PRIMARY RHEGMATOGENOUS RETINAL DETACHMENT AT KASR AL AINI HOSPITAL: PREDISPOSING FACTORS AND CLINICAL FEATURES.

Protocol for thesis submitted for partial fulfillment of M.Sc. degree in Ophthalmology

By

Mohamed Gaber Ahmed

M.B. B.Ch

Faculty of Medicine - Cairo University

Under Supervision of

Prof. Dr. Hassan Aly Mortada

Professor of Ophthalmology

Faculty of Medicine - Cairo University

Prof. Dr. Tamer Ahmed Macky

Professor of Ophthalmology

Faculty of Medicine - Cairo University

Dr.Mohamed Amr Salah Eddin

Lecturer of Ophthalmology

Faculty of Medicine - Cairo University

Faculty of medicine

Cairo University

2014

Table of Contents

Acknowledgement

A research project like this is never the work of anyone alone. The contributions of many different people, in their different ways, have made this possible.

First and foremost I would like to express my deep gratitude, appreciation and sincere thanks to ***Prof. Dr. HassanAlyMortada***, Professor of ophthalmology, Faculty of Medicine, Cairo University, for his supervision, support, motivation, valuable remarks, patience, enthusiasm, until this work was fulfilled.

I would like also to express my special deep gratitude, appreciation and sincere thanks to ***Prof. Dr. Tamer AhmedMacky***, Professor of ophthalmology, Cairo University, for his continuous support, meticulous supervision, valuable remarks, and assistance until this work was fulfilled. Without his helpful suggestions and corrections, I would never have finished this research.

I would like to express my deep gratitude, appreciation and sincere thanks to ***Dr. Mohamed AmrSalah Eddin***, Lecturer of ophthalmology, Faculty of Medicine, Cairo University, for his valuable advice, constructive criticism and extensive discussions about my work.

And special thanks to all members of my family. Your understanding, patience, great support to me throughout my life.

Last but not least, to all patients, by whom this study was done. Without them, this work wouldn't have been possible.

Mohamed Gaber Ahmed

Abstract

Purpose:

The purpose of this study was to investigate the patients' demographic characteristics, predisposing factors, clinical features, surgical interventions and intra-operative findings for patients with rhegmatogenous retinal detachment(RRD) who were hospitalized and operated at Kasr Al Aini hospital, over a time interval of 6 months.

Patients & Methods:

This is a prospective observational analytical epidemiological study that includedpatients with 1ry RRD who were admitted for surgical intervention at Kasr Al-Aini Teaching Hospital, CairoUniversity in a time period of 6 months starting from March 2013 to September 2013. The patients were selected from the outpatient Ophthalmology Clinic of Kasr Al-Aini Hospital. **The primary outcome measures** were the predisposing factors for the RRD (blunt trauma, myopia, previous cataract surgery, family history of RRD), and the clinical features of RRD (quadrants affected, macula on/off, number, types, location of breaks, presence and distribution of lattice, signs of posterior vitreous detachment(PVD) and presence and grading of proliferative vitreoretinopathy(PVR). **The secondary outcome measures** were the patients' demographic data.

Results:

Sixty five (65 eyes) patients were included of which 19 eyes (29.2%) had total RRD.The patients' age ranged from 3 to 80 years of age with a mean value of

45.65± 18.56 years.The study included 40 males (61.5%) and 25 females (38.5%) with a female to male ratio of 1:1.6. Twenty-two eyes (33.8%) had high myopia (> -6 D), 15 eyes (23.1%) were aphakic/pseudophakic, and 13 eyes (20%) with a history of blunt trauma.The macula was attached only in 3 cases (4.6%).The size of the breaks ranged from 0.25 to 4 clock hours with a mean of 1.15±0.96,16 patients showed horse shoe tears, 16 patients showed holes, 3 patients showed giant tears, 4 patients showeddialysis , 2 patients showed slit shaped tears.In 24 (36.9%) patients in our study there was no breaks detected pre-operatively.Forty-four eyes (67.7%) had PVR-A, 11 eyes (16.9%) had PVR-B, and 10 eyes (15.4%) had PVR-C.Pars planavitrectomy (PPV) was done for 57 eyes (87.7%), of which 29 eyes had undergone phaco-vitrectomy (50.9%). Scleral buckling was done for 6 eyes (9.2%), and pneumatic retinopexy was done for 2 eyes (3.1%).

