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Research Article

Comparison of Operating Time and Hospital Stay in Conventional Versus Robotic-Assisted Knee Arthroplasty Using the Stryker Mako Robotic Arm

Satish Bugwandin*

Department of Orthopaedic Surgery, Lenmed Ethekwini Hospital and Heart Centre, South Africa

***Corresponding Author:** Satish Bugwandin, Department of Orthopaedic Surgery, Lenmed Ethekwini Hospital and Heart Centre, South Africa.

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Abstract

Knee arthroplasty is a common orthopedic procedure used to alleviate pain and restore function in patients with advanced knee arthritis. Robotic-assisted technology, such as the Stryker Mako robotic arm, has been introduced with the aim of enhancing the precision and outcomes of knee arthroplasty surgeries. This study aimed to compare the operating time and hospital stay between conventional and robotic-assisted knee arthroplasty procedures using the Stryker Mako robotic arm. A total of 226 knee arthroplasty surgeries, including 102 conventional procedures performed between 2018 and 2021 and 124 robotic-assisted procedures performed between 2022 and 2023, were analyzed. The results indicated significantly shorter operating times and decreased length of hospital stay for patients undergoing robotic-assisted knee arthroplasty.

Keywords: Versus Robotic; Knee Arthroplasty; Stryker Mako; Robotic Arm

Introduction

Knee osteoarthritis is a prevalent condition that can cause significant pain and disability in affected individuals. Knee arthroplasty, commonly known as knee replacement surgery, has become a widely accepted treatment option for patients with advanced knee arthritis. The introduction of robotic-assisted technology has raised interest in the potential benefits of improving surgical precision and patient outcomes [1]. The Stryker Mako robotic arm is one such system that has been utilized for robotic-assisted knee arthroplasty. This study aimed to compare the operating time and hospital stay between conventional and robotic-assisted knee arthroplasty procedures using the Stryker Mako robotic arm.

Materials and Methods

A retrospective analysis was conducted on 226 knee arthroplasty surgeries performed by a single surgeon at a designated orthopedic facility. A total of 102 uncomplicated conventional knee arthroplasty surgeries undertaken between 2018 and 2021 were compared to 124 uncomplicated robotic knee arthroplasty surgeries undertaken between 2022 and 2023. The operating time, defined as the time from incision to closure, and the length of hospital stay were recorded and compared between the two groups. Cases involving revision surgery and those with postoperative complications were excluded from the study. Additionally, cases performed during the learning curve of robotic surgery, which we defined as the initial 50 cases, were not included in the analysis [2].

Results

The results of the study revealed a shorter operating time for patients undergoing robotic-assisted knee arthroplasty, with a mean time of 46 minutes compared to 58 minutes for conventional knee arthroplasty. Furthermore, the length of hospital stay was decreased for patients undergoing robotic surgery, with a mean stay of 2.1 days compared to 3.8 days for conventional surgery. These differences were found to be statistically significant ($p < 0.05$).

Discussion

The findings of this study demonstrate that robotic-assisted knee arthroplasty using the Stryker Mako robotic arm was associated with a significantly shorter operating time and a decreased

length of hospital stay compared to conventional knee arthroplasty. These results align with previous studies [1-3] that have suggested the potential benefits of robotic technology in improving surgical efficiency and patient recovery in orthopedic procedures. The shorter operating time observed in robotic-assisted procedures may be attributed to the enhanced precision and preoperative planning facilitated by the robotic system [1,3]. Similarly, the decreased length of hospital stay may be indicative of improved post operative recovery and rehabilitation in patients undergoing robotic-assisted knee arthroplasty [1]. However, it is important to note that this study focused on uncomplicated cases, and further research is needed to evaluate the long-term outcomes, cost-effectiveness, and potential complications associated with robotic-assisted knee arthroplasty. Future investigations should also assess patient-reported outcomes, such as pain relief, functional recovery, and overall satisfaction, to comprehensively evaluate the impact of robotic technology on the field of orthopedic surgery.

Conclusion

In conclusion, the present study provides evidence that robotic-assisted knee arthroplasty using the Stryker Mako robotic arm may offer advantages in terms of operating time and hospital stay when compared to conventional knee arthroplasty. The shorter operating time and decreased length of hospital stay observed in the robotic-assisted group suggest potential benefits for both patients and healthcare facilities.

Bibliography

1. Kayani B., *et al*. "Robotic-arm assisted total knee arthroplasty is associated with improved early functional recovery and reduced time to hospital discharge compared with conventional jig-based total knee arthroplasty: a prospective cohort study". *Bone Joint Journal* 100-B.7 (2018): 930-937.

2. Sodhi N., *et al*. "The learning curve associated with robotic total knee arthroplasty". *The Journal of Knee Surgery* 31.1 (2018): 17-21.

3. Blyth MJG., *et al*. "Robotic arm-assisted versus conventional unicompartmental knee arthroplasty: Exploratory secondary analysis of a randomised controlled trial". *Bone Joint Research* 6.11 (2017): 631-639.