Cost-Effectiveness of Operative Versus Nonoperative Management of Acute Achilles Tendon Ruptures
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Introduction/Purpose: The management of acute Achilles tendon ruptures remains controversial. Proponents of operative treatment cite lower rates of re-rupture, the potential for better functional outcomes and earlier return to activity. However, operative management incurs the added risks of surgical complications and the considerable cost of the surgical procedure. The goal of this study was to evaluate the cost-effectiveness of operative versus nonoperative management of acute Achilles tendon ruptures using the best available evidence regarding the costs and benefits of these two strategies.

Methods: A Markov cost-utility analysis was conducted from the societal perspective to evaluate the cost-effectiveness of operative versus nonoperative management of acute Achilles tendon ruptures over a two-year time-period. Hospital costs were derived from New York SPARCS data, physician and rehabilitation costs were derived from Medicare physician fee schedules, and indirect costs of missed work were calculated using the average U.S. hourly earnings from the Bureau of Labor Statistics. Rates of re-rupture, major and minor complications, and the costs of managing these complications were obtained from the literature. For the base-case model, operative and non-operative patients were assumed to have the same utilities (quality of life) following surgery. The robustness of the model to uncertainty in the input parameters was examined through sensitivity analyses varying inputs over plausible ranges from the literature. Results are presented as costs (2014 US$), quality-adjusted life years (QALYs), and incremental cost-effectiveness ratios with 95% confidence intervals.

Results: In the base-case model, nonoperative management of acute Achilles tendon ruptures dominated operative management, resulting in both lower costs and greater benefits. The total cost of operative management was $13,936 versus $13,430 for nonoperative management. The initial surgical cost for Achilles tendon repair, $3,145 ($3,045-$3,244), was largely offset through reduced indirect costs from fewer missed days of work, 19 (4-34) days. In sensitivity analyses, if surgical costs dropped below $2,621 or the hourly wage rose above $29, then operative treatment became a cost-effective strategy at the willingness-to-pay threshold of $50,000/QALY. The model results were highly sensitive to the relative utilities for operative versus nonoperative treatment. If nonoperative utilities decreased relative to operative utilities by just 1.6%, then operative management became the dominant treatment strategy.

Conclusion: Surgical costs and the economic impact associated with return to work are important determinants of cost-effectiveness for Achilles tendon ruptures. These results suggest that operative treatment of Achilles tendon injury may be cost-effective at low-cost centers and for high wage earning individuals. Furthermore, operative treatment is cost-effective if it produces incrementally better function and quality of life relative to nonoperative management. The available literature is inconclusive regarding differences in function and quality of life between operative and nonoperative treatment. Further research is needed to evaluate the quality of life benefits associated with operative and non-operative treatment of Achilles tendon injury.