Original Article

Risk Factors and Presentation of Giant Retinal Tear

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ABSTRACT

OBJECTIVE: To determine the risk factors, characteristics and presentation of Giant Retinal Tear.

DESIGN: Descriptive case-series study.

SETTING: Al-Ibrahim Eye Hospital, Isra Postgraduate Institute of Ophthalmology, Karachi; from January 2001 to July 2007.

METHODS: All patients diagnosed as having Giant Retinal Tear (GRT) in the Surgical Retina Clinic, were included in the study. The details of patients' demographics, ocular history, risk factors, refractive status, ocular examination, systemic examination, treatment offered and final outcome were recorded in a specially designed proforma.

RESULTS: A total number of 42 eyes of 38 patients with GRT was included in the study. The causative factors in our study were vitreo-retinal degeneration, blunt ocular trauma and complicated cataract surgery. Myopia was the most common ocular risk factor. Most of the patients presented to our hospital after 4 weeks of onset of symptoms with total retinal detachment, advanced proliferative vitroretinopathy and poor visual acuity. Pars Plana Vitrectomy with Silicone oil tamponade, with or without Scleral Buckling was performed in 35 eyes.

CONCLUSION: The major risk factors for GRT are peripheral retinal degenerations, high myopia, ocular trauma, GRT in the fellow eye, family history of retinal detachment, complicated cataract surgery and connective tissue disorders. Various socio-economic issues and inadequate patient counseling are responsible for late presentation of patients that leads to extensive PVR.

KEY WORDS: Giant Retinal Tear, Vitreo-retinal degeneration, PVR, RD.

INTRODUCTION

Giant Retinal Tear (GRT) is defined as a retinal break, which extends for at least 90 degrees around the circumference of fundus, in which the vitreous gel is attached to the anterior flap thereby allowing independent mobility of the posterior edge of the tear[1]. It is one of the less common causes of complicated Retinal Detachments (RD)[2]. RD due to GRT is followed by early and extensive Proliferative Vitreoretinopathy (PVR) [3]. Etiologically, GRT can be classified into 3 types: 1. Idiopathic, 2. Traumatic GRT, 3. GRT associated with vitreo-retinal degeneration. The ocular risk factors are same as those for other rhegmatogenous retinal detachments, i.e. high myopia, aphakia, pseudophakia and posterior capsulotomy. Systemic risk factors include connective tissue disorders, e.g. Marfan's syndrome, Ehlers-Danlos syndrome and Stickler's syndrome. Males are more commonly affected. Bilateral giant retinal tears are reported in about 10-15% patients[4]. Traditionally, the surgical treatment of GRT and the associated RD has been a difficult and complex problem for vitreo-retinal surgeons, producing unpredictable results, with regard to successful anatomic and visual outcome[5]. Because of the labor and expenses involved in the treatment of RD associated with GRT, it seems appropriate to identify the risk factors and to study the presentation of GRT in our setup. This will help in preventing the severe visual loss caused by GRT in the high risk population. The purpose of the study is to determine the risk factors, characteristics and presentation of giant retinal tear.

PATIENTS AND METHODS

This descriptive case-series was conducted at the Vitreo-retina Unit of Al-Ibrahim Eye Hospital, Isra Postgraduate Institute of Ophthalmology, Karachi, from January 2001 to July 2007. Forty-two eyes of 38 patients, diagnosed as having GRT, were included in the study. Ocular history was taken with specific inquiry regarding trauma, nature and duration of symptoms, glasses or contact lens wear and previous surgical or laser treatment received. Ocular examination included determination of Best Corrected Visual Acuity (BCVA) using Snellen's notation, refractive status and complete anterior and posterior segment examination. Retinal status was documented in terms of location and size of GRT, its radial extension, inversion of posterior flap, extent of RD, grading of PVR and type of vitreoretinal degeneration. All the patients were examined for any systemic disorder, with special

emphasis on the features of Marfan's syndrome, Ehlers-Danlos syndrome and Stickler's syndrome. Etiology and risk factors for GRT were identified for all the patients on the basis of history and examination. All the relevant information was recorded in a specially designed questionnaire. The details of management strategy offered, i.e. Pars Plana Vitrectomy with or without Scleral Buckling, were noted. The effect of preoperative risk factors, characteristics and presentation of GRT on the postoperative outcome were also noted for all the patients. The frequency of each variable was described in percentage.

