THE CORRECTION OF MYOPIA BY LENS IMPLANTATION INTO PHAKIC EYES

ESSAY

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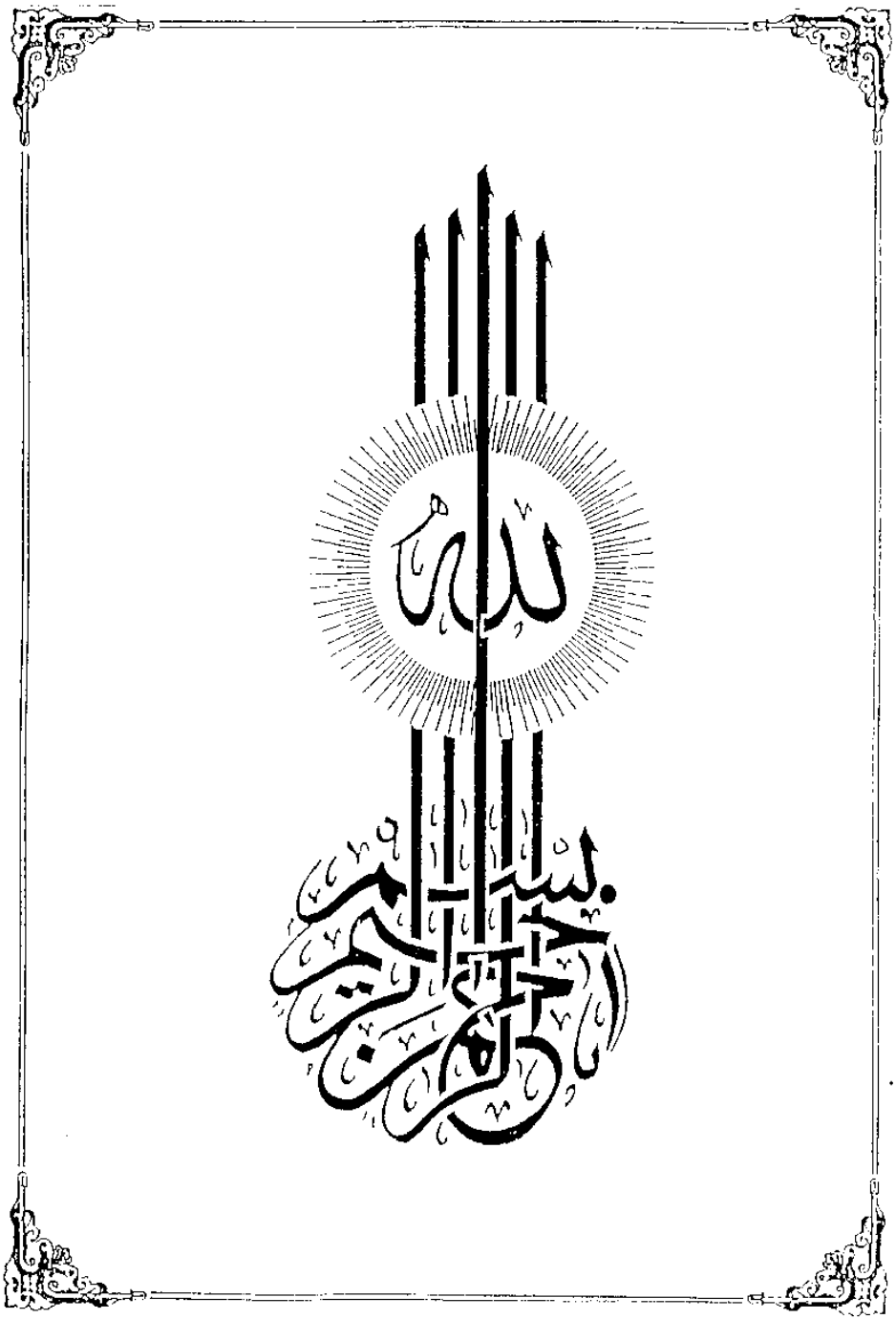

