

# INPLASY

## Scleral Buckling versus Pars Plana Vitrectomy for Primary Pseudophakic Retinal Detachment: A Systematic Review and Meta-analysis

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### ADMINISTRATIVE INFORMATION

**Support** - None.

**Review Stage at time of this submission** - The review has not yet started.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202650127

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 May 2026 and was last updated on 23 May 2026.

### INTRODUCTION

**Review question / Objective** To compare the anatomical success and postoperative complications of scleral buckling (SB) versus pars plana vitrectomy (PPV) in the primary repair of pseudophakic retinal detachment (PRD).

**Rationale** PRD is an increasingly common condition in the era of modern cataract surgery and presents unique surgical challenges. Although SB and PPV are the two principal surgical approaches, their comparative effectiveness remains controversial. Previous studies and meta-analyses have reported inconsistent findings, often limited by heterogeneous study designs and inclusion of mixed patient populations. Therefore, an updated systematic review and meta-analysis focusing on primary PRD is warranted.

**Condition being studied** Pseudophakic retinal detachment (PRD).

### METHODS

**Search strategy** Two reviewers independently conducted electronic searches in PubMed and Embase using the following search terms: (“pseudophakic” OR “intraocular lens”) AND (“scleral buckling”) AND (“vitrectomy”). Searches were performed from database inception to December 13, 2025.

**Participant or population** Adult human participants diagnosed with pseudophakic or aphakic retinal detachment undergoing primary surgical repair.

**Intervention** Scleral Buckling.

**Comparator** Pars Plana Vitrectomy.

**Study designs to be included** Randomized controlled trials and observational cohort studies.

**Eligibility criteria** Inclusion criteria:

1. Studies involving human participants.
2. Adult patients with pseudophakic or aphakic retinal detachment.
3. Patients undergoing primary surgery for retinal detachment.
4. Studies comparing SB and PPV.
5. Reporting anatomical success rates.

Exclusion criteria:

1. Full text unavailable.
2. Non-English publications.
3. PVR stage greater than grade B.
4. Follow-up duration < 6 months.
5. Previous retinal detachment surgery or recurrent cases.
6. Overlapping populations.

**Information sources** Two reviewers independently conducted electronic searches in PubMed and Embase using keywords related to pseudophakic retinal detachment, scleral buckling, and pars plana vitrectomy from database inception to December 13, 2025.

**Main outcome(s)** The primary outcome is anatomical success, defined as retinal reattachment after surgery, with data preferentially extracted at 6 months postoperatively.

**Additional outcome(s)** Secondary outcomes include postoperative complications, specifically proliferative vitreoretinopathy, cystoid macular edema, and macular pucker.

**Data management** Two independent reviewers will extract data using a standardized form, including study characteristics, patient demographics, surgical details, and outcome measures. Discrepancies will be resolved through discussion and consensus, with a third reviewer consulted when necessary. Corresponding authors will be contacted if data are missing.

**Quality assessment / Risk of bias analysis** The methodological quality of included studies will be independently assessed by two reviewers. The Cochrane Risk of Bias tool (RoB 2) will be used for randomized controlled trials, and the Newcastle–Ottawa Scale (NOS) will be applied for cohort studies. Discrepancies will be resolved through discussion and consensus. For the RoB 2 assessment, the intervention assignment approach will be adopted, as it is considered appropriate for the design of the included studies.

**Strategy of data synthesis** Meta-analysis will be conducted using a random-effects model, with effect sizes expressed as odds ratios (ORs) with corresponding 95% confidence intervals (CIs), and

statistical heterogeneity assessed using the  $I^2$  statistic.

**Subgroup analysis** Subgroup analyses will be performed based on intraocular lens status (pseudophakic-only vs mixed populations).

**Sensitivity analysis** Sensitivity analyses will be performed using a one-study removal method.

**Language restriction** English.

**Country(ies) involved** Taiwan.

**Keywords** pseudophakia; rhegmatogenous retinal detachment; scleral buckle; vitrectomy; meta-analysis; proliferative vitreoretinopathy; cystoid macular edema.

#### **Contributions of each author**

Author 1 - Wei-Chiao Kao.

Author 2 - Chien-Te Liu.

Author 3 - Chi-Chih Chan.

Author 4 - Yung-Shun Tsai.

Author 5 - Chin-Te Huang.