

Contents

	Page
I - INTRODUCTION	1
II - AIM OF THE WORK	3
III - REVIEW OF LITERATURE	
• Anatomy:	4
• Biomechanics:	11
• Ocular Response Analyzer:	23
• Corneal Biomechanics:	29
IV-SUMMARY	48
V- REFERENCES	51
VI- ARABIC SUMMARY	

List of Figures

Figure	Subject	Page
Fig.(1)	A Finite Element.	12
Fig. (2)	Unit force vectors.	13
Fig. (3)	Stress variable convention for an infinitesimal cube.	14
Fig. (4)	Extensional strain.	16
Fig. (5)	Shear strain.	16
Fig. (6)	Stress-strain curve for linear elastic material (a straight line).	18
Fig. (7)	Stress-strain curve of steel (linear elastic zone, nonlinear plastic zone, and fracture).	18
Fig. (8)	Non-linear elastic material curve.	19
Fig. (9)	Non-linear visco-elastic material curve.	19
Fig. (10)	Poisson's Ratio.	20
Fig. (11)	Diaton Tonometer.	24
Fig. (12)	Rebound Tonometry.	26
Fig. (13)	PASCAL Tonometer.	26
Fig. (14)	Corneal Hysteresis.	28
Fig. (15)	Ocular Response Analyzer.	30
Fig. (16)	Corneal Hysteresis is the difference between (P1) & (P2).	30
Fig. (17)	Corneal Hysteresis; Typical signal from a normal eye.	30
Fig. (18)	Normal ORA. (A)ORA graphs; (B)CH, CRF, IOPcc& IOPg.	31
Fig. (19)	Irregular cornea (not keratoconic)-normal CH and CRF.	33
Fig. (20)	Corneal Hysteresis for different pathological conditions.	34

Fig. (21)	Corneal Hysteresis (pre-LASIK & post-LASIK).	37
Fig. (22)	Ectasia susceptibility	41
Fig. (23)	LASIK case; corneal topography & Corneal Hysteresis.	41
Fig. (24)	Keratoconic Eye; corneal topography & Corneal hysteresis.	44
Fig. (25)	Keratoconus & Keratoconus suspect.	44
Fig. (26)	CH of an NTG subject.	46

List of abbreviations

ACD	Anterior chamber depth
CCT	Central corneal thickness.
CH	Corneal Hysteresis.
CPACG	Chronic Primary Angle-Closure Glaucoma.
CRF	Corneal resistance factor.
DCT	Dynamic Contour Tonometry.
DXEK	Descemetorhexis with endokeratoplasty.
GAT	Goldmann applanation tonometry.
IOP	Intra-ocular Pressure.
IOPcc	Corneal-compensated IOP.
IOPg	Goldmann-correlated IOP.
LASIK	Laser in situ keratmeilusis.
OHT	Ocular Hyper-tension
ORA	Ocular Response Analyzer.