Conclusion:

This study showed that high myopia,peripheral retinal degenerations,pseudophakia/ aphakia, blunt ocular trauma and history of RD in the other eye, in a descending order were the main risk factors predisposing to RRD.

Keywords: Kasr Al Ainy Hospital; Rhegmatogenous retinal detachment; Predisposing pathology

List of Abbreviations

Abbreviation	*Full Name*
BCVA	Best Corrected Visual Acuity
BRB	Blood-Retinal-Barrier
CB	Ciliary Body
CE	Cataract Extraction
D	Diopter
DD	Disc Diameter
DM	Diabetes Mellitus
ECCE	Extra Capsular Cataract Extraction
ERM	Epiretinal membrane
HA	Hyaluronic Acid
H/O	History
HTN	Hypertension
ICCE	Intra Capsular Cataract Extraction
ILM	Internal Limiting Membrane
IOL	Intra ocular Lens
IOP	Intra ocular pressure
IPM	Inter-photoreceptor matrix
NSR	Neuro sensory retina
OCT	Optic Coherence Tomography
PC	Posterior Capsule

PPV	Pars Plana Vitrectomy
PVD	Posterior Vitreous Detachment
PVR	Proliferative Vitreo Retinopathy
RD	Retinal Detachment
RPE	Retinal Pigment Epithelium
RRD	Rhegmatogenous Retinal Detachment
SD	Standard Deviation
SE	Spherical Equivalent
SO	Silicone Oil
SRF	Subretinal Fluid
UK	United Kingdom
VA	Visual Acuity
VH	Vitreous Haemorrhage

List of Tables

List of Figures

Introduction

The diagnosis of rhegmatogenous retinal detachment (RRD) is based on a case definition of "a full thickness break in the neurosensory retina with a surrounding area of sub-retinal fluid extending greater than 2 disc diameters"**(Polkinghorne& Craig, 2004)**. Separation between the neurosensory retina and the underlying choroidal circulation results in ischemia and rapid progressive photoreceptor degeneration**(Yang et al, 2004)**. Most cases of RRD present when the macula is involved and require intervention to restore vision or prevent further visual loss **(D'Amico et al, 2008)**.

Predisposing associations and factors with RRD, such as high myopia, previous cataract surgery, direct ocular trauma, and peripheral retinal degenerations, are well established**(The Eye Disease Case-Control Study Group, 1993)**. However, the incidence of these features and their relative contribution to RRD occurrence in populations are not well documented. Similarly, the occurrence of hereditary vitreoretinal degenerations in RRD populations is uncertain. Despite treatment advances, functional results remain poor, with only 42% achieving 6/12 vision if macula is attached and only 28% if the macula is involved**(Pastor et al, 2008)**.

Although several risk factors for RRD have been identified, myopia is recognized as the most important factor in several reports**(The Eye Disease Case-Control Study Group, 1993)**. RRD is also frequent after surgery for cataracts.

The estimated long-term incidence of pseudophakic RRD is in the range of 5 to16 per 1000 cataract operations**(Ramos et al, 2002)**, but is much higher in patients who are highly myopic, with a prevalence of up to 7% being reported in one study**(Hyams et al, 1975)**

Aim of work

In this study we evaluated & observed the patients' demographic characteristics, predisposing factors, clinical features, surgical interventions and intraoperativefindings for patients with RRD who were hospitalized and operated at Kasr Al Aini hospital, over a time interval of 6 months.

