

Cost-effectiveness of a Radio Frequency Hemostatic Sealer (RFHS) in Adult Spinal Deformity surgery- The Aquamantys Cost-Effectiveness (ACE) Study

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Introduction

Patients undergoing posterior spinal fusion surgery can lose substantial amount of blood. This can prolong operative time and require transfusion of allogeneic blood components which increases the infection risk and can be the harbinger of serious complications. Does a saline-irrigated radiofrequency bipolar hemostatic sealer (RFHS), help reduce transfusion requirements?

Methods

In an observational cohort study, we compared transfusion requirements in 30 patients undergoing surgery for adult spinal deformity utilizing the Aquamantys® hemostatic vessel sealer, (Medtronic, Minneapolis, MN, USA) to that of a historical control group of 30 patients in which traditional hemostasis was obtained with bipolar electrocautery, and matched them for blood loss related variables. Total expense to the hospital for the RFHS, lab expenses and blood transfusions was used for cost calculations. The incremental cost effectiveness ratio was calculated using the number of blood transfusions avoided, as the effectiveness payoff.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of studying value of new technology, 2) Discuss, in small groups, the role of cost-effectiveness studies applied to expensive tools we decide to adapt in neurosurgery 3) Identify a methodology to study effectiveness of a radio frequency hemostatic bipolar in spine surgery.

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Results

Using a multivariable linear regression model, only EBL was found to be an independent significant predictor of transfusion requirement in both groups. We evaluated the variables of age, EBL, time duration of surgery, pre-op Hb, Hb nadir during surgery, BMI, LOS and number of levels operated on. Mean EBL was higher in the control group (2201 vs. 1416 ml, $p=0.0099$). The number of transfusions were also higher in the control group (14.5 vs. 6.5, $p=0.0008$). In the cost-effectiveness analysis we found that the RFHS cost \$108 more (compared to not using the RFHS) to avoid one unit of blood transfusion.

Conclusions

The cost-effectiveness analysis revealed that if we are willing to pay \$108 to avoid one unit of blood transfusion, the use of the RFHS was a reasonable choice to use in open surgery for adult spinal deformity.