A Comparison of 90-Day Complication Rates Between Intra-incisional and Extra-incisional Pin Sites in Robotic Total Knee Replacement

Drake G Lebrun[1], Sonia Kaur Chandi, Colin Neitzke[2], Jonathan M Vigdorchik[2], Steven B Haas[3]
[1]Adult Reconstruction and Joint Replacement, Hospital for Special Surgery, [2]Hospital For Special Surgery, [3]Hosp for Special Surgery

INTRODUCTION: Robotic-assisted total knee arthroplasty (TKA) has grown tremendously in the last several years. Robotic-assisted TKA platforms require tibial and femoral pins to support rigidly fixed navigation arrays. These pins can be placed inside or outside the primary incision, though intra-incisional placement is currently off-label for some platforms. We sought to compare 90-day complication rates between three different pin configurations: all-outside, intra-incisional femur/extra-incisional tibia, and all-inside.

METHODS: A retrospective cohort study of 2,880 patients undergoing robotic primary TKA was performed, including 1,004 patients (35%) with all-outside pins, 1,056 patients (37%) with intra-incisional femur/extra-incisional tibia pins, and 820 patients (29%) with all-inside pins. The primary outcomes were primary wound complications and pin site wound complications within 90 days. Secondary outcomes were manipulations under anesthesia (MUAs), complex regional pain syndrome (CRPS), and periprosthetic fractures.

RESULTS: Among patients with extra-incisional tibial pins, there were 41 (2.0%) tibial pin site wound complications. Among patients with extra-incisional femoral pins, there were 3 (0.3%) femoral pin site wound complications. There were 109 (3.8%) wound complications involving the primary incision. There was no difference in primary wound complication rates between the all-outside, intra-incisional femur/extra-incisional tibia, and all-inside groups (3.3% vs. 3.9% vs. 4.3%, p=0.54). There were 18 major wound complications requiring reoperation or readmission; 13 of these involved the primary incision only, 3 involved the primary incision and tibial pin sites, and 2 involved the tibial pin sites only. There were no differences between the three groups in the rates of CRPS (0.1% vs. 0.1% vs. 0.6%, p=0.06) or MUAs (4.1% vs. 2.4% vs. 3.4%, p=0.09), respectively. There were no intraoperative or postoperative periprosthetic pin-related fractures in the study sample.

DISCUSSION AND CONCLUSION: Primary wound complications rates were similar in patients with pins placed outside or within the primary incision during robotic TKA. However, among patients with extra-incisional tibial pins, there was an additional 2.0% risk of tibial pin site-related wound complications. All-inside pin placement did not lead to an increased risk of CRPS, MUAs, or pin-related periprosthetic fractures compared to extra-incisional tibial pins.