Ain Shams University
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Recent Trends In Laser And Surgical Treatment Of Glaucoma

Essay

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"قالوا سبحانك لا علم لنا الا ما علمتنا انك انت

العليم الحكيم"

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List of Abbreviations:

AC: Anterior Chamber

ACG: Angle Closure Glaucoma

ALT: Argon Laser Trabeculoplasty

CAI: Carbonic Anhydrase Inhibitor

ECP: Endoscopic Cyclophotocoagulation

ELS: Excimer laser sclerostomy

5Fu: 5-Florouracil

GAGS: Glycosaminoglycans

HSV: Herpes Simplex Virus

IOP: Intra Ocular Pressure

LT: Laser Trabeculoplasty

LTD: Laser Trabeculodissection

MLT: Micro Pulse Laser Trabeculoplasty

MMC: Mitomycin-C

MPGS: Minimal Penetrating Glaucoma Surgery

NAG: Narrow Angle Glaucoma

NPGS: Non-Penetrating Glaucoma Surgery

NSAIDs: Non-Steroidal Anti-Inflamatory Drugs

OAG: Open Angle Glaucoma

PAS: Preoheral Anterior Synechial

PKP: Post Penetrating Keratoplasty

POAG: Primary Open Angle Glaucoma

PXF: Psudoexfoliation Glaucoma

SLT: Selective Laser Trabeculoplasty

TCO: Trans Conjunctival Oozing

TIGR: Trabecular Meshwork Inducible Glaucocorticoid

TM: Trabecular Meshwork

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Chapter 1

Introduction

Introduction

Glaucoma is the second leading cause of blindness in the world. ***(Quigley, 2005)***

Glaucoma is a multifactorial progressive disease characterized by structural damage to the optic nerve and slow progressive loss of retinal ganglion cells and their axons. ***(Varma et al., 2008)***

Treatment to decrease intraocular pressure forms the main stay therapy for the condition and may be achieved by medication , laser , surgery. ***(Chidlow et al., 2007)***

The introduction of selective laser trabeculoplasty (SLT) has renewed interest in laser trabeculoplasty for the reduction of intraocular pressure. SLT demonstrates equivalent efficacy and comparable safety to argon laser trabeculoplasty and is also equally as effective as medical therapy. SLT delivers less energy to the trabecular meshwork and generates less damage to angle tissues, It seems to be safe and effective means of intraocular pressure reduction and can reasonably applied as primary or adjunctive therapy. ***(Realini, 2008)***

The use of drainage systems in glaucoma treatment has progressively increased. They aimed to improve aqueous humor drainage through the trabecular meshwork. New drainage concepts either with biomaterial implants, inert or non absorbent, or with approaches to bypass trabecular resistance and facilitate aqueous humor outflow directly in schlemm's canal. ***(Robe, 2009)***

Surgical intervention may be required when medical and or laser therapy fail to control intraocular pressure. Traditional glaucoma surgery such as trabeculectomy has been performed for decades. Unfortunately many complications such as hypotony and slow visual recovery are known to occur. So, new devices are being developed. One such device is the express mini glaucoma shunt which has undergone changes in design and methods of insertion making it more appealing for use in patients requiring intraocular pressure lowering surgery. ***(Hendrick et al., 2008)***

In open angle glaucoma the express mini glaucoma shunt implanted under a superficial scleral flap produces significantly higher success rates compared with trabeculectomy. So the express mini glaucoma shunt is a safe and effective device for treating open angle glaucoma. ***(De Jong, 2009)***

Implantation of biodegradable, porous collagen matrix in the subconjunctival space offers the potential for a new means of avoiding early scar formation and maintaining long term intraocular pressure control by creating a loosely structured filtering bleb. ***(chen et al., 2007)***

Aim of the study:

The aim of this essay is to review the recent trends in laser as well as surgical Treatment of Glaucoma.

Chapter 2

Anatomy

Anatomy of the angle of the anterior chamber

Gross anatomy:

The ciliary body attaches to the scleral spur and creates a potential space, the supraciliary space, between itself and the sclera. On Cross-section, the ciliary body has the shape of a right triangle, and the ciliary processes (the actual site of aqueous production) occupy the innermost and most anterior portion of this structure, extending back for approximately 2mm in the region called the pars plicata (or corona ciliaris). The posterior 4mm of the ciliary body, the pars plana (or orbiculus ciliaris), has a flatter inner surface and joins the choroid at the ora serrata. ***(Shields, 1987)***

The iris inserts into the anterior side of the ciliary body, leaving a variable width of the latter structure visible between the root of the iris and the scleral spur. The lens is suspended from the ciliary body by zonules and separates the vitreous, posteriorly, from the aqueous, anteriorly. The iris separates the aqueous compartment into a posterior and anterior chamber, and the angle formed by the iris and the cornea is called the anterior chamber angle. ***(Shields, 1987)***

Thus, aqueous humor is produced by the ciliary processes and first enters the posterior chamber. Most of the aqueous passes forward, through the pupil, to the anterior chamber, where it leaves the eye by way of the anterior chamber angle. ***(Shields, 1987)***