

THE CORRECTION OF MYOPIA BY LENS IMPLANTATION INTO PHAKIC EYES

ESSAY

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the master degree in Ophthalmology

By

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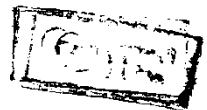
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CONTENTS

		Page
	Acknowledgement	i
	List of figures	ii
	List of tables	iv
	List of abbreviations	v
1	Introduction	1
2	Aim of the study	3
3	Historical hint	4
4	Types of phakic intraocular lenses	6
5	Methods of calculation of the lens power	20
6	Animal experimentation	24
7	Techniques of surgery of phakic IOL implantation	29
8	Clinical results	41
9	Postoperative omplications of phakic IOL implantation	49
10	Evaluation of other methods for treatment	71
	1. Spectacles	71
	2. Contact lenses	72
	3. Keratomileusis	72
	4. Epikeratophakia	75
	5. Clear lens extraction	77
	6. Refractive keratotomy (RK)	79
	7. Photo refractive keratectomy (PRK)	82
	8. Corneal inlays	85
	9. Intra corneal ring	87
11	Comments	89
12	Summary	93
13	References	96
14	Arabic summary	—

Fig.No.	LIST OF FIGURES	Page
Fig.1	Baikoff Domilens Z B	7
Fig.2	Domilens ZB /Domilens ZB-5M	9
Fig.3	Kelman Multiflex/Domilens ZB-5M	10
Fig.4	Worst Myopia Claw Lens	12
Fig.5	Worst Myopia Claw Lens (-5 and -25 D.)	12
Fig.6	Kelman Multiflex/Worst Myopia Claw Lens	12
Fig.7	Worst Myopia Claw Lens (Section at -15 D).	13
Fig.8	Worst Myopia Claw Lens/Domilens ZB	14
Fig.9	Worst Myopia Claw Lens/Domilens ZB-5M	15
Fig.10	a) Fyodorov, silicon, intraocular lens b) Post surgical eye	17
Fig.11	a) Cross-section showing the position of the haptic of Fyodorov lens. b) Position of Fyodorov lens on the crystalline surface.	18
Fig.12	a) The Fyodorov collagen implant for myopia b) Post implant eye.	19
Fig.13	Insertion of the iris claw lens.	35
Fig.14	Wrost Fechner biconcave lens: a)lens in situ, b)after dilatation	36
Fig.15	Baikoff implant: a) In normal position, b) after dilatation	40
Fig.16	Postoperative refraction results by Colin et al.	42
Fig.17	Postoperative refraction results by Fechner	43
Fig.18	Uncorrected visual acuity result by Baikoff	46

(List of figures: Continuu)

Fig.No.	LIST OF FIGURES	Page
Fig.19	Spectacle corrected visual acuity results by Baikoff.	47
Fig.20	a) Specular photomicrograph of central cornea b) Paracentral specular photomicrograph	51
Fig.21	Contact possible between the cornea and implant	56
Fig.22	Gonioscopic aspect, foetplates of implant in correct possition	56
Fig.23	Gonioscopic view of first-generation implant	57
Fig.24	Gonioscopic view of second generation implant	57
Fig.25	a) pupillary dceformation observed 4 months postoperative b) pupillary dceformation more worse	65
Fig.26	Rear illumination after mydriasis crystalline lens in normal state.	68

Table No.	LIST OF TABLES	Page
Tab.1	IOL equivalent power needed in the myopic phakic eye	23
Tab.2	Fifty-Two eyes corrected to near-emmetropia	43
Tab.3	Uncorrected distance visual acuity with a minus power A.C. IOL	46
Tab.4	Spectacle corrected distance visual acuity with a minus power A.C IOL	47
Tab.5	Evaluation of the corneal endothelium in 15 eyes with minus power anterior chamber lenses	52
Tab.6	Complete follow-up percentage of average endothelial cellular loss	55
Tab.7	Comparison of different methods for treatment of myopia	88

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 aberrations 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, none 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 intraocular lens in the phakic eye. This definition 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 correction of high myopia.

We shall discuss the different types of lenses used, methods of calculation 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 examples 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 occurred 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