Cost-utility Analysis of Scleral Buckle versus Pars Plana Vitrectomy versus Pars Plana Vitrectomy with Scleral Buckle for Moderately Complex Retinal Detachment Repair

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Purpose:
To compare the cost-utility for surgical treatment of moderately complex rhegmatogenous retinal detachment (RRD) using scleral buckle (SB), pars plana vitrectomy (PPV) and PPV with SB (PPV/SB), utilizing the Primary Retinal detachment Outcomes (PRO) Study phakic cohort.

Methods:
A decision analysis model based on use of the published results from the PRO Study analyzed costs, lifetime utility, and lifetime cost per quality-adjusted life year (QALY) for the treatment of moderately complex RRD with SB, PPV or PPV/SB. Given that the PRO Study phakic sub-group chosen for analysis was a cohort of comparable cases of moderately complex RRD, value comparisons between surgical methods can be made. Cost data for the procedures and care were based on Centers for Medicare and Medicaid Services allowables to calculate the adjusted costs in facility and non-facility settings. Lifetime calculations were based on Social Security Administration actuarial tables. Main outcomes included cost of intervention, visual acuity-determined utility gain over natural history, QALY gained, and cost per QALY for each surgical approach.

Results:
The total costs (in 2020 US dollars) for primary repair of a moderately complex RRD in facility (non-facility) settings were $5975 ($3774) in the SB group, $8125 ($5082) in the PPV group, and $7551 ($4713) in the PPV/SB group. The estimated lifetime QALYs gained were 5.4, 4.7, and 4.7, respectively. The cost per QALY for facility (non-facility) settings was $1102 ($696) in the SB group, $1714 ($1072) in the PPV group, and $1593 ($994) in the PPV/SB group.

Conclusions:
Repair of moderately complex RRD with SB, PPV and PPV/SB all yielded very favorable cost-utility results, and compares favorably with better-eye epiretinal membrane surgery ($4,680/QALY) and exudative macular degeneration treatment with ranibizumab ($45,995/QALY). Of the three procedures studied here, slightly more favorable results were found for SB.