بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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MONA MAGHRABY

Comparison between Posterior Capsular Opacification Following Implantation of Hydrophilic & Hydrophobic Acrylic IOLs

Thesis

For Partial Fulfillment of Master Degree
in **Ophthalmology**

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بسم الله الرحمن الرحيم

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

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Karim Raafat Aly Elsayed Rehan

Conflicts of Interest

I declare that there is no conflict of interest or financial interest.

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List of Abbreviations

Abb.	Full term
LECs	Lens epithelial cells
AZ	Anterior zonular fibers
CM	Ciliary muscle
EMT	Epithelial-to-mesenchymal transition
FGF-2	Fibroblast growth factor 2
HS	Highly significant
LECs	Lens epithelial cells
NS	Non significant
PCO	Posterior Capsular Opacification
PZ	Zonular fibers
S	Significant
TGF	Transforming growth factor

INTRODUCTION

Posterior capsule opacification (PCO), often referred to as "secondary cataract", is the commonest complication of cataract surgery occurring in up to 50% of candidates within 2–3 years postoperatively. Moreover, it has been reported that the PCO incidence reaches up to 100% in younger children when the posterior capsule remains intact. [1, 2]

PCO is known to be a multifactorial pathology and is likely a complicated interaction of several variables, including the surgical technique, the IOL materials, and the variable IOL designs. [3]

The central PCO, which significantly lowers the patients' visual acuity for obscuring the visual axis, can be treated with either surgical intervention (such as posterior capsule scraping) or with a non-surgical Nd: YAG (neodymium-doped yttrium aluminum garnet) laser capsulotomy. The latter method has been gaining a wide acceptance for long time interval, but may be associated with several complications, and therefore prevention remains the best measure for controlling this pathology. [4]

Aim of the Work

To compare the incidence of posterior capsular opacification in patients who underwent hydrophilic IOLs versus hydrophobic IOLs implantation.

Chapter 1

PATHOGENESIS OF POSTERIOR CAPSULAR OPACIFICATION (PCO)

The lens epithelial cells (LECs) left behind in the capsular bag after any type of extracapsular cataract surgery are mainly responsible for PCO development.[5] Proliferation, migration, epithelial-to-mesenchymal transition (EMT), collagen deposition, and lens fiber regeneration of LECs are the main causes of opacification.

It appears that cataract surgery induces a wound healing response in the lens, and leftover LECs proliferate and migrate across the posterior capsule and undergo lens fiber regeneration and EMT. [6]

Clinically, there are 2 morphological types of PCO, the fibrosis type and the pearl type. [7] Fibrosis-type PCO is caused by the proliferation and migration of LECs, which undergo EMT, resulting in fibrous metaplasia and leading to significant visual loss by producing folds and wrinkles in the posterior capsule. While pearl-type PCO is caused by the LECs located at the equatorial lens region (lens bow) causing regeneration of crystallin-expressing lenticular fibers and forming Elschnig pearls and Soemmering ring, **(Fig. 1)** responsible for most cases of PCO-related visual loss. [8] **(Fig. 2)**