

Cost-effectiveness of Proximal Femoral Nail Antirotation with versus without Cement Augmentation for Unstable Trochanteric Fractures

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BACKGROUND

A previous randomized controlled trial (RCT)³ showed a trend toward lower risk of revision surgery for unstable trochanteric fractures fixation using Proximal Femoral Nail Antirotation™ (PFNA) with TRAUMACEM™ V+ Injectable Bone Cement augmentation vs. fixation without augmentation (0% vs. 4.4%). This potential benefit may translate into long-term cost savings and improved quality of life.

OBJECTIVES

To assess the cost-effectiveness of TRAUMACEM V+ cement augmentation vs. no augmentation in unstable trochanteric fracture fixation using PFNA from the German healthcare payer's perspective.

METHODS

A two-stage cost-utility model was developed (Figure 1):

- A.** A decision tree that simulated clinical events, costs, and utilities over one year after the index surgery based on RCT³
- B.** A Markov model to extrapolate events over a lifetime horizon.

Model Inputs: The model was populated with data from the previous RCT,³ published literature and claims data.

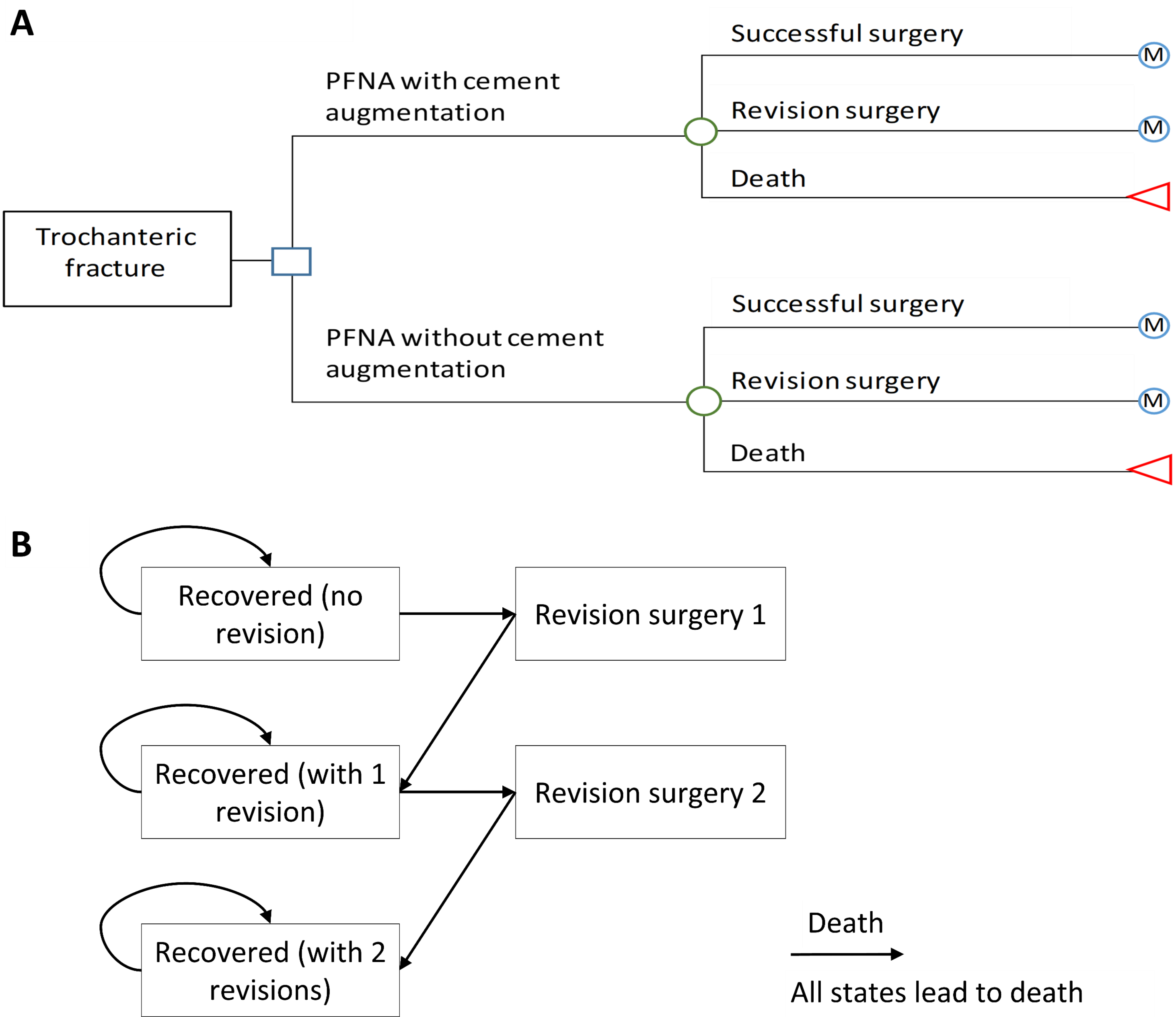
Model Outputs:

- Discounted costs (in 2020 Euros)
- Discounted quality-adjusted life years (QALYs) for effectiveness
- The incremental cost-effectiveness ratio (ICER) calculated as the incremental cost to gain an extra QALY (€/QALY) for fixation with augmentation compared with no augmentation.

