
TABLE OF CONTENTS

AKNOWLEDGEMENTS.....	2
SUPERVISORS.....	3
INTRODUCTION.....	1
AIM OF THE WORK.....	3
ANATOMY.....	4
NORMAL STRUCTURE OF THE CORNEAL ENDOTHELIUM.....	4
ENDOTHELIAL CELL POPULATION CHANGES OF HUMAN CORNEA DURING LIFE.....	6
PHYSIOLOGY.....	8
PHYSIOLOGY OF THE CORNEAL ENDOTHELIUM.....	8
MAINTENANCE OF CORNEAL TRANSPARENCY.....	8
The barrier function of the endothelium.....	9
Pump function of the endothelium.....	9
Active transport in the endothelium.....	9
Energy requirement and enzyme inhibitors.....	10
Ion transport across the endothelium.....	10
PACHYMETRY.....	13
MEASUREMENT OF THE CORNEAL THICKNESS.....	13
Description of the instrument and the modification.....	14
The theory of the measurement.....	15
Thickness of the Human Cornea.....	16
SPECULAR MICROSCOPY.....	18
HISTORICAL BACKGROUND.....	18
OPTICAL PRINCIPLES.....	20
The posterior corneal surface.....	22
WIDE FIELD SPECULAR MICROSCOPY.....	24
Advantages of the wide field microscope.....	27
What we actually see in specular microscopy.....	28
VISCOUS MATERIALS.....	30
Viscosity.....	30
Visco-elasticity.....	31
THE RHEOLOGICAL REQUIREMENTS FOR AN INTRAOCULAR SOLUTION.....	32
1. Na Hyaluronate (HEALON).....	33
Protection Of Corneal Endothelium.....	34
Effect on Intraocular Pressure.....	34
2. Methylcellulose (HPMC).....	36
Chemistry of Methylcellulose.....	36
Preparation for intraocular use.....	36
Preparation of 100 ml of a 2% solution is as follows.....	37

Methylcellulose has many advantages	37
HEALING OF CORNEAL ENDOTHELIUM.....	40
ANALYSIS OF CORNEAL ENDOTHELIAL PHOTOMICROGRAPHS.....	45
QUALITATIVE EVALUATION OF CORNEAL ENDOTHELIAL PHOTOS.....	46
General Topography	46
1) Cell conformation	46
2) Cell Boundaries and intersections	48
3) Posterior Corneal Surface	48
4) Miscellaneous structures	48
PLEOMORPHISM	48
QUANTITATIVE EVALUATION OF CORNEAL ENDOTHELIUM	55
MATERIALS AND METHODS.....	60
Measurement of corneal thickness (Pachymetry)	60
Specular microscopy	61
The surgery	65
RESULTS.....	68
DISCUSSION.....	101
SUMMARY.....	112
REFERENCES.....	114