RESULTS

A total number of 42 eyes of 38 patients with GRT was included in the study. Thirty-four (89.5%) patients had GRT in one eye while 4 (10.5%) patients had GRT in both eyes. There were 24 (68.5%) male and 12 (31.5%) female patients. Age range was 10-55 years, with average age of 26 years. The causative factors in our study were vitreo-retinal degenerations (Lattice degeneration and White without pressure), blunt ocular trauma and complicated cataract surgery **(Table I)**. Myopia was the most common ocular risk factor, present in 26 (62%) eyes, out of which 20 eyes had myopia more than 6 diopters. Two (5.2%) patients having bilateral GRT were diagnosed as having Marfan's syndrome, while 1 (2.6%) patient having unilateral GRT had Stickler's syndrome **(Table II)**. Retinal status and characteristics of GRT are presented in **Table III**. Most of the patients presented to our hospital after 4 weeks of onset of symptoms **(Chart I)**. Due to late presentation most of the patients had preoperative visual acuity of Hand motion (HM) or Light Perception (PL) **(Chart II)**. Thirty-five (83.3%) of the 42 eyes were offered surgical treatment. Standard 3-port Pars Plana Vitrectomy (PPV) with silicone oil tamponade was performed in 30 (71.4%) eyes, while combined PPV + Scleral Buckling was performed in 5 (12%) eyes. Five (12%) eyes required 2 surgical attempts, while in 1 (2.3%) eye, 3 attempts were made to achieve the desired outcome.

TABLE I:
AETIOLOGY OF GRT (n=42)

Aetiology	No. of Eyes (%)
Vitreo-retinal degeneration	23 (54.7)
Blunt ocular trauma	10 (23.8)
Complicated cataract surgery	3 (7)
Idiopathic	6 (14)

TABLE II:
SYSTEMIC ASSOCIATIONS (n=38)

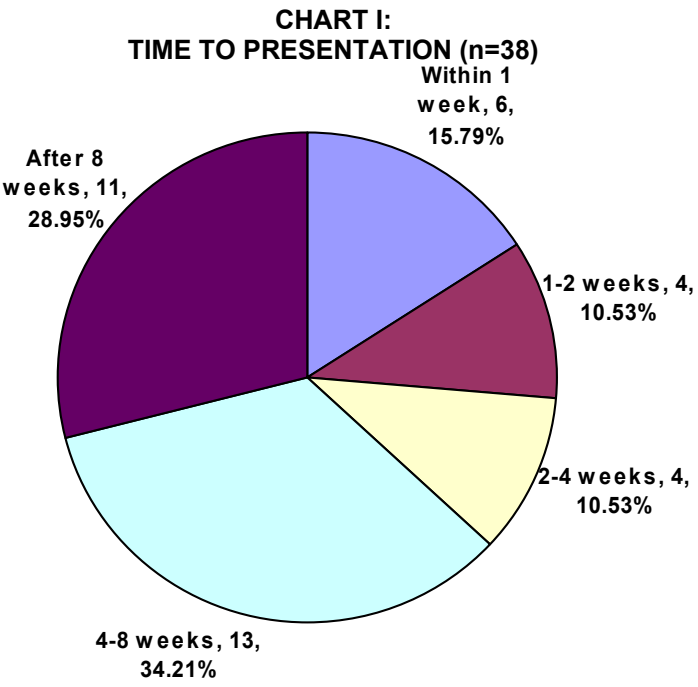
Systemic Association	No. of Patients (%)
Marfan's Syndrome	02 (5.2)
Stickler's Syndrome	01 (2.6)
None	35 (92.2)

