

Cost-Benefit Analysis of Syndesmotic Screw Versus Suture-Button Fixation in Tibiofibular Syndesmotic Injuries

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Purpose: Although suture buttons have been shown to have a lower rate of reoperation than screws in syndesmosis repair, the cost of these implants is up to 40 times greater than that of screws. This study was undertaken to evaluate the cost-effectiveness of suture buttons in syndesmosis repair.

Methods: A decision-tree model was constructed to describe outcomes after syndesmosis repair using suture buttons and standard syndesmotic screws. Outcomes were uneventful healing, removal of symptomatic implants, infection requiring debridement, and persistent diastasis requiring revision. Weighted literature averages were used to estimate variables to define a baseline model. Outcomes were measured in quality-adjusted life years (QALYs). Procedure and implant costs were derived from Medicare reimbursement rates and the University Health System Consortium (UHC), respectively. An incremental cost-effectiveness ratio (ICER) threshold of \$50,000 per QALY was used to evaluate cost-effectiveness. Sensitivity analysis was then performed on multiple variables to assess cost-effectiveness across a range of values.

Results: The baseline model did not show the use of suture buttons to be cost-effective at a price of \$850 (the median price per the UHC). Holding all other variables fixed, the suture button became cost-effective at a price of \$792. With a suture button price of \$850, if the implant removal rate for syndesmotic screws is at least 8% greater than the removal rate of suture buttons, then a suture button would be more cost-effective. Hence, for the baseline removal rate for symptomatic suture buttons (5.9%), symptomatic screw removal rate must be less than 13.9% for screws to be cost-effective. Sensitivity analysis showed that the model is exquisitely sensitive to small perturbations in reoperation rates.

Conclusion: Moving away from the practice of routinely removing all syndesmotic screws has changed the financial landscape of syndesmosis repair considerably. Suture buttons are cost-effective alternatives to screws in patient populations or practices in which screw removal is expected to be above a certain calculable threshold. More specifically, at the median UHC cost, suture buttons are likely to be cost-effective over screws for symptomatic screw removal rates greater than 13.9%. Cost-effectiveness is notably sensitive to changes in implant removal rates and the number of devices used per patient. We strongly recommend that each surgeon perform their own analysis based on their patient outcomes and implant removal rates.