

Macular Buckling for Myopic Traction Maculopathy: A Comprehensive Systematic Review and Meta-Analysis

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INTRODUCTION

- MM is one of the very serious complications of myopia, causing significant visual impairments and blindness ranging from 12 to 27% in Asian populations and 7% in Western populations.¹
- Myopic Traction Maculopathy (MTM) is a subset of MM, leading to vision impairment due to conditions like maculoschisis, foveal detachment, and macular holes.²
- Surgical treatments include pars plana vitrectomy (PPV) and macular buckling (MB).
- MB is an ab externo procedure that aims to alleviate traction forces by using a buckle around the eye, effectively counteracting forces responsible for MTM.
- Although MB has shown promising results, consensus on its efficacy remains unclear due to limited studies

OBJECTIVES

- To evaluate the outcomes of macular buckling for myopic traction maculopathy through a systematic review and meta-analysis.
- To assess changes in best-corrected visual acuity (BCVA), axial length, retinal reattachment rate, and macular hole closure rate after MB.
- To analyze short-term, mid-term, and long-term outcomes of MB for MTM.

METHODS

- Systematic review following PRISMA guidelines³
- Searched PubMed, Cochrane Library, and EMBASE databases
- 13 studies analyzed (482 myopic eyes)
- Meta-analysis conducted using random-effects models, heterogeneity assessed using I^2 statistics
- Publication bias assessed by funnel plots and Doi plots with Luis Furuya-Kanamori (LFK) index

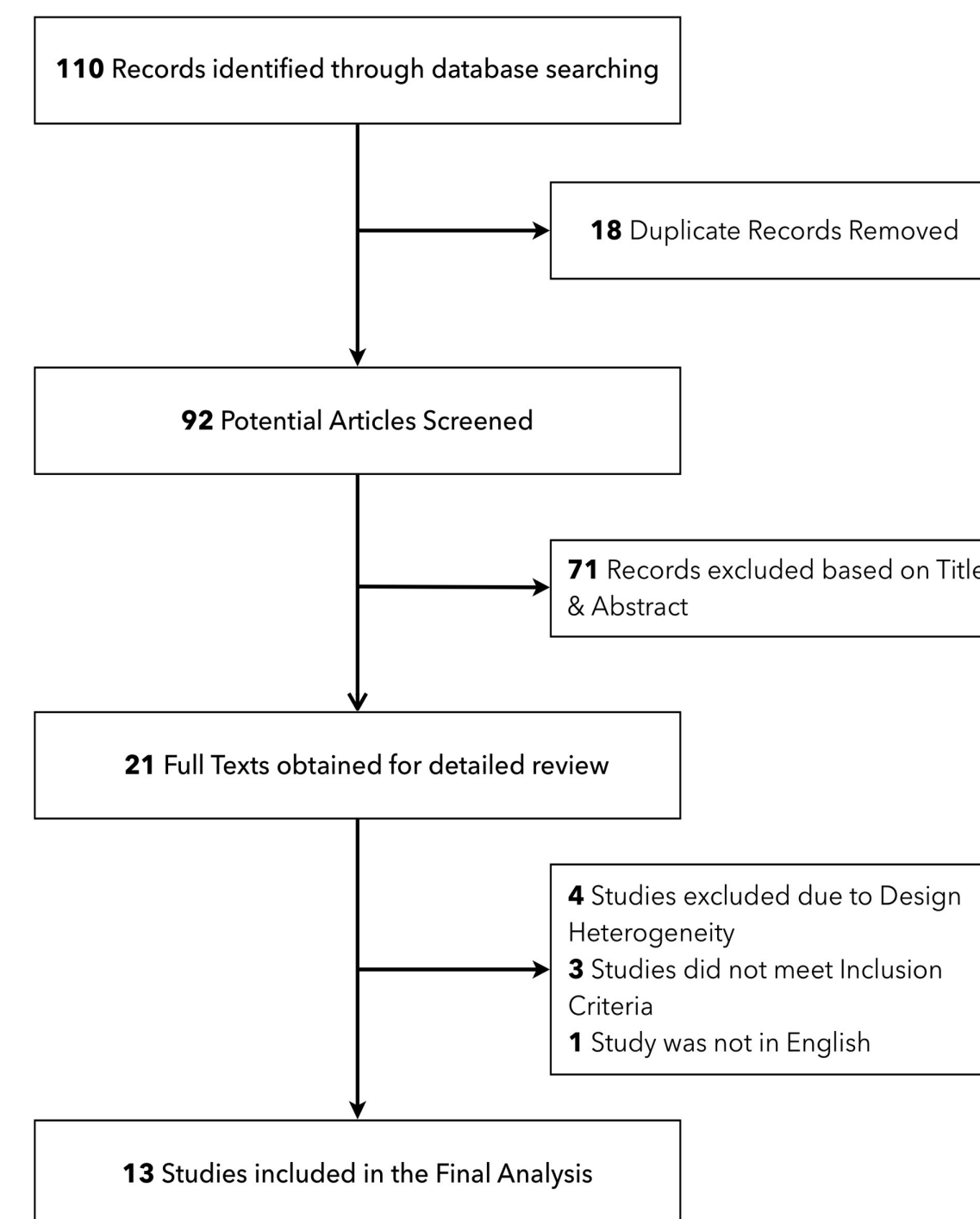


Figure 1: PRISMA Flow Diagram

RESULTS

- BCVA improved significantly (long-term: 0.38 logMAR units, 95% CI: 0.28 to 0.47)
- Axial length reduced consistently (long-term: 2.88 mm, 95% CI: 2.54 to 3.21)
- Long-term retinal reattachment rate: 94% (95% CI: 86-97%)
- Long-term macular hole closure rate: 72% (95% CI: 55-85%)

