

TIME TO SURGERY FACTOR FOR SUCCESSFUL RHEGMATOGENOUS RETINAL DETACHMENT TREATMENT

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ABSTRACT

Introduction: Rhegmatogenous Retinal Detachment (RRD) is a serious ocular disorder that may result in severe visual loss. The duration of macular detachment (DMD) has long been felt to impact postoperative outcomes.

Purpose: to describe the time to surgery and other clinical factors on outcomes following surgical repair of rhegmatogenous retinal detachments.

Methods: This was retrospective study which the data was obtain from patient's medical records who underwent surgery with diagnosis of RRD from October 1st to December 31th 2018.

Results: This study assessed 52 eyes from 52 patients, subjects was predominantly female (53.84%) with mean age 49 years old. The mean time from onset to surgery is 62.9 days with 75% underwent PPV surgery. 7 eyes retinal redetachment is occurred after repair (4 cases in 1-3 month time to surgery group).

Conclusion: The more longer delay interval of the onset to surgery could affect the outcomes of RRD treatment.

Keywords: retinal detachment, time to surgery

INTRODUCTION

Rhegmatogenous Retinal Detachment (RRD) is a serious ocular disorder that may result in severe visual loss. RRD incidence demonstrates significant geographical variation and its incidence has been reported to be between 6.3 and 17.9 per 100,000 population. Despite the high level of anatomic success of retinal reattachment surgery, the improvement of the central vision may remain compromised because of functional damages to the retina during the detachment period.¹⁻³

Animal models have demonstrated potentially irreversible changes occurring within multiple retinal layers including the photoreceptors, driven by inflammatory cascades initiated within minutes of retinal

detachment. The timing of such pathophysiologic processes suggests that, ideally, surgical repair of RRD would be performed before foveal detachment and it follows that time from presentation to surgical repair may correlate with ultimate outcomes.^{4,5}

In eyes with uncomplicated, primary, macula-off RRD, the duration of macular detachment (DMD) has long been felt to impact postoperative outcomes, Ross and Kozy recently examined results after SB in eyes with macula-off RRD of 7 days or fewer duration. They showed no statistically significant difference in postoperative anatomic reattachment or VA in eyes repaired anytime within the 1 week of macular detachment. Some studies

concluded that status of macula at the time of surgery and level of proliferative vitreoretinopathy (PVR) influence the anatomical and functional outcome after SB procedure. Duration of macula off does matter final visual recovery after uneventful buckling.^{3,4}

Aim of this study is to describe the time to surgery and other clinical factors on outcomes following surgical repair of rhegmatogenous retinal detachments.

MATERIAL AND METHODS

This is a retrospective observational study. The data involving patients of Vitreoretinal Unit, Cicendo Eye Hospital, Bandung, Indonesia, with diagnosis of Rhegmatogenous Retinal Detachment who underwent surgery between October 1st to December 31st, 2018. All types of RRD repair were included (PPV, scleral buckle, PPV+bare buckle). Exclusion criteria were history of prior retinal surgery, intraocular infection and other retinal disease than RRD. PVR was graded according to the Classification of the Retina Society Terminology Committee (1983).

In the baseline characteristic data were gender, age, lens status, initial visual acuity, and time from onset to surgery. Location of the break, macular status, grade of PVR, type of surgery and type of endotamponade were included in this study.

The pars plana vitrectomy with 23 gauge trocars using noncontact wideangle

viewing system. Trocars were placed 3-4 mm from limbus that allows peripheral vitrectomy to be performed without touching the lens, and also switching between the 3 entry sites. Endolaser photocoagulation using curved probe was applied either around the retinal tear or 360° to the vitreous base. Patient received sulfur hexafluoride (SF6) or silicone oil at the end of surgery.

