بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / حسام الدين محمد مغربي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

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Pars Plana Vitrectomy for Treatment of Diabetic Macular Edema with or Without Internal Limiting Membrane Peeling: A Systematic Review and Meta-Analysis

Thesis

Submitted for Partial Fulfillment of
Master Degree in **Ophthalmology**

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Cairo, Egypt, 2021

سورة البقرة الآية: ٣٢

Acknowledgments

First and foremost, I feel always indebted to ***Allah*** *the Most Beneficent and Merciful.*

I wish to express my deepest thanks, gratitude and appreciation to ***Prof. Dr. Abdelrahman Gaber Salman****, Professor of Ophthalmology, Faculty of Medicine, Ain Shams University, for his meticulous supervision, kind guidance, valuable instructions and generous help.*

Special thanks are due to ***Dr. Mohamed Abdel Hakim Zaki****, Assistant Professor of Ophthalmology, Faculty of Medicine, Ain Shams University, for his sincere efforts, continuous encouragement.*

I am deeply thankful to ***Dr. Heba Mohammed Abdel Haleem****, Lecturer of Ophthalmology, Faculty of Medicine, Ain Shams University, for her great help, outstanding support, active participation and guidance.*

Really I can hardly find the words to express my gratitude to ***Dr. Moustafa EL Hussieny Moustafa****, Professor Emeritus, Department of Community, Environmental and Occupational Medicine, Faculty of Medicine, Ain Shams University, for his supervision, continuous help, encouragement throughout this work.*

I would like to express my hearty thanks to all my family for their support till this work was completed.

Omar Khairy Abd El-Hamied

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List of Abbreviations

Abb.	Full term
Anti-VEGF	Anti-vascular endothelial growth factor
BCVA	Best corrected visual acuity
BRB	Blood retinal barrier
CME	Cystoid macular edema
CMT	Central Macular Thickness
CPM	Cuts per minute
CSME	Clinically significant macular edema
CST	Central subfield thickness
CVI	Choroidal vascularity index
DD	Disc diameter
DME	Diabetic macular edema
DR	Diabetic retinopathy
DRIL	Disorganization of retinal inner layers
DRT	Diffuse retinal thickening
ELM	External limiting membrane
ERM	Epiretinal membrane
ETDRS	Early Treatment of Diabetic Retinopathy Study
EZ	Ellipsoid zone
FAF	Fundus autofluorescence
FDA	Food and Drug Administration
FEM	Fixed-effects method
FFA	Fundus Fluorescein Angiography
HCF	Hyperreflective choroidal foci
HRF	Hyperreflective retinal foci
I^2	Inconsistency
ILM	Internal limiting membrane
IS/OS	Inner segment/outer segment
IVTA	Intra-Vitreal Triamcenilone injection

List of Abbreviations cont...

Abb.	Full term
MLP	Macular laser photocoagulation
NIR	Near-infrared
NPDR	Non-proliferative diabetic retinopathy
OCT	Optical coherence tomography
ONL	Outer nuclear layer
PDR	Proliferative diabetic retinopathy
PHT	Posterior hyaloidal traction
PPV	Pars plana vitrectomy
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PROS	Photoreceptor outer segment
PRP	Pan-retinal photocoagulation
PVD	Posterior vitrous detachement
RCTs	Randomized controlled clinical trials
REM	Random-effects method
RNFL	Retinal nerve fiber layer
RPE	Retinal nerve fiber layer
SD	Standard deviation
SE	Standard error
SML	Subthreshold micro-pulse laser
SRD	Serous retinal detachment
STTA	Sub-Tenon Triamcenilone injection
TPHM	Tout posterior hyaloid membrane
VMI	Vitreomacular interface
VMT	Vitreomacular traction

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INTRODUCTION

Diabetic retinopathy (DR) is a common and progressive microvascular complication that develops in approximately 35% of diabetic patients over time ***(Tan et al., 2017).*** It is a major cause of blindness and visual impairment among diabetic patients and ranked as the fifth most common cause of preventable blindness and fifth most common cause of moderate to severe visual impairment ***(Bourne et al., 2005)***.

Flaxman et al. (2017) estimated that among the global population with moderate or severe vision impairment in 2015 about 2.6 million people were visually impaired because of DR, and expected to rise to 3.2 million in 2020. DR can be classified clinically into two forms non-proliferative diabetic retinopathy (NPDR) and proliferative diabetic retinopathy (PDR)**.**

Diabetic macular edema (DME) is caused by accumulation of excess fluid and lipid in the macula due to a disruption of blood retinal barrier (BRB). Disruption of BRB by breakdown of intercellular junctions between endothelial cells, pericyte loss and basement membrane thickening. Breakdown of intercellular junctions results in leakage of red cells, plasma and lipid. Pericyte loss leads to focal endothelial cell proliferation and microaneurysms formation ***(Cindy et al., 2017).***

Many modalities of treatment have been developed to treat DME either nonsurgical or surgical procedures. Nonsurgical treatments for DME have included focal and grid macular laser photocoagulation (MLP), Sub-Tenon Triamcenilone injection (STTA), Intra-Vitreal Triamcenilone injection (IVTA), and intravitreal injection of anti-vascular endothelial growth factor (anti-VEGF) agents ***(Zur et al., 2020)***. Surgical treatment considered vitrectomy when no response to nonsurgical treatments or in DME patients with epiretinal membrane or vitreomacular traction ***(Kim et al., 2018)***.

The retinal internal limiting membrane (ILM) is a basement membrane that defines the boundary between the vitreous and the retina. It consists of the internal expansions of Müller cells and a meshwork of glycosaminoglycans, collagen fibers, laminin and fibronectin called the cuticular layer ***(Semeraro et al., 2015)***.

Müller cells can migrate to the inner surface of the ILM and form a membranous contraction structure, resulting in the contractile force in tangential direction. As a basement membrane, ILM can serve as a framework for cell proliferation and is often involved in diseases that affect the vitreomacular interface ***(Stolba et al., 2005; Xin-Ying et al., 2018).***

The significance of ILM peeling has been investigated in surgical management of DME. Several scholars stated a positive effect of ILM peeling during vitrectomy for DME. It has been hypothesized that ILM peeling has more favorable anatomical and visual results**.** However, some studies have reported minimal improvement of VA outcomes compared to baseline ***(Gandorfer et al., 2000)*****.**

Aim of the Study

The aim of the study was to conduct a systematic review and a meta-analysis estimating the efficacy of pars plana vitrectomy with and without internal limiting membrane peeling in treating non tractional refractory diabetic macular edema.