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Treatment Outcomes of Different Incision Extents of Ab Interno Trabeculotomy for Open-Angle Glaucoma: A Protocol for a Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION**Support** - No support.**Review Stage at time of this submission** - Completed but not published.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY2026100085

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 20 October 2026 and was last updated on 20 October 2026.

INTRODUCTION

Review question / Objective This systematic review and meta-analysis aimed to evaluate the treatment effects and safety of ab interno trabeculotomy across different incision extents in adults with open-angle glaucoma, and to explore study-level associations between incision extent and postoperative outcomes, including potential nonlinear associations.

Condition being studied Open-angle glaucoma (OAG) is a progressive optic neuropathy characterized by damage to the optic nerve and is a leading cause of irreversible blindness worldwide. Elevated intraocular pressure, partly attributable to increased resistance to aqueous humor outflow through the trabecular meshwork, is an important modifiable risk factor for disease progression. Ab interno trabeculotomy is a minimally invasive glaucoma surgery that improves aqueous humor outflow by incising the trabecular

meshwork. This review focuses on OAG in adults undergoing ab interno trabeculotomy, with an emphasis on clinical outcomes associated with different incision extents.

METHODS

Participant or population Adults aged 18 years or older diagnosed with open-angle glaucoma.

Intervention Ab interno trabeculotomy performed with varying incision extents.

Comparator Different incision-extent categories of ab interno trabeculotomy: $\leq 120^\circ$, 121° – 180° , 181° – 359° , and 360° .

Study designs to be included Original clinical studies, including randomized controlled trials, prospective and retrospective observational studies, and non-randomized interventional studies.

Eligibility criteria Studies involving adults with open-angle glaucoma who underwent ab interno trabeculotomy were eligible if they reported relevant clinical outcomes and provided sufficient information on incision extent. Studies with a sample size of fewer than 10, or involving previous incisional surgery that substantially affected aqueous outflow, were excluded. Studies that did not clearly report incision extent were also excluded. Reviews, case reports, editorials, and animal studies were excluded.

Information sources MEDLINE, Embase, Web of Science, China National Knowledge Infrastructure, Wanfang Data, and VIP.

Main outcome(s) The primary outcome was the percentage reduction in intraocular pressure (IOP) from baseline at ≥ 12 months after surgery. Secondary outcomes included postoperative IOP, IOP-lowering medication use, postoperative complications (including hyphema, hyphema requiring intervention, and IOP spikes).

Quality assessment / Risk of bias analysis The methodological quality of observational studies was assessed using the Newcastle–Ottawa Scale. Risk of bias in randomized controlled trials was assessed using the Cochrane Risk of Bias 2 tool, while non-randomized interventional studies were assessed using the Risk Of Bias In Non-randomized Studies of Interventions tool.

Strategy of data synthesis Random-effects meta-analyses will be performed when data from at least two studies are available for an outcome. Continuous outcomes will be pooled using the inverse-variance method, and dichotomous outcomes will be synthesized as pooled proportions. Where quantitative synthesis is not feasible, descriptive synthesis will be used. Between-study heterogeneity will be assessed using the I^2 statistic. Meta-regression and restricted cubic spline analyses will be used to explore potential linear and nonlinear associations between incision extent and clinical outcomes. Publication bias will be assessed for the primary outcome, percentage reduction in IOP from baseline at ≥ 12 months, using funnel plots and Egger's regression test. Statistical analyses will be performed using R, with a two-sided P value < 0.05 considered statistically significant.

Subgroup analysis Subgroup analyses will be conducted according to glaucoma type (primary open-angle glaucoma vs. secondary open-angle glaucoma) and surgical approach (standalone ab interno trabeculotomy vs. ab interno

trabeculotomy combined with phacoemulsification). Outcomes will also be analyzed across four incision-extent categories: $\leq 120^\circ$, 121° – 180° , 181° – 359° , and 360° . Between-group differences will be assessed using Cochran's Q test, where applicable.

Sensitivity analysis None.

Country(ies) involved China.

Keywords Ab interno trabeculotomy; Incision extent; Meta-analysis; Open-angle glaucoma.

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