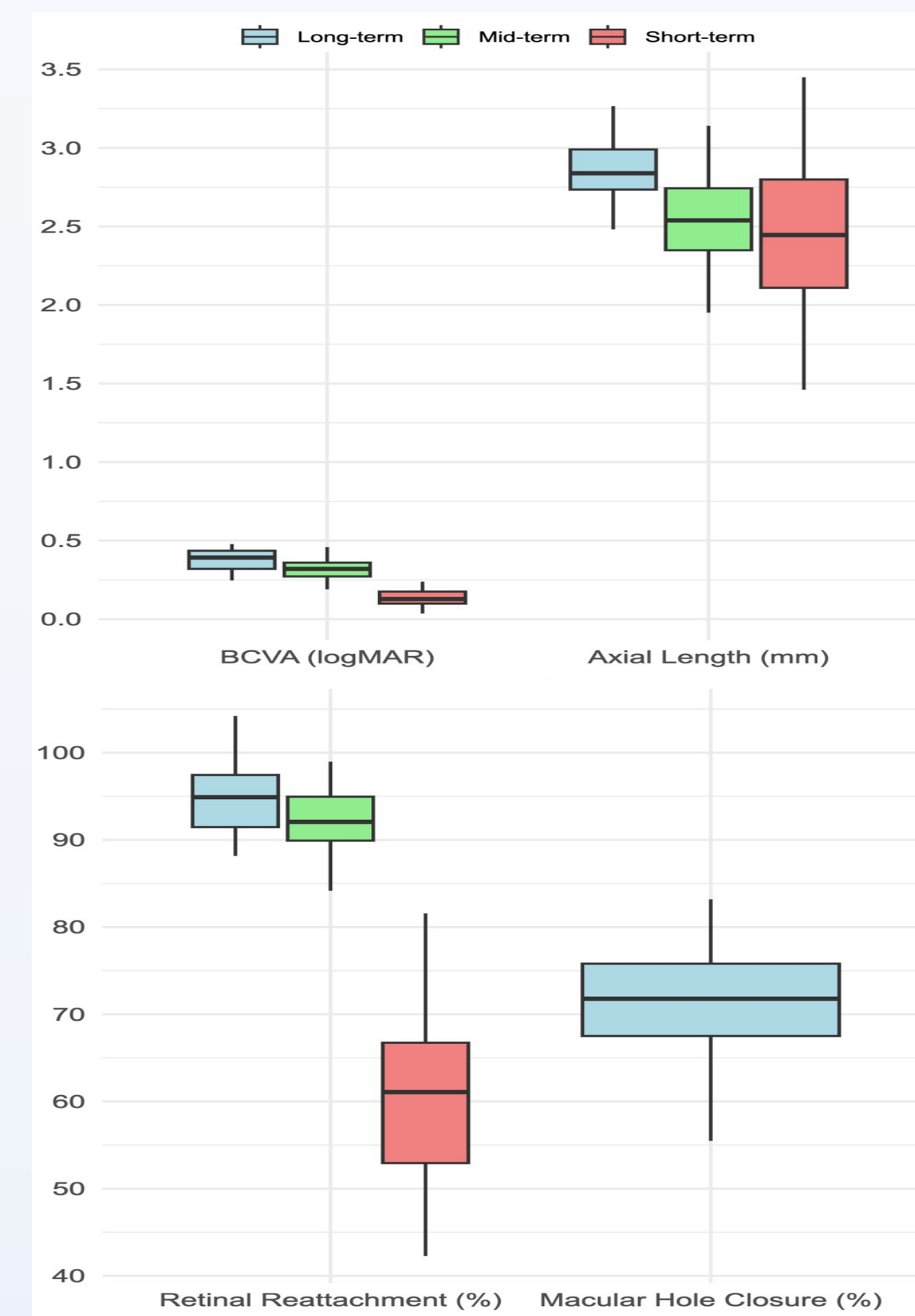


Figure 2: BoxPlot Overview of Results

CONCLUSIONS

- Macular buckling surgery provides significant improvements in visual acuity, with a durable long term reduction in axial length for myopic traction maculopathy (MTM) patients.
- Long-term outcomes show a considerable increase in retinal reattachment rate and macular hole closure rate, supporting its efficacy as a treatment option.
- While variability exists across studies, macular buckling remains a promising alternative to traditional approaches like pars plana vitrectomy (PPV).
- Further research is needed to standardize surgical techniques and explore combination therapies to optimize patient outcomes and ensure consistent results.

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