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LIST OF ABBREVIATIONS

AC = Anterior chamber
CL = Contact lens
EK = Epikeratophakia
END = Examination not done
Fig. = Figure.
IOL = Intraocular lens
IOP = Intraocular pressure.
K = Keratometer
KM = Keratomiluesis
LSU = Louisiana state university eye center
PMMA = Poly-methyl methacrylate
PRK = Photorefractive keratectomy
RK = Radial keratotomy
TM = Trade mark

INTRODUCTION

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The functional disturbances caused by high myopia are equivalent to those caused by aphakia *(Baikoff, 1992)*. It's estimated that approximately 10% of the population are myopic in a range between -2 and -10 diopters *(Linstrom, 1990)*. Although, patients of more than -10 diopters of myopia are fewer in number, yet their requirements for suitable correction are great.

For years, ophthalmologists have considered alternative modes of treatment for myopia. Certainly **spectacles** have been the primary modality of treatment of these patients over the years. However, as the degree of myopia increases, the abberations and field limitations of spectacles become more pronounced. **Contact lenses** have provided many myopes excellent visual results, but have certain limitations and are not tolerated well by some patients. With the inadequacy of the visual results provided by spectacles and the intolerance of some patients to contact lenses, surgical approaches to the correction of myopia have been thought *(Cook, 1991)*.

During the 1980s, considerable work have been carried out through surgical procedures on the cornea to get the desired flattening or curvature change required to correct myopia. Such

procedures include most notably **radial keratotomy (RK), keratomileusis (KM), Epikeratoplasty (EK), corneal inlays,** and more recently in the early 1990's **photorefractive keratectomy (PRK)** with excimer laser photoablation of the outer corneal surface. While all of these procedures have enjoyed a modicum of success, non have fully conquered the two primary challenges in myopic surgery-predictability and stability. Further, all of these corneal procedures alter the corneal tissue in a manner which is often symptomatic for the patients and may result in longer term impediments to visual acuity *(Cook, 1991).*

Although **phakic myopic intraocular lenses** were tried and abandoned in the 1950s, it is our contention that this modality should be reconsidered *(Praeger, 1988).* High myopia can be corrected by placing an introcular lens in the phakic eye. This defenition includes all lenses located between the cornea and the anterior surface of the crystalline lens, which is left undisturbed inside the eye *(Baikoff, 1992).*

AIM OF THE STUDY

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The aim of this study is to review the intraocular lenses implantation in myopic phakic patients as a method of correrction of high myopia.

We shall discuss the different types of lenses used, methods of caluclation of their power, clinical result, techniques of implantation, as well as the possible complications of such surgery. Also we shall compare this technique to other modalities of correcting myopia, including conventional spectacles, contact lenses, different types of refractive corneal surgery and clear lens extraction for axial myopia.

HISTORICAL HINT

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The story of implantation of intraocular lenses into phakic eyes to treat myopia has a disastrous history. Strampelli implanted exmaples of his own design in 1953 with indifferent results. The most notorious example, however, is that of Joaquin Barraquer's experience in 1959. The immediate results were encouraging, but after a few years ocular hypertension occured along with many cases of corneal decompensation. A few rare patients still tolerate their implant *(Barraquer, 1959)*. This early failure during the 1950s was certainly due to faulty manufacture, the use of very thick haptics (approximately 1mm), and the lack of an available viscoelastic substance for use during surgery. In addition, these surgeries were performed with loupe magnification only *(Bores, et al, 1993)*.

Later, Choyce (1964) began developing anterior chamber implants to correct aphakia and myopia. He fared better than Barraquer, and it was due to his perseverance that his successors, Kelman (1984) in particular, were able to develop reliable anterior chamber implants to correct aphakia. In the late 1970s, Worst introduced an implant to correct aphakia that was attached to the iris with two small clips following intracapsular cataract extraction the lobster Claw Lens. This model was the precursor of a distinct type of myopic implant