

Cost-Effectiveness Analysis: Robotic versus Open Transversus Abdominis Release (TAR) for Ventral Hernia Repair

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INTRODUCTION

- Transversus abdominis release (TAR)** is a well-established repair technique for large hernia defects.
- Two major surgical options:
 - Robotic TAR (rTAR):** MIS approach associated with reduced complications and shorter length of stay (LOS).
 - Open TAR (oTAR):** Conventional approach with higher complication rates and longer LOS but lower operative costs.
- Objective:** To evaluate the cost-effectiveness of rTAR compared with oTAR for ventral hernia repair.

METHODS

- Via decision model analysis, the clinical and economic outcomes of rTAR and oTAR were evaluated.
- The primary outcome was quality-adjusted-life-years (QALYs).
- The incremental cost-effectiveness ratio (ICER, ratio of increase in cost per increase in QALY) was determined, and a willingness-to-pay (WTP) threshold of \$150,000/QALY was utilized.
- Probabilities and costs of complications and costs of each operative approach were derived from published literature.
- Sensitivity analyses were performed to understand the impact of each variable on the outcome of interest.

RESULTS

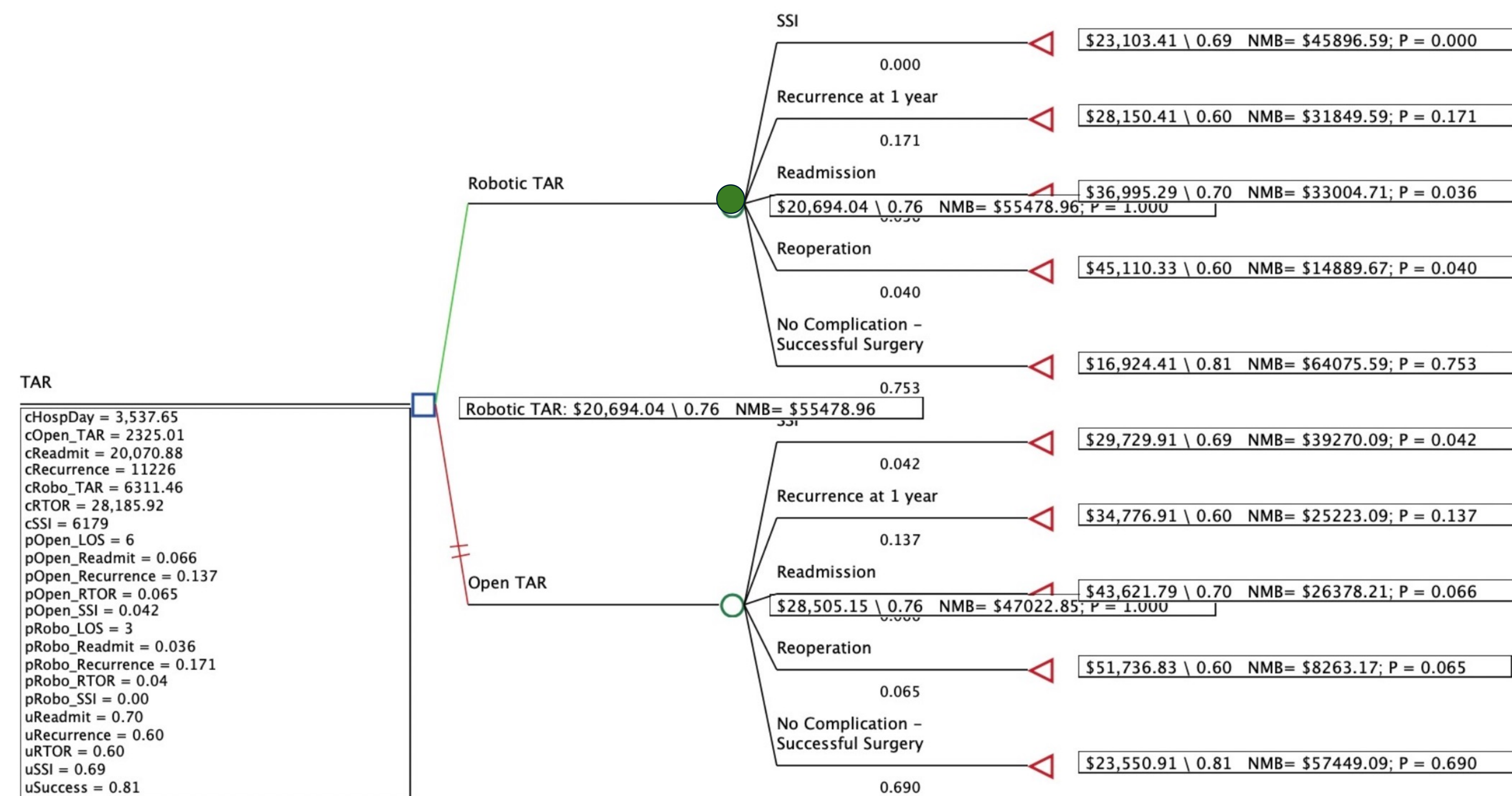


Figure 1. Decision tree analysis comparing rTAR with oTAR. The green shaded circle indicates that the rTAR arm is the more cost-effective strategy

CONCLUSIONS

- Despite the higher cost of rTAR, lower complications and length of stay make it the more dominant, cost-effective strategy compared to oTAR for the treatment of ventral hernias.
- In order for oTAR to be the more cost-effective strategy, recurrence rates must be substantially outside the range of feasibility for rTAR (3-10%).
- These findings support the trend towards minimally invasive hernia repair from both clinical and economic perspectives.

- rTAR was less costly (\$20,690 vs \$28,510) and more effective (0.77 QALY vs 0.76 QALY) than oTAR (**Figure 1**)
- One-way (deterministic) sensitivity analysis demonstrated that rTAR remained cost-effective as long as its length of stay remained shorter than oTAR; oTAR only approached cost-effectiveness when rTAR recurrence increased to ~32%
- Probabilistic sensitivity analysis using Monte-Carlo simulation showed that the majority of simulations (>95%) favored rTAR as the more cost-effective strategy

