A Cost Analysis of Internal Fixation Versus Nonoperative Treatment in Adult Midshaft Clavicle Fractures Using Multiple Randomized Controlled Trials

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Background: Displaced, midshaft clavicle fractures in adults have been traditionally treated nonoperatively based on older data reporting low rates of nonunion. With more recent studies now showing superior functional outcomes with operative treatment, a trend toward initial surgical intervention is being seen. The cost of healthcare is under constant scrutiny and it is important for physicians to understand costs associated with our chosen interventions. We have sought to add to the existing data available by creating a unique economic analysis of the cost of operative versus nonoperative treatment from the perspective of a single payer. We hypothesize that the cost of nonoperative treatment, including those who require delayed operative treatment, will be less than those receiving initial operative management.

Methods: We identified four recent randomized controlled trials comparing operative and nonoperative treatment for displaced, midshaft clavicle fractures in adults with a minimum of one year follow up. A decision tree was then created from this data using reoperation for those treated with surgery or delayed operative treatment for those treated nonoperatively as endpoints. Actual costs estimated from 2013 Medicare reimbursement rates were applied and adjusted to better reflect private insurance rates. We then performed a 2-way sensitivity analysis to test the stability our model.

Results: Based on our decision tree, the expected costs for operative and nonoperative treatment were $14,763.21 and $3,112.65 respectively, producing a cost savings of $11,650.56 with nonoperative treatment. After application of a 2-way sensitivity analysis, our model remains valid until delayed operative treatment for nonoperative patients approaches 95% and reoperation after initial operative management falls below 15%.

Conclusions: From the perspective of a single payer, initial nonoperative treatment of midshaft clavicle fractures followed by delayed surgery as needed is more cost effective than initial operative fixation.

Level of Evidence: Economic and decision analysis, Level I