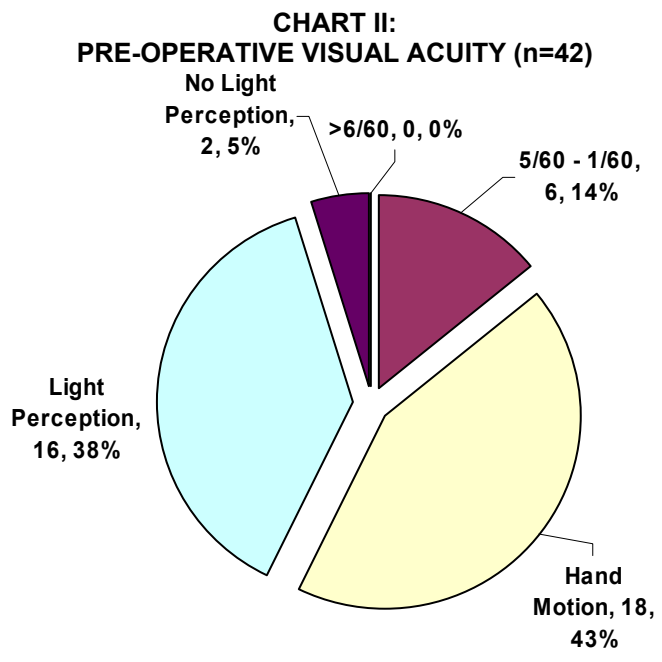
TABLE III:
RETINAL STATUS

Retinal Status	No. of Eyes (%)
Size of GRT	
90^o – 120^o	24 (57)
120^o – 180^o	08 (19)
$>180^o$	10 (24)
Status of Macula	
Attached	01 (2.3)
Detached	41 (97.6)
Extent of RD	
Total RD	36 (85.7)
Sub total RD	06 (14.3)
PVR Grade	
A	01 (2.3)
B	08 (19)
C	27 (64.2)
D	06 (14.3)

DISCUSSION

This was a case-series of 34 patients with unilateral GRT and 4 patients with bilateral GRT, presenting to a vitreo-retina centre in a tertiary care hospital, over a period of six and a half years. As the GRT is a relatively uncommon cause of rhegmatogenous RD, the number of subjects was quite limited. This study describes the predisposing factors for GRT, characteristics of GRT, and retinal detachment, and presentation of patients to the hospital. Giant retinal tear, as the name itself indicates, is a large tear in the retina. As the vitreous gel is attached essentially to the anterior flap, there is independent mobility of the posterior edge of the tear, leading to inversion of the posterior flap. GRTs complicated by PVR pose one of the most complex problems in vitreo-retinal surgery. Giant retinal tears are known to be mare common in young males[4]. In this study, the number of male patients was twice the number of female patients and most of the patients were in their teens or twenties. Bilateral GRT





