بسم الله الرحمن الرحيم

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

ملاحظات: ....

Incidence, causes, and management of post vitrectomy endophthalmitis: a meta-analysis study

A meta-analysis study

Submitted in partial fulfillment of the Master Degree in Ophthalmology

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Pola Nageh

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List of Abbreviations

Abb.	Full term
Anti-VEGF	Anti- Vascular Endothelial Growth Factor
AVI	Advanced Visual Instrument
BCVA	Best Corrected Visual Acuity
BIOM	Binocular Indirect Opthalmomicroscope
CI	Confidence Intervals
CMA	Comprehensive Meta-Analysis
CME	Cystoid Macular Edema
CRVO	Central Retinal Vein Occlusion
DM	Diabetes Mellitus
DME	Diabetic Macular Edema
DORC	Dutch Opthalmic Research Center
DR	Diabetic Retinopathy
ERM	Epi Retinal Membrane
FFA	Fundus Fluorescein Angiography
G PPV	Gauge Pars Plana Vitrectomy
HM	Hand Motion
ILM	Internal Limiting Membrane
IOL	Intra Ocular Lens
IV	Intra Venous
IVB	Intra Vitreal Bevacizumab
IVI	Intravitreal Injection
IVTA	Intra Vitreal Trimamcinolone Acetonide injection
LogMAR	Logarithm of the Minimum Angle of Resolution
LP	Light Perception

List of Abbreviations Cont...

Abb.	Full term
MIVS	Micro-incision Vitrectomy Surgery
NHLBI	National Heart, Lung, and Blood Institute
NIH	National Institutes of Health
NLP	No Light Perception
NPDR	Non-Proliferative Diabetic Retinopathy
OR	Odds Ratio
PFCls	Perfluorocarbon Liquids
PPV	Pars Plana Vitrectomy
PVR	Proliferative Vitreoretinopathy
RD	Retinal Detachment
RPE	Retinal Pigment Epithelium
SF6	Sulfur hexafluoride
SFAs	Semifluorinated Alkanes
SFIOL	Scleral-fixated Intraocular Lens
SSADA	Split-spectrum Amplitude-decorrelation Angiography
TRD	Tractional Retinal Detachment
TSV	Transconjunctival Sutureless Vitrectomy
VA	Visual Acuity
VEGF	Vascular Endothelial Growth Factor
VH	Vitreous Hemorrhage
WHO	World Health Organization

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INTRODUCTION

Endophthalmitis is characterised by severe inflammation of the ocular tissues and fluids ***(Chen et al., 2010).***

Acute-onset postoperative infectious endophthalmitis is the most frequent category and may be associated with severe visual loss. The incidence of endophthalmitis varies with the surgical procedure performed. The most reported categories of endophthalmitis are following cataract surgery, intraocular lens implantation, and following intravitreal injections ***(Mutoh et al., 2012).*** A review of the literature indicates the incidence in these scenarios varies from 0.07% to 0.4% for cataract surgery and from 0.038% to 0.065% for intravitreal injections. Endophthalmitis following pars plana vitrectomy (PPV) is an uncommon cause of endophthalmitis ***(Aaberg et al., 2018).*** The reported rates of post-PPV endophthalmitis have been decreasing over the last decade ***(Park et al., 2014).*** In this review, the incidence of post-PPV endophthalmitis, causes, and management are reported.

Aim of the Work

The aim of this work is to do a meta-analysis of studies to know the incidence, causes, and management of post-vitrectomy endophthalmitis.

Chapter 1

PARS PLANA VITRECTOMY

Overview

Pars plana vitrectomy (PPV) is a commonly employed technique in vitreoretinal surgery that enables access to the posterior segment for treating conditions such as retinal detachments, vitreous hemorrhage, endophthalmitis, and macular holes in a controlled, closed system. The procedure derives its name from the fact that vitreous is removed (i.e. vitreous + ectomy = removal of vitreous) and the instruments are introduced into the eye through the pars plana ***(Kunimoto et al., 2007)***.

Indications

Indications for pars plana vitrectomy include removal of vitreous opacities, relieving vitreoretinal traction, restoring the normal anatomical relationship of the retina and retinal pigment epithelium (RPE), and accessing the subretinal space ***(Scott et al., 2008).***

Specific conditions include:

- Macular hole
- Epiretinal membrane
- Vitreomacular traction

- Vitreous haemorrhage
- Tractional retinal detachment
- Rhegmatogenous retinal detachment
- Refractory macular edema
- Vitreous biopsy
- Endophthalmitis
- Dislocated intraocular lens
- Retained lens material
- Intraocular foreign bodies

Basic Setup

The basic components of a vitrectomy setup include the following elements ***(O'Malley and Heintz, 2000)***:

- Vitrectomy machine (e.g., Alcon Constellation, DORC EVA, Bausch + Lomb Stellaris PC).
- A surgical microscope and a wide-angle viewing system (e.g., Zeiss RESIGHT, Oculus BIOM, AVI).
- Infusion cannula: to maintain intraocular pressure set by the vitrectomy machine.
- Endoillumination light source: for visualization of the posterior segment including vitreous and retina.

- Vitrectomy cutter (or vitrector): for vitreous removal, aspiration, and peeling and cutting membranes among other functions.