Deterministic and probabilistic sensitivity analyses were conducted to assess model uncertainty.

METHODS (Cont'd)

Figure 1. Two-stage Model Structure: A. Decision Tree, B. Markov model



RESULTS

Base-case analysis:

Fixation with cement augmentation vs. no augmentation:

- Reduced mean total cost per patient by € 124.7 (€ 722.3 vs. € 847.0).
- Increased QALYs by 0.01 per patient (3.74 vs. 3.73 QALYs/patient).

Fixation with augmentation was the dominant strategy.

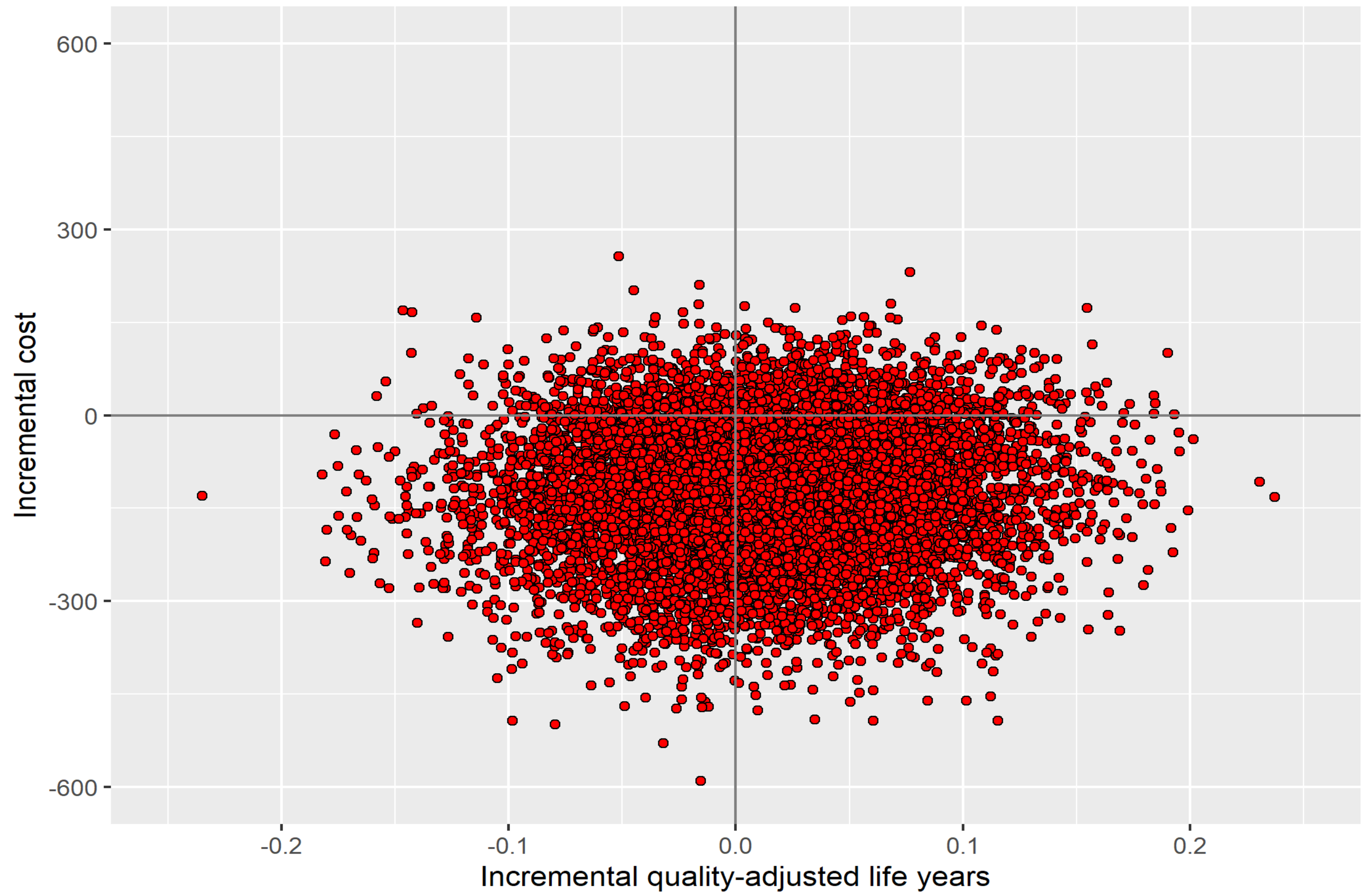
Sensitivity analyses:

Major influential parameters for ICER were mortality rate and revision rate in the first year, cement augmentation costs and revision surgery costs. Probabilistic sensitivity analysis: fixation was associated with lower costs and increased QALYs in 88.1% and 59.4% of the 10,000 simulations, respectively (Figure 2).

RESULTS (Cont'd)

Fixation with cement augmentation was more likely to be cost-effective than without augmentation regardless of the willingness-to-pay threshold.

Figure 2. Incremental cost-effectiveness scatterplot comparing fixation with cement augmentation versus fixation without augmentation.



CONCLUSIONS

- Based on an RCT with low revision rates, fixation using PFNA with TRAUMACEM V+ cement augmentation dominated fixation without augmentation for unstable trochanteric fracture, resulting in cost savings and QALY gains.
- Estimates of cost savings were more robust than those of increased QALYs given parameter uncertainties.

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