developed in the fellow eyes of 4 (10.5%) of patients. Freeman HM[6] reported bilateral GRT in 13% of his patients. In Schepens' study[7], 70% of GRTs were idiopathic; 20% were traumatic and 10% were associated with retinal degenerations. The term Idiopathic GRT is applied to those cases that occur without predisposing peripheral retinal degenerations[6]. In contrast, this study shows that retinal degeneration (Lattice and White without pressure) was the commonest cause (54.7%), followed by trauma in 24% eyes. Idiopathic GRT was found in 6 (14%) non-myopic, phakic eyes. Posterior capsule (PC) rupture with vitreous loss during cataract surgery, which was inappropriately managed, led to GRT in 3 eyes. Family history of RD and high myopia (>6D) were frequent findings. Marfan's and Stickler's syndromes were found to be associated systemic risk factors. So, high risk of GRT is present in people with high myopia, GRT in the fellow eye, family history of RD, pseudophakia with inappropriately managed vitreous loss and connective tissue disorders. Detailed peripheral retinal examination, with indirect ophthalmoscope using scleral indentation, or with Goldmann 3 mirror, should be performed in these people; any vitreo-retinal degenerations and retinal breaks in these high risk people should be treated prophylactically with laser photocoagulation, cryotherapy or scleral buckling[4]. Early presentation of patients to our hospital was uncommon. Twenty-four (64%) of our patients presented after one month of onset of symptoms. Many of these patients initially attended eye clinics where vitreo-retinal services were not available, and were then referred to our hospital. This delay in presentation seems to be responsible for the retinal findings in our patients. All (except one) eyes had detached macula at the time of presentation. High incidence and long duration of macular detachment prior to surgery leads to poor visual outcome, despite successful retinal attachment surgery[1]. Most of the eyes had total RD with advanced (grade C or D) PVR at the time of presentation. Eighteen (44%) eyes had GRT extending for $\geq 120^{o}$. Preoperative visual acuity in 36 (86%) eyes was HM or worse. Late presentation of patients leads to high proportion of cases having total RD with macular detachment, extensive PVR and very poor preoperative vision[8]. Severe PVR is associated with poor preoperative vision because of epiretinal and subretinal membranes and fixed retinal folds extending on to the macula. Long duration of RD, large RD extent, severe preoperative PVR and poor initial visual acuity, all lead to poor surgical outcome[9]. Much progress has been made in the management of GRT over the past 3 decades. The initial surgical procedure performed was scleral buckling with air injection and prone posturing to unfold the posterior flap[2,10]. Currently, the management of GRT involves pars plana vitrectomy[11], with or without lensectomy[12], unfolding of inverted retinal flap, either by bimanual manipulation or by using heavy liquid (PFCL), endolaser photocoagulation and prolonged internal tamponade with gas or silicone oil[13-15]. Additional scleral

buckle in the form of circumferential explant is performed in selected cases[16]. Long-term postoperative follow-up is required because of risk or redetachment after successful surgery, either spontaneously after removal of silicone oil[17]. In this study, 7 eyes with advanced PVR and/or NPL vision were considered as poor prognostic cases and no intervention was done. Thirty-five eyes underwent PPV with silicone oil, with or without scleral buckling. While successful anatomical attachment of retina was achieved in about two third (67%) of the operated eyes. Significant visual improvement was seen in only about 40% of our cases. Fellow eyes of all the patients were examined and were treated prophylactically in selected cases. Most of our patients were unaware of the fact that they were prone to having retinal detachment because of their high risk status and that early surgical intervention is necessary for a successful outcome. Detailed history taking revealed that lack of awareness, poor socioeconomic background, limited vitreo-retinal services in public sector hospitals and inadequate patient counseling by ophthalmologists were the factors responsible for late presentation of patients at our hospital. While stressing the need for improved vitreo-retinal services at all tertiary care hospitals, the ophthalmologists themselves can certainly play their role by proper patient guidance and counseling. Prompt referral to a vitreo-retina centre and timely treatment of GRT patients will definitely improve the surgical outcome. The patients at high risk of GRT and retinal detachment must be examined thoroughly and regularly; they should be made aware of the risk and prophylactic treatment should be offered where indicated, so as to prevent this potentially blinding disease.

CONCLUSION

The major risk factors for GRT are peripheral retinal degenerations, high myopia, ocular trauma, GRT in the fellow eye, family history of RD, complicated cataract surgery and connective tissue disorders. Various socio-economic issues and inadequate patient counseling are responsible for late presentation of patients that leads to extensive PVR. Because of the fact that GRT mostly affects the young people and that it can be a bilateral, potentially blinding problem, it is very important to counsel the patient at risk and refer the patient promptly to a vitreo-retina centre.

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