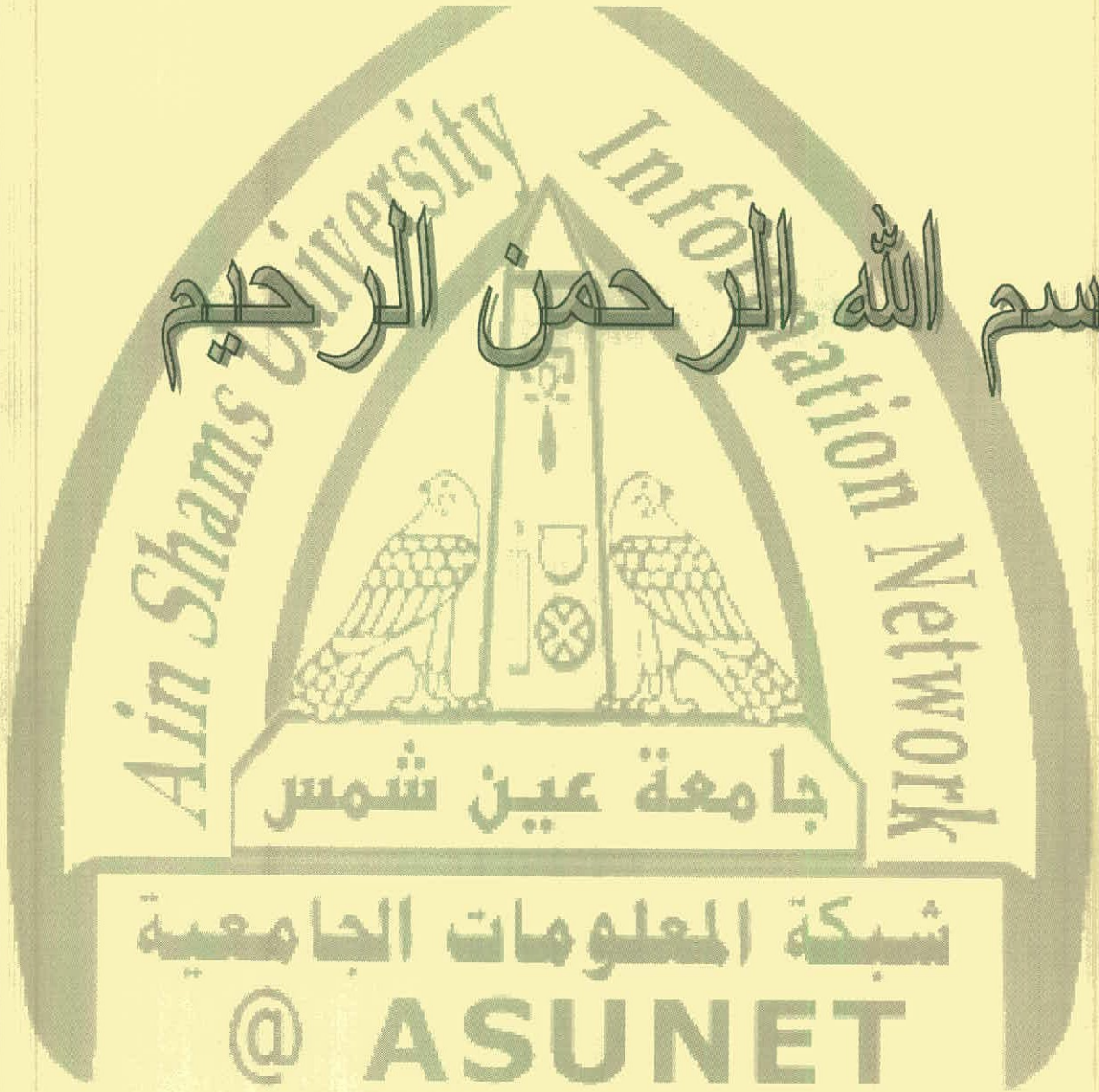
شبكة المعلومات الجامعية



بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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٢٠٠٩

Comparison between Extracapsular Cataract Extraction and Phacoemulsification in Mature Cataract; Effect on the Corneal Endothelium.

THESIS

Submitted to the Faculty of Medicine - University of Alexandria
in partial fulfillment of the requirement of the degree of

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Dedicated to my family

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Abbreviations

- ECCE : Extracapsular cataract extraction.
- ECD: Endothelial cell density.
- ECL: Endothelial cell loss.
- AECS: Average endothelial cell size.
- COV: Coefficient of variation of cell size.
- CCT: Central corneal thickness
- EM: Electron microscope.
- TEM: Transmission electron microscope.
- mm: Millimeters.
- nm: Nanometers.
- μ: Micrometers = Microns
- AC: Anterior chamber.
- PC: Posterior chamber.
- CCC: Continuous curvilinear capsulorhexis.
- GV: Gentian violet.
- ICG: Indocyanine green.
- MB: Methylene blue.
- PMMA: Poly methyle metacrylate.
- IOL: Intra ocular lens.
- OD: Optic diameter.
- HM: Hand motion.
- LP: Light projection.
- UCVA: Uncorrected visual acuity.
- BCVA: Best corrected visual acuity.

Contents

INTRODUCTION

Introduction

Cataract extraction surgery has become one of the safest, most successful, and most frequently performed surgeries [1]. The techniques and results of cataract surgery have changed dramatically during the past three decades [2].

The intracapsular method remained unchallenged until it was replaced by the extracapsular method as the intact posterior capsule allowed for safer, more controlled surgery and less likelihood of vitreous loss, and would often provide support for an IOL [3]. Also, an intact capsule eliminates the short and long-term complications associated with vitreous adherence to the iris, cornea, and incision which was commonly met with during the intracapsular cataract extraction. It also provides a barrier restricting the exchange of some molecules between the aqueous and vitreous, and reduces the incidence of retinal detachment and corneal edema [4].

The extracapsular method of cataract extraction was popular about 60 years ago Since then many changes have occurred either in the technique or in the instruments used for example using a cystitome to perform anterior capsulotomy through the "Can-opener" technique which was developed by James Little [5] .With different shapes of the anterior capsulotomies were developed such as circular can opener, D- shaped, U- shaped, Christmas tree, vertical oval, horizontal oval and vertical ellipse [6].

Also the use of a coaxial, double lumen cannula during irrigation aspiration one lumen irrigates from a solution bottle; with the bottle height regulates the fluid flow. The second lumen aspirates lens material out of the anterior chamber; aspiration is through a syringe connected to the cannula[7]. But with ECCE, it was necessary to wait until the cataract was nearly mature because non-opaque parts of the lens were difficult to remove [5]. The inability to adequately visualize and remove retained cortical material resulted in severe postoperative inflammation and dense posterior membranous opacification [4].

The most exciting innovation in cataract surgery in the 20th century is the technique of phacoemulsification, introduced by Charles Kelman in 1967. Phacoemulsification permits the removal of cataract through a 3 mm incision thus eliminating the many complications related to large incision size [3, 8-11].

Phacoemulsification is a sophisticated form of extracapsular cataract extraction .It does this by fragmenting the nucleus using vibrational energy, which allows aspiration of lens matter leaving behind an intact posterior capsule. Kelman introduced the procedure in 1967 and performed posterior chamber phacoemulsification. He then changed to anterior chamber phacoemulsification, because he considered it less likely to cause posterior capsule rupture. However, there remained two significant disadvantages:

- . First, this method caused more endothelial cell loss than anterior chamber phacoemulsification and,