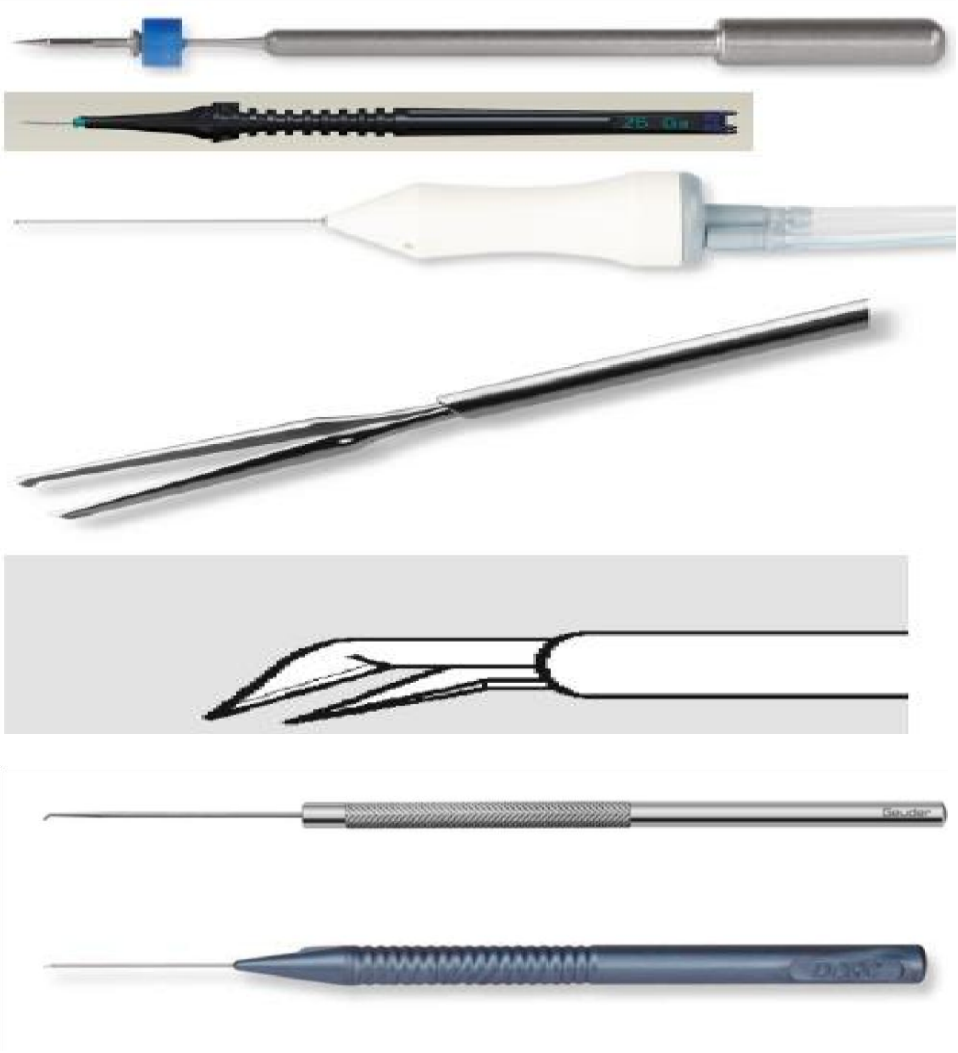

Figure (1): From up: DORC trocar and valved cannula, Alcon trocar, cutter, Eckardt forceps, vertical scissors, membrane pic and Tano membrane scrapper respectively ***(Yanyali et al., 2005).***

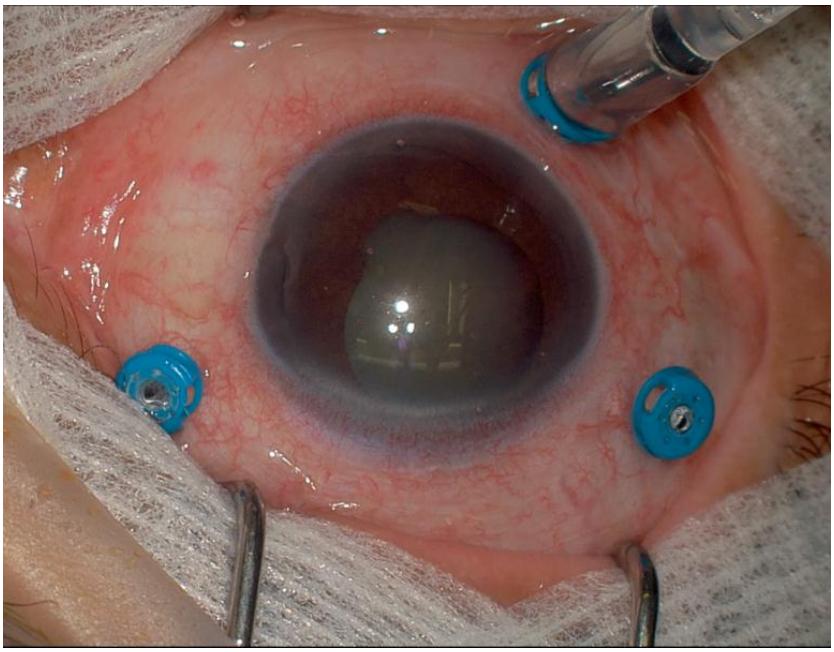

Figure (2): Standard three-port vitrectomy setup with one line dedicated to the infusion cannula ***(Recchia et al., 2010).***

Gauges

The gauge refers to the size of the instruments with higher numbers corresponding to smaller instruments (20-gauge = 0.9mm diameter, 23-gauge = 0.6mm diameter, 25-gauge = 0.5mm diameter, 27-gauge = 0.4mm diameter). When vitrectomy was first introduced, 20-gauge instrumentation was the most commonly used ***(O'Malley and Heintz, 2000)***. Sclerotomies created with 20-gauge instruments would need to be sutured. While seldomly used nowadays, there are still indications for which 20-gauge is necessary including removal of retained lens material using the fragmatome and removal of intraocular foreign bodies (IOFB) using IOFB forceps. In