Mona maghraby

بسم اللّه الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني

Mona maghraby

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

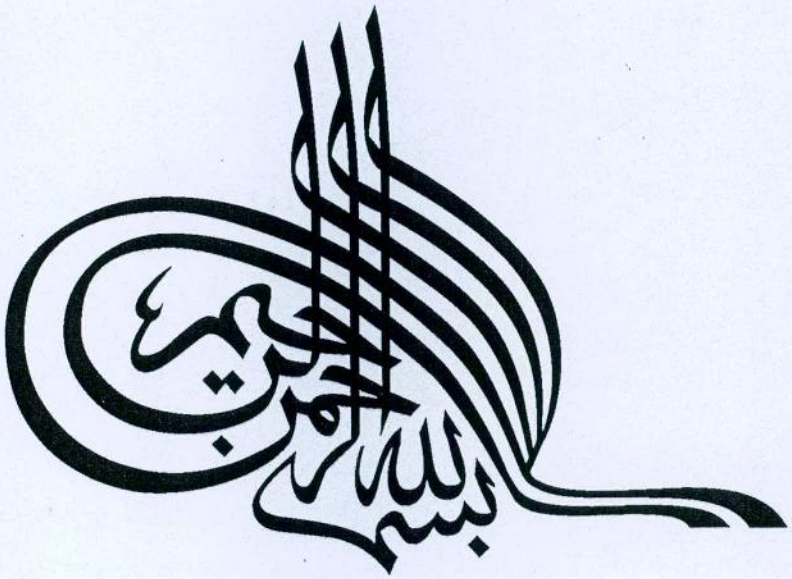
قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

Mona maghraby

بعض الوثائق الأصلية تالفة
وبالرسالة صفحات لم ترد بالأصل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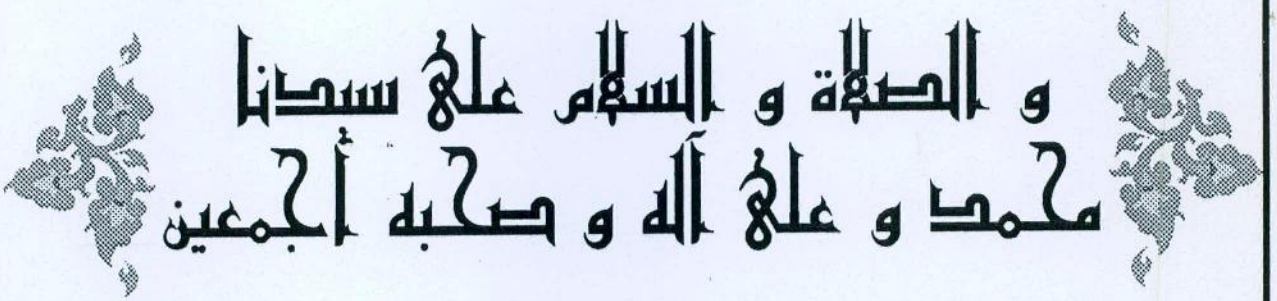
و الصلاة و السلام على سيدنا
محمد و على آله و صحبه أجمعين

PACHYMETRIC CHANGES FOLLOWING LASIK FOR MYOPIA

Thesis

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TO

MY FAMILY

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CONTENTS

INTRODUCTION

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Evolution of Lamellar Refractive Surgical Procedures:

Keratomileusis was introduced almost half a century ago by Jose' Barraquer. Barraquer's technique consisted of resecting an anterior lamellar corneal lenticule (about 300u thick) with a microkeratome (primary keratectomy). This lenticule was then frozen and reshaped on a cryolathe to produce the desired refractive change (refractive keratectomy). The reshaped lenticule was then thawed and sutured back onto the cornea. This procedure had a number of difficulties which prevented its widespread application. First, the keratectomy was performed manually, requiring a specially skilled and trained surgeon and resulting in variable refractive outcome. Second, freezing and reshaping of corneal tissue required an expensive and complicated instrument and resulted in persistent haziness of the cornea due to the biological damage of the freezing.[1]

Krumeich developed planar non-freeze keratomileusis, in which the refractive keratectomy was performed without freezing the tissues. Corneas treated this way cleared more quickly but the technique was difficult to use and refractive predictability was poor with high incidence of irregular astigmatism.[2]

Myopic keratomileusis in situ was developed by Barraquer. The procedure consisted of two keratectomies, a primary anterior one as in Barraquer and Krumeich techniques to expose the corneal stroma followed by a second keratectomy on the exposed stromal bed (the refractive cut). The anterior lenticule was then replaced and sutured. Performing the two keratectomies manually with the microkeratome was the major disadvantage of this surgical procedure, because good centration of both the optical zone and the refractive incision was difficult.[3]

In the late 1980s, Luis Ruiz introduced the mechanically advanced (automated) microkeratome, known today as the Corneal Shaper. Keratomileusis in situ was renamed " Automated Lamellar Keratoplasty (ALK) ". The speed of passage of the microkeratome was important in standardizing the flap thickness, as faster rates produce thinner flaps regardless of the depth plate utilized. The automation allowed for reproducible smooth lamellar incisions. However, the procedure remained restricted by the fact that the refractive cut was not truly "refractive" but the resection of a plano disc from the stromal bed. Other limitations of ALK include a small optical zone with defective quality of night-time vision, two keratectomies requiring increased technical skill, procedure predictability in the range of +/- 2.00 D, and high instrumentation care requirements.[4,5]

The use of argon fluoride excimer laser (193nm) to correct refractive errors was first suggested by Trokel and Srinivasan in 1983. The word excimer was coined in 1960 as a contraction of excited dimer. Absorption of the extremely high energy of this laser by the corneal tissues leads to breakage of the intramolecular bonds (photoablation). Molecular fragments leave the ablated surface at supersonic velocities together with excess energy causing minimal thermal damage to the surrounding tissues. This mechanism explains the submicron precision in tissue resection and the sharply defined and smooth boundaries of ablated areas.[6] In photorefractive keratectomy (PRK) excimer laser is used to ablate Bowman's membrane and the superficial stroma to correct low and moderate myopia, between approximately 1.50 to 6.00 diopters. PRK can be used to treat higher levels of myopia using multizone ablation profiles, but excessive scarring and regression of effect may occur. Limitations of PRK include severe postoperative pain for 24-72 hours, relatively prolonged visual rehabilitation time, regression of effect and subepithelial haze.[7]

The use of the excimer laser to create the refractive cut in keratomileusis has developed along two lines.

The first was described originally by Burratto, in which a 300um thick disc of cornea was removed, inverted, and the excimer laser used to perform the refractive ablation on the back of the disc. Burratto called this photokeratomileusis (PKM), and considered it a logical extension of Krumeich's planar non-freeze keratomileusis[8,9].

The second line of growth was excimer laser keratomileusis in situ, initially developed by Pallikaris. The refractive cut in this procedure is performed in the stromal bed of a thin lamellar corneal cap, using the excimer laser.[10]

In 1988, Pallikaris and colleagues carried out their initial studies on rabbits and blind human eyes. Pallikaris began studies on sighted human eyes in 1991. He suggested the name laser in situ keratomileusis (LASIK) for this procedure. Pallikaris used a manually advanced microkeratome of his own design [11,12].

In 1993, Ruiz presented the hinged flap technique in the annual meeting of the American Academy of Ophthalmology. This was a major development of the LASIK technique as it significantly improved the safety of the procedure.[4]