Pathogenesis & Mechanism of Rhegmatogenous Retinal Detachment

The diagnosis of rhegmatogenous retinal detachment (RRD) is based on a case definition of "a full thickness break in the neurosensory retina with a surrounding area of sub-retinal fluid extending greater than 2 disc diameters"**(Polkinghorne& Craig, 2004)**.

The pathogenesisof RRD is a complex process resulting frominherited and/or age-related changes in vitreousstructure and vitreoretinal adhesion, which predisposesto retinal break formation initiating separationof the neural retina from the underlying retinalpigment epithelium (RPE). The metabolic and physicalproperties of the RPE and neurosensory retina(NSR) in maintaining normal retinal adhesionare highly complex and once overwhelmed, causedisruption of normal photoreceptor anatomy, resulting in progressive visual loss **(Mitry& Fleck et al, 2010).**

The vitreous is a clear gel-like structure in the back of the eye composed of collagen fibrils and hyaluronic acid that slowly liquefies throughout life. These pockets of liquid can break through the posterior vitreous face and cause PVD from the retina. PVD is the most common cause of retinal tears which often lead to RRD **(Hikichi et al, 1995)**.Although typically an acute event, posterior vitreous detachment is a consequenceof life-long vitreous liquefaction and is highly age-dependent, occurring in less than10% of patients younger than 60 years of age but in 27% of patients in the seventhdecade of life and 63% of those in the eighth

decade of life**(Foos& Wheeler, 1982)**; it occurs earlier in patientswho have myopia**(Jaffe, 1968).**

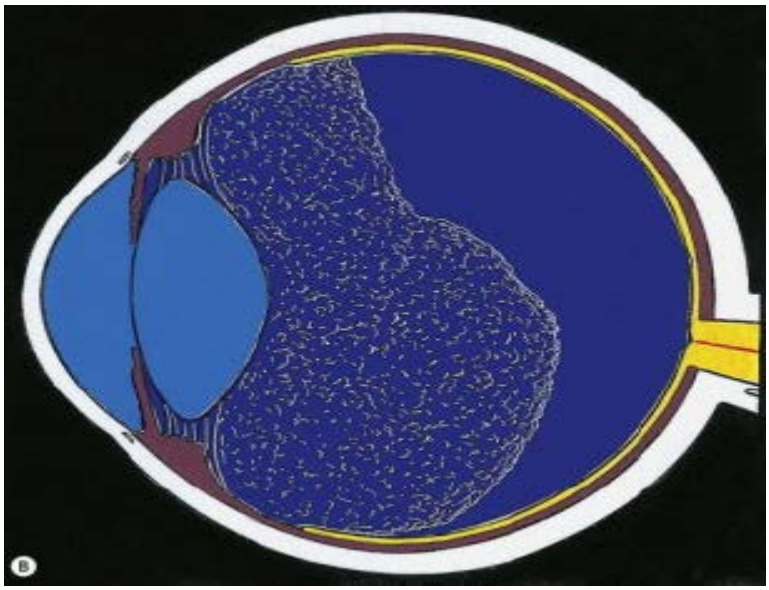

Fig. 1 : Diagram showing uncomplicated PVD.

(Jack J. Kanski& Brad Bowling)

Human vitreous undergoes an age-dependent processof liquefaction begining in the central vitreouswith the development of ‘‘lacunae’’ or pockets ofliquefied vitreous that coalesce **(Mitry& Fleck et al, 2010).**

Two progressive changes occur in the aging vitreous: synchysis (progressive increase in liquefied spaces) and syneresis (an increase in optically dense structures) **(Balazs et al, 1982)**. Ultrastructural studies suggest that thereis lateral fusion of collagen fibrils, resulting in visuallyperceivable aggregates. The fusion of these fibrilsresults in a redistribution of the collagen fibrils, withan increased concentration in the residual gel buta decreased concentration of fibrils in other areas, resulting in liquefaction **(Sebag&Balazs , 1989).**