

Intra-incisional Pin Placement is Safe for Robotic-assisted Total Knee Arthroplasty (TKA)

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INTRODUCTION:

Robotic-arm assisted total knee arthroplasty (RA-TKA) has seen a major increase in its utilization. However, it requires bone array pins to be fixed into the femur and tibia which intrinsically carries a risk. As it is currently off-label with some robotic platforms to place pins intra-incisional, and literature on pin-site complications is limited, this study aimed to evaluate the safety of intra-incisional pin placement during RA-TKAs. We hypothesized that these complication rates will be low, demonstrating the safety of intra-incisional pin placement in RA-TKA.

METHODS:

Between January 2018 and January 2022, 2,395 patients received a RA-TKA at our healthcare system, all of which have been included for this study. A validated, institutional prospective data collection instrument was utilized to identify patients that had intra- and/or post-operative complications. These cases were retrospectively reviewed for complications to determine whether they could be attributed to metaphyseal intra-incisional pin placement using 4.0mm pins (two tibial and two femoral). To note, surgeons would selectively place extra-incisional pins in the presence of previous osteosynthesis or bone deformity. Primary outcomes included periprosthetic fracture and infection, while secondary outcomes included 1-year re-operation rate.

RESULTS:

Our study population experienced a low incidence of periprosthetic fracture (0.17%), infection (1.5%), and reoperation (1.4%) within 1-year. There were a total of 4 periprosthetic fractures: 1 post-operative femur, 1 post-operative patella, 1 intra-operative tibia, and 1 intra-operative femur. Of these fractures, only three were potentially associated to pin site location. Additionally, there were a total of 36 post-operative infections (20 superficial, 16 deep), of which 20 required re-operation. Lastly, there were a total of 12 additional reoperations that were not associated to periprosthetic fracture nor infection, none of which were attributable to pin site location.

DISCUSSION AND CONCLUSION:

Overall a very low risk of periprosthetic fracture associated with intra-incisional bone pins placement for robotic-arm assisted TKA was seen, without an increase in post-operative infection risk. These findings suggest that surgeons may safely utilize intra-incisional metaphyseal pin placement for robotic-arm assisted TKA, with selective extra-incisional pin placement in the presence of previous osteosynthesis or stress-raisers in the metaphyseal region.

Primary and Secondary Outcomes		
Periprosthetic Fractures	Intra-operative	2
	Post-operative	2
Infections	Superficial Infection	20
	Deep Infection	16
Reoperations	Deep Infection	16
	Superficial Infection	4
	Periprosthetic Fracture	2
	Aseptic Loosening	2
	Hematoma	2
	Instability	2
	Other	6
	Total	52