Operative and Nonoperative Treatment of Lateral Compression Type 1 Pelvic Fractures: A Cost-Effectiveness Analysis

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INTRODUCTION:

Lateral compression type 1 (LC1) fractures are the most common type of pelvic fractures, with studies demonstrating that they account for nearly two-thirds of all pelvic fractures. Historically, LC1 fractures have been difficult to manage and there has been controversy over whether patients should be treated operatively or non-operatively. Traditionally, operative management has been reserved for treatment of unstable fractures to prevent displacement. Studies of operative management have demonstrated improved time to mobilization, decreased pain, and improved functional status in patients with LC1 fractures. However, while operative management has shown a trend toward improving quality of life (as measured by EQ-5D), recent systematic reviews have not found any statistical differences in length of hospital stay or complication rates between patients undergoing operative vs nonoperative management for LC1 fractures. Thus, the primary aim of this study is to perform a cost-effectiveness analysis comparing operative and non-operative management of LC1 pelvic fractures.

METHODS: Cost-effectiveness analysis will be carried out using Majeed Pelvic Score (MPS) and EQ-5D from the literature. The primary outcomes that will be assessed are the cost per meaningful change in MPS and the incremental cost-effectiveness ratio (ICER) based on EQ-5D outcome data at 6-week and 12-week time points. The decision tree model has been developed and analysis will be conducted via rollback analysis and Monte Carlo simulations.

RESULTS:

The rollback analysis revealed that compared to nonoperative treatment, both examination under anesthesia and operative treatment incurred significantly higher costs. Furthermore, the ICERs for these interventions surpassed the willingness-to-pay (WTP) threshold of $50,000, indicating that neither examination under anesthesia nor operative treatment is cost-effective when compared to nonoperative treatment.

DISCUSSION AND CONCLUSION:

While operative management of LC1 fractures has been associated with improved mobilization, decreased pain, and enhanced functional status, the cost-effectiveness analysis indicates that both examination under anesthesia and operative treatment are not cost-effective compared to nonoperative treatment at the 2 year time point. Our next steps will be examining 1, 2, 8 week, and 12-week data to evaluate whether operative management provides more cost-effective benefits in the perioperative period rather than at 2 years.

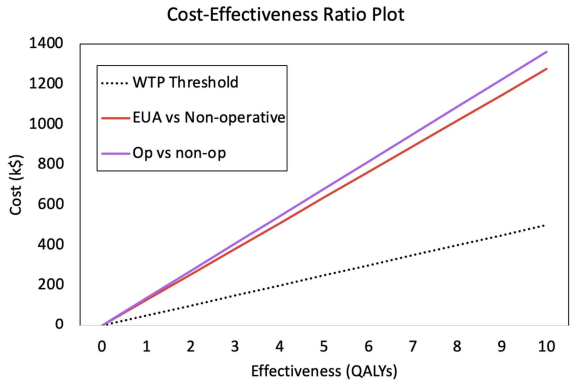

Figure 1. Cost-effectiveness ratio plot.

Exam under anesthesia (EUA) and operative treatment of LC1 fractures are not cost-effective at 2 years post-op. Both surpass the $50k WTP threshold.

Decision	Comparative cost	Incremental cost effectiveness ratio (ICER)
Nonoperative Treatment	-	-
Exam Under Anesthesia	+ $1175.66	-$127,510
Operative Treatment	+ $3722.92	-$136,095

Table 1. Rollback analysis results.