

Cost-Effectiveness for ORIF vs Total Elbow Arthroplasty for Distal Humerus Fractures



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INTRODUCTION

Total elbow arthroplasty (TEA) and open reduction internal fixation (ORIF) are both viable options for acute distal humerus fractures in non-arthritic patients >65 years old

Literature shows similar functional outcome scores, with TEA perhaps having decreased reoperation rates

However, no study evaluates the cost-effectiveness of each procedure

Objective: To compare the cost-effectiveness of TEA and distal humerus ORIF in this specific demographic

Hypothesis: TEA will be a more cost-effective procedure than ORIF for acute distal humerus fractures

METHODS

Indications: Acute comminuted distal humerus fractures treated with TEA or ORIF, >65yo at time of surgery, >2 year final follow up. **Contraindications:** >Grade I open fracture

A Markov model (Fig. 1) was constructed for a cost-utility analysis of TEA vs ORIF

Outcome probabilities and effectiveness were derived from the highest-level data available from the current literature

Quality adjusted life years (QALYs) for each outcome state calculated from EQ5D surveyed via telephone interview

Fig 1: Representative Markov model showing possible transition to different health states for ORIF

RESULTS

Telephone interview patients: ORIF 12 patients, TEA 11 patients

Study population was comparable to the recent literature in male:female ratio, elbow motion arc, MEPS

The *cost-effectiveness* of TEA and ORIF are similar in this demographic with mean slightly favoring TEA (Figure 2)

Though the upfront cost of TEA is higher, the mean first year cost is similar due to higher rate of first year ORIF revisions

In the first post-operative year, ORIF has more revision procedures resulting in lower utility (QALY) compared to TEA

The longer the patient lives, the more cost-effective ORIF becomes relative to TEA

Figure 1

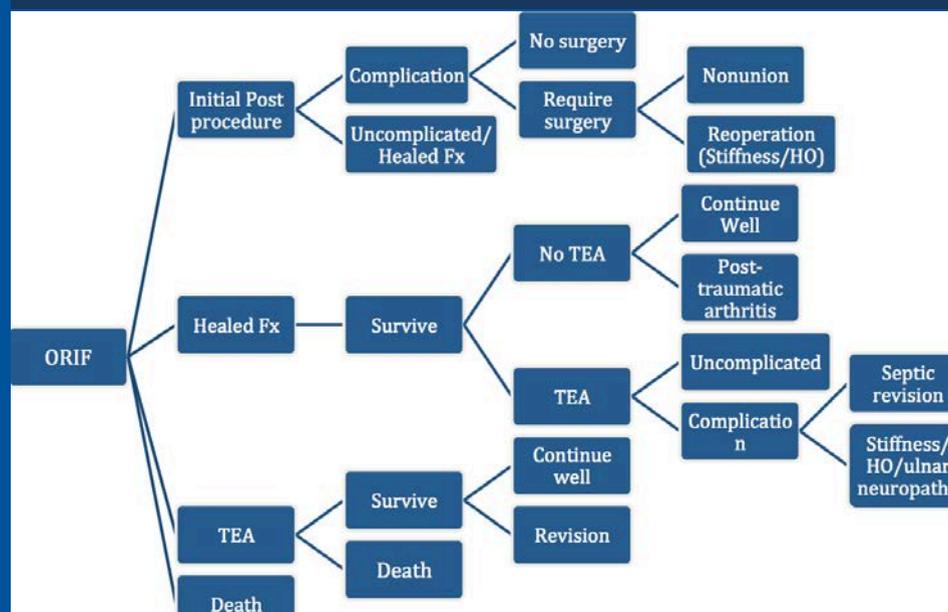


Figure 2

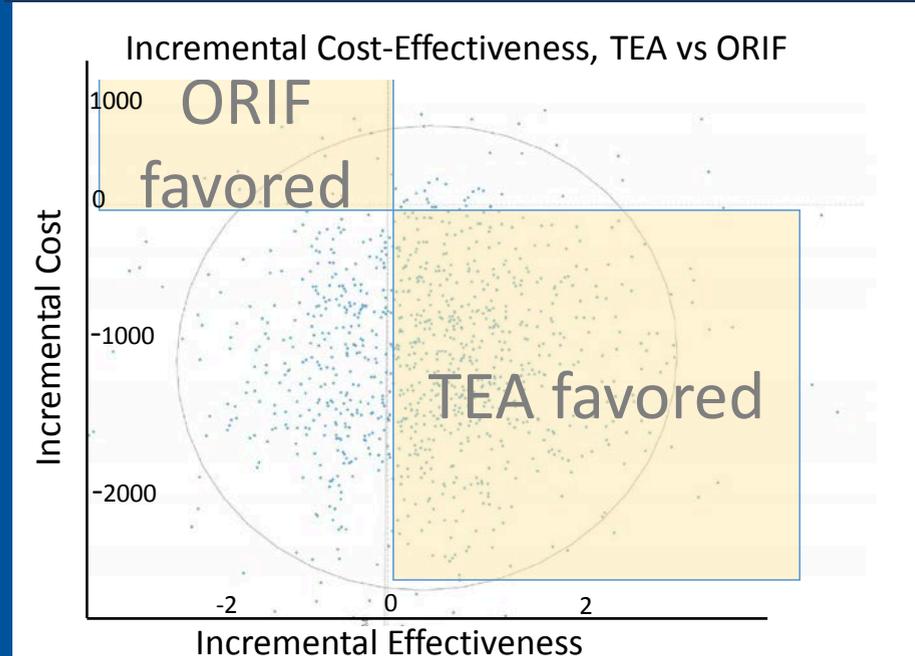


Fig 2: Incremental cost-effectiveness chart showing range of outcomes in simulation. There is a slight increase in cost effectiveness of TEA over ORIF.

CONCLUSIONS

While the cost-effectiveness is similar between TEA and ORIF, the mean slightly favors TEA

This difference is driven by the high upfront complication rate of ORIF and the shortened lifespan of this demographic

In patients with a shorter predicted lifespan, TEA holds more utility. For patients with higher expected longevity, ORIF would be predicted to eventually provide higher utility