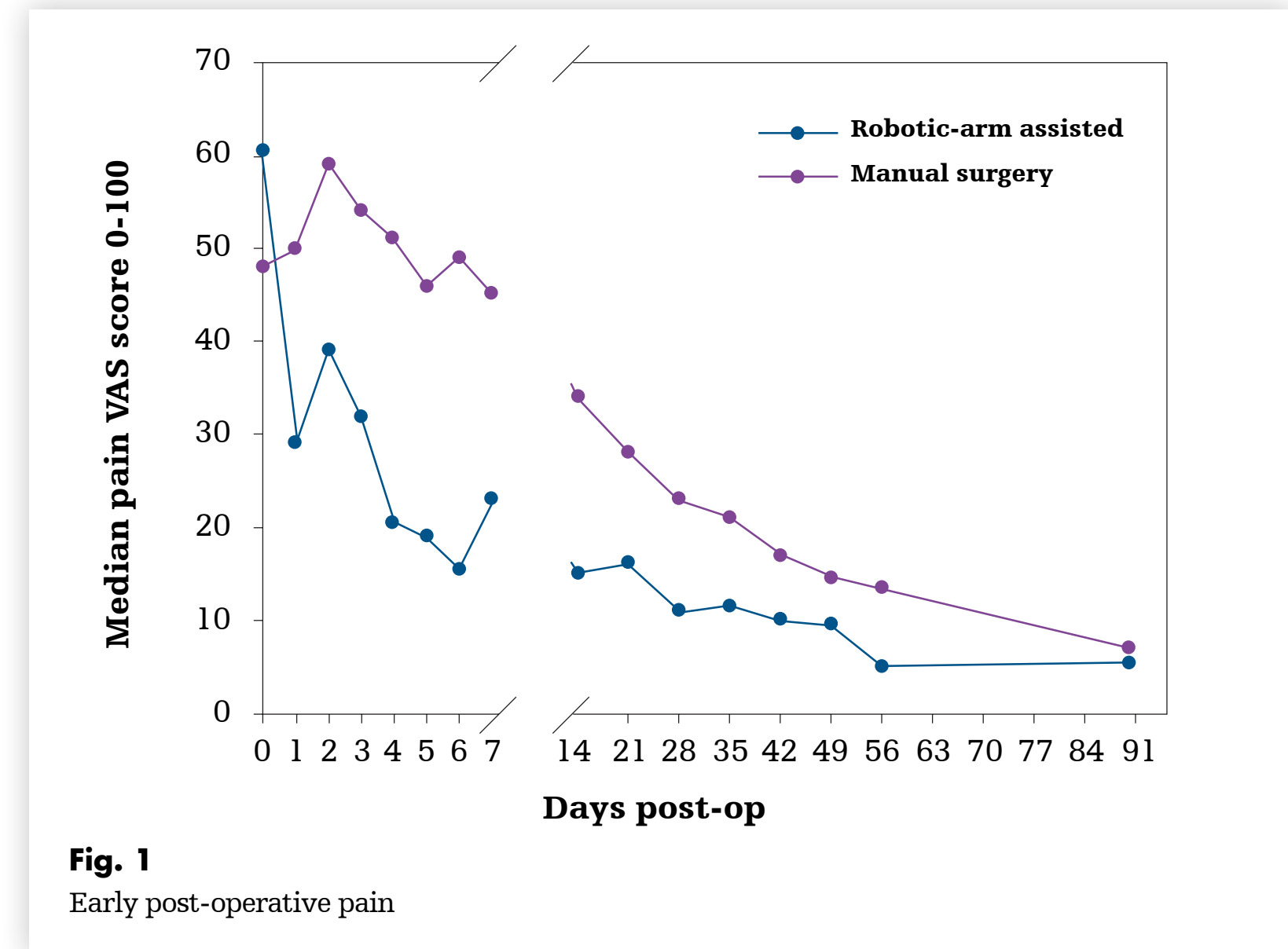
- To report on early clinical outcomes from a randomized controlled trial comparing robotic-arm assisted UKA and manual UKA patient groups
- Early clinical outcomes reported at 3 months and 1 year post-operative

## Materials and methods

- Prospective, single-blinded, randomized controlled trial
- Surgical technique groups:
  - Robotic-arm assisted UKA, performed with Mako System, using Restoris MCK implants
  - Manual UKA, performed with traditional jig-based approach, using Oxford implants
- Patient group size:
  - Robotic-arm assisted UKA: n = 64 at 3 months, n = 64 at 1 year
  - Manual UKA: n= 65 at 3 months, n = 62 at 1 year
- Outcome measures:
  - American Knee Society Score (AKSS)
  - Oxford Knee Score (OKS)
  - Forgotten Joint Score
  - Hospital Anxiety Depression Scale
  - University of California at Los Angeles (UCLA) activity scale
  - Short Form-12
  - Pain Catastrophising Scale
  - Somatic disease (Primary Care Evaluation of Mental Disorders Score)
  - Pain visual analogue scale
  - Analgesic use
  - Patient satisfaction
  - Complications relating to surgery
  - 90-day pain diaries
  - The requirement for revision surgery

## Results

- From the first post-operative day through to week 8 post-operatively, the median pain scores for the robotic-arm assisted group were 55.4% lower than those observed in the manual surgery group (p = 0.040) (**Fig. 1**)
- Key factors in achieving an “excellent” AKSS score:
  - High pre-operative UCLA activity score (>5)
  - Use of robotic-arm assisted technology
  - Not having pre-operative depression
- At 3 months post-operatively:
  - The robotic-arm assisted group had better AKSS (robotic media 164, interquartile range (IQR) 131 to 178, manual median 143, IQR 132 to 166)
  - Proportion of patient achieving a FJS > 80% was almost double in the robotic-arm assisted group (15% versus 8%, p=0.265)
  - No difference noted with OKS
- At 1 year post-operatively:
  - Greater proportion of patients receiving robotic-arm assisted surgery improved their UCLA activity score
  - The observed difference with AKSS had narrowed from 3 months to 1 year, with most patients reaching the ceiling for AKSS; median reduced from 21 to 7 points (p = 0.106) (robotic median 171, IQR 153 to 179; manual median 164, IQR 144 to 182)
  - No difference observed with OKS; almost half of each group reached the ceiling limit of the score



**Fig. 1**  
Early post-operative pain

## Conclusion

- Robotic-arm assisted surgery resulted in improved early pain scores and early function scores in some patient-reported outcomes measures, including AKSS and FJS
- At 1 year post-operative, median early outcome scores were more similar between groups, with most patients in both surgical groups reaching toward the ceiling level of these scores
- Key factors associated with achieving excellent AKSS outcomes included: high pre-operative UCLA activity score, use of robotic-arm assisted technology, and not having pre-operative depression
- A larger multi-center study was strongly recommended to understand the effectiveness of robotic-arm assisted technology

**Reference:**  
Blyth MJ, Anthony I, Rowe P, Banger MS, MacLean A, Jones B. Robotic-arm assisted versus conventional unicompartamental knee arthroplasty: Exploratory secondary analysis of a randomized controlled trial. Bone and Joint Research. 2017;16(11):631-9.  
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