

Barbed vs. Standard Sutures for Closure in Total Knee Arthroplasty: A Multicenter Prospective Randomized Trial

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Introduction: In total joint arthroplasty, running knotless barbed suture, compared to standard interrupted knotted suture, has been associated with improved closure efficiency and similar safety in prior retrospective and small prospective studies. In this multicenter randomized controlled trial, we hypothesized that barbed suture would be associated with similar closure related complications, similar clinical outcomes, similar patient satisfaction, shorter closure times, and lower cost as compared to standard suture.

Methods: We performed a patient blinded multicenter randomized control trial of 411 patients undergoing primary TKA. One group received running barbed suture and the other interrupted standard suture for the fascial and deep dermal layers. Demographics, as well as pre-operative, 2-week, and 6-week Knee Society Scores were compared. Closure time was measured and a cost analysis was performed based on suture and operating room time costs. Intra-operative and post-operative complications were recorded. Patient satisfaction and wound cosmesis scores were obtained at 6-weeks.

Results: Seventeen patients were withdrawn due to incorrect suture use, leaving 191 TKAs randomized to barbed suture and 203 randomized to standard suture. Mean closure time was shorter with barbed suture (9.8 vs. 14.5 min, $p < 0.001$), and total closure cost was less with barbed suture (\$327 vs. \$426, $p < 0.001$). Intra-operatively, there were more broken sutures in the barbed group (12 vs. 0, $p < 0.001$), though we noted a trend toward more needle sticks in the knotted group (5 vs. 1, $p = 0.22$). Wound complications, post-operative complications, clinical scores, patient satisfaction, and wound cosmesis scores were similar between the groups.

Conclusion: The use of barbed suture is associated with shorter closure time, lower cost, and no difference in wound complications, postoperative complications, clinical outcomes, or patient satisfaction in primary TKA. Additionally, we noted a trend toward fewer needle sticks with the use of barbed suture. Barbed suture appears to be a reasonable option for closure in TKA.

