Complex Ventral Hernia Repair Using Components Separation With Or Without Synthetic Mesh: A Cost Utility Analysis

Background:

Complex ventral hernias can be repaired using a variety of techniques depending on the degree of contamination present. In cases with minimal contamination, the use of synthetic mesh in addition to performing components separation is an area of controversy. A technology that potentially provides clinical benefit yet incurs a cost is ideally suited for cost utility analysis (1, 2), and such an analysis of synthetic mesh with components separation has not been previously undertaken.

Methods:

A literature review was conducted to identify published short and long term complications and recurrence rates for complex ventral hernia repairs in minimally contaminated fields (Ventral Hernia Working Group grades 1 and 2) (3) requiring open components separation with or without synthetic mesh. Short term complications included: wound infection, wound dehiscence/mesh erosion, seroma, and hematoma; and long term complications included: abdominal bulge/laxity, small bowel obstruction, and enterocutaneous fistula. The average probability of each complication was combined with Medicare Current Procedural Terminology (CPT) reimbursement codes, Diagnosis Related Groups (DRG) reimbursement codes, and 11 expert utility estimates to fit into a decision tree model to evaluate the comparative effectiveness of using synthetic mesh.

Results

Our literature review resulted in 11 papers describing 403 complex ventral hernias repaired with components separation alone and 6 papers describing 361 complex ventral hernias repaired using components separation with synthetic mesh. The addition of synthetic mesh to components separation allowed for lowered early and late complications and decreased hernia recurrence which resulted in a superior clinical outcome based on an increase in the quality adjusted life years (QALYs) with synthetic mesh. The incremental cost utility ratio (ICUR) for using synthetic mesh was $22.41/QALY indicating cost effectiveness based on a previous published and empirically accepted cost effectiveness threshold of $50,000/QALY. When the average retail cost of synthetic mesh ($3/cm²) was used in place of Medicare reimbursement ($268.66), the ICUR increased to $15,173.39/QALY but remained cost effective. Our sensitivity analysis revealed that synthetic mesh is cost effective when it costs less than $2,049.97 (regardless of size).

Conclusion

From a hospital and third party payer perspective, the addition of synthetic mesh when performing components separation in repairing complex ventral hernias is cost effective relative to reconstructions without it. Synthetic mesh remains cost effective as long as its cost is less than $2,049.97.
