The Use of Mesh Versus Primary Fascial Closure of the Abdominal Donor Site When Using a Transverse Rectus Abdominus Myocutaneous (TRAM) Flap for Breast Reconstruction: A Cost-Utility Analysis

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Abstract

Background:

During breast reconstruction with the use of the transverse rectus abdominus myocutaneous (TRAM) flap, the use of mesh for abdominal donor site closure provides for a technology that potentially provides clinical benefit yet incurs an added cost. When technology creates clinical benefit with added cost, a cost-utility analysis can be used to assess if this technology is cost-effective.(1-5) Our goal was to determine if it is cost-effective to use mesh during abdominal donor site closure when performing a TRAM flap for breast reconstruction.

Methods:

A comprehensive literature review was conducted to identify and pool published hernia and bulge rates at abdominal TRAM flap donor sites closed either primarily or with mesh. A decision tree analysis was performed. (Figure 1) Outcome probabilities, costs of complications and expert utility estimates were populated into the decision tree model to evaluate the cost-utility of using mesh in TRAM abdominal donor site closure. One-way sensitivity analyses were performed verify the robustness of the results.

Results

Our literature review resulted in 10 papers describing 1195 patients who had TRAM abdominal donor site closure primarily and 696 patients who had TRAM abdominal donor site closure performed with mesh with pooled hernia/bulge complication rates of 7.87% and 4.45% respectively. The use of mesh was more clinically effective based on a total quality adjusted life years (QALY) gained of 30.53 compared to 30.41 when performing primary fascial closure alone. The incremental additional cost incurred by the mesh arm when running the decision tree model was $693.14. This difference in cost divided by the difference in clinical efficacy (0.12) equals an incremental cost-utility ratio (ICUR) value of $5,776.17 per QALY gained when using mesh making it cost-effective (when using a willingness to pay threshold of $50,000). One-way sensitivity analysis revealed that using mesh was cost effective when the price of mesh was equal to or less than $5,970 or led to a hernia/bulge rate equal to or less than 7.25%. Primary facial closure was cost-effective when its use leads to a hernia/bulge rate equal to or less than 4.75%.

Conclusion

The use of mesh when repairing the abdominal donor site during a pedicled or free TRAM flap breast reconstruction is cost-effective when compared to primary fascial closure alone.

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