

Accuracy, surgical time and clinical outcomes of the VELYS Robotic-Assisted Solution (VRAS) in total knee arthroplasty – A systematic review.



British Orthopaedic Trainees Association

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Background:

Robotic assisted total knee arthroplasty (RATKA) has proven to be a suitable technique in the literature. Previous reviews have observed RATKA improving accuracy but increasing surgical time compared to conventional total knee arthroplasty (cTKA). The effect on clinical outcomes remains unclear. The VELYS™ Robotic-Assisted Solution (VRAS) is the newest robotic system introduced in clinical use within the NHS. This imageless system may provide further benefits such as being less resource-intensive and reducing patient radiation exposure. This is the first systematic review on this specific robotic system

Method:

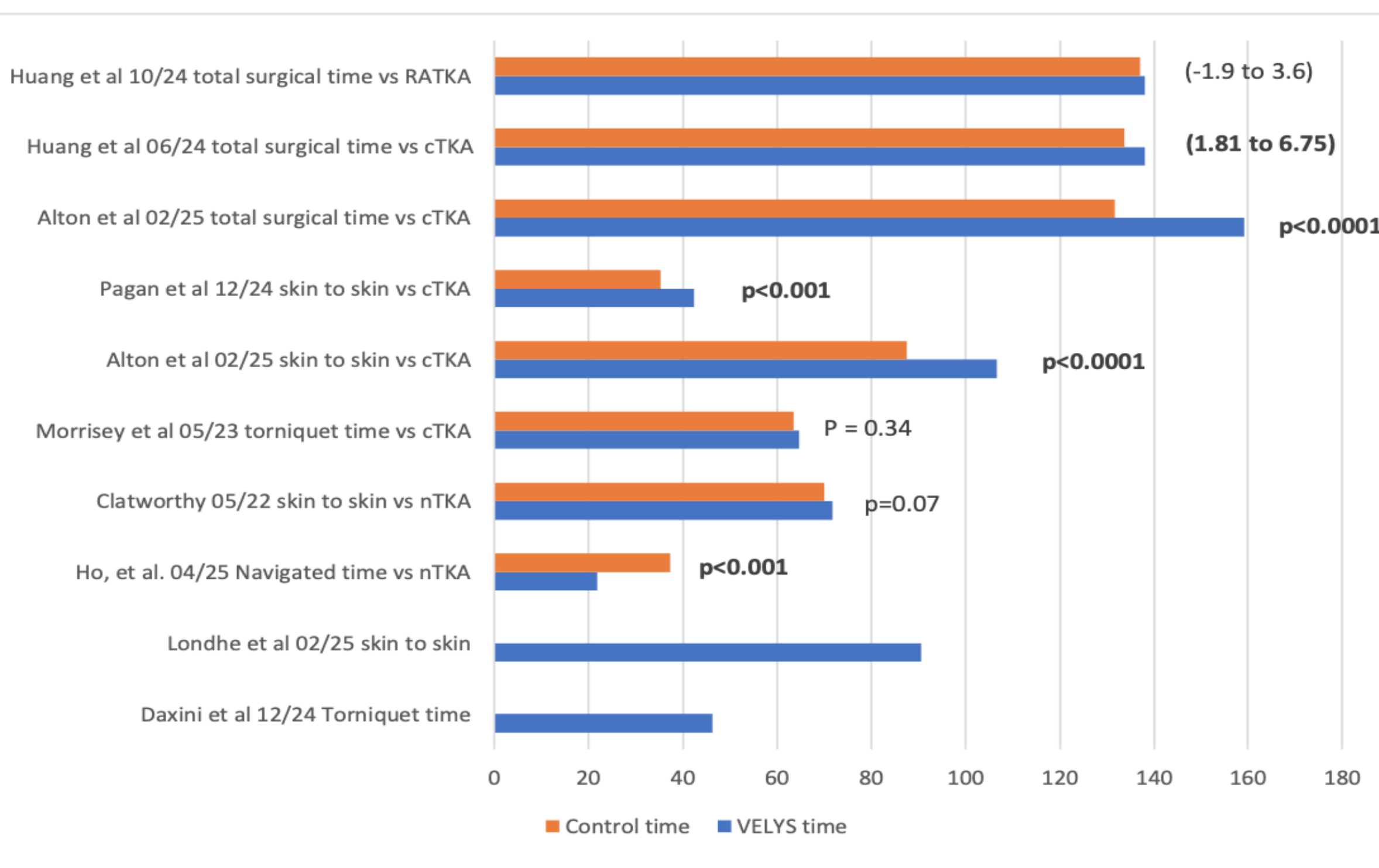
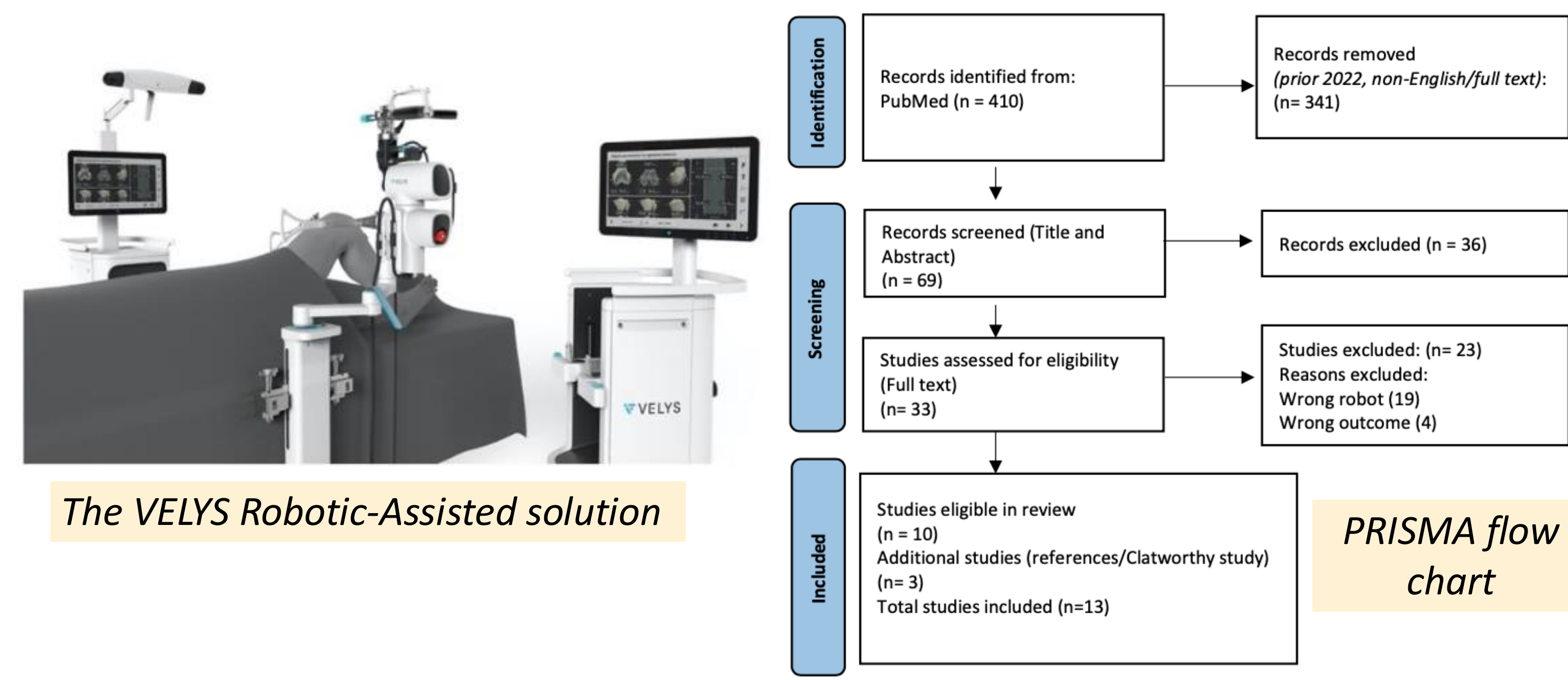
A systematic review was undertaken searching PUBMED for studies looking at the VRAS system, compared to any other technique, assessing accuracy, surgical time and clinical outcomes. Clinical outcomes were split into subjective patient reported outcome measures (PROMs) and objective clinical outcomes like length of stay and range of movement (ROM).

Results:

410 articles were assessed, 13 studies were deemed appropriate for inclusion in this review. Four of these compared accuracy of VRAS to cTKA, all these studies observed some improvement in accuracy in several radiological measurements. 4 out of 5 studies comparing VRAS to cTKA quoted significantly increased surgical time, (mean minutes added ranging from 4.29 to 27.7). Four studies commented on learning curve which varied from 2 to 15 operations. Studies comparing surgical time of VRAS to navigated TKA/ other RATKA mainly found no significant difference. Four studies showed no statistically significant difference in ROM. There was a suggestion of improved early pain scores, however 1-year outcomes were equivalent. A wide variety of PROMs and definitions of surgical time were used, making it difficult to undertake meta-analysis calculations for these outcomes.

Conclusion:

VRAS has demonstrated equivalent clinical outcomes and longer surgical time compared to cTKA. Improved radiological outcomes have been demonstrated but longer term clinical follow up is needed to evaluate its clinical benefit. Future studies with well-defined outcomes may allow meta-analyses to be undertaken.



*Surgical times VELYS vs controls in minutes (significance values) **Statistically significant results in bold.***

Forest plot; Short term Range of movement (6-12 weeks) Control vs VRAS