The scleral buckle surgery was performed as a standard procedure including circumferential opening of the conjunctiva at the limbus, slinging of all four rectus muscles, location and marker of the intraocular retinal breaks is on the scleral surface, selective cryo coagulation of the retinal breaks and suturing of the episcleral buckle on the episcleral marked location of the retinal break after exodrainage of the subretinal fluid performed at the site of the scleral buckle. If at the end of surgery, the retinal break was still markedly detached from scleral indentation by the buckle, an air bubble or 0,4 mL of 20% SF6 gas was injected intravitreal.

All patient were operated by five experienced posterior segment surgeons and postoperative follow-ups were made at the Vitreoretinal Unit Cicendo Eye Hospital, Bandung, Indonesia. Data in this study was analyzed using Microsoft Excel 2016.

RESULTS

The total of 52 eyes from 52 patients with underwent surgery for RRD. The baseline characteristic is shown in Table 1. The gender distribution in this study were

53.84% female. The mean age of this study were 49.29 ± 13.67 years old with the most case happened in range 51-60 years old.

Table 1. Baseline Characteristics

Characteristic	Mean \pm SD	n (%)
Gender		
Male		24 (46.15)
Female		28 (53.84)
Age (years old)	49.29 ± 13.67	
≤ 40		13 (25)
41-50		11 (21.15)
51-60		19 (36.54)
61-70		9 (17.31)
Lens Status		
Phakic		49 (94.23)
Pseudophakic		3 (5.76)
Initial Visual Acuity	2.20 ± 1.06 log MAR	
Onset to Surgery	62.19 ± 58.73 days	
<1 week		2 (3.85)
<1 month		12 (23.08)
1 – 3 month		27 (51.92)
>3 months		11 (21.15)
First Visit to Surgery	32.73 ± 42.64 days	
<1 week		11 (21.15)
1 week – 1 month		22 (42.31)
1 – 3 months		17 (32.69)
>3 months		2 (3.85)

The mean initial visual acuity before primary RRD repair was 2.20 ± 1.06 log MAR. The time interval from onset to surgery is divided to 4 range and the most patient underwent surgery was 1 to 3 months group after their first onset of symptoms.

We also examine the location of retinal break, macular status, and grade of PVR in table 2. The most location of retinal break is on superior quadrant (28.85%). There

were 80.77% of RRD with macula-involvement, and 28.85% of PVR grade B.

Most of the surgical procedure is pars plana vitrectomy (75%), with silicone oil as the most common endotamponade (67,31%). We also examined the outcome of the RRD management which are the occurrence of retinal redetachment. There were 7 eyes with retinal redetachment, with the most common occurred in onset to surgery group 1 – 3 months.

Table 2. Location of retinal break, macular status, and PVR

Location	n (%)
Superior	15 (28.85)
Inferior	8 (15.38)
Nasal	3 (5.77)
Temporal	14 (26.92)
Unidentified	12 (23.08)
Macular Status	n (%)
Macula On	10 (19.23)
Macula Off	42 (80.77)
PVR	n (%)
Grade A	4 (7.69)
Grade B	15 (28.85)
Grade C	4 (7.69)
Unidentified	29 (55.77)

Table 3. Types of surgery & endotamponade

Types of Surgery	n (%)
PPV	39 (75)
SB	11 (21,15)
BB + PPV	2 (3,85)
Endotamponade	n (%)
Silicone Oil	35 (67,31)
SF6	14 (26,92)
C3F8	3 (5,77)

Table 4. Onset to surgery & redetached retina

Onset to Surgery	Redetached (n(%))
<1 week	0 (0%)
<1 month	1 (1.92%)
1 – 3 month	4 (7.96%)
>3 months	2 (3.84%)

DISCUSSION

Mitry et al study that while some reports indicate a sex distribution corresponding with that of the general population, most indicate a preponderance of men, and a minority find that women predominate in the phakic nontraumatic group. A large Singapore study found that men are twice as likely to require surgery. This may be related to an inherent sex-related risk, though an increased rate of ocular trauma was contributory. The largest annual incidence rate of RRD is seen in the elderly, with studies supporting a bimodal distribution and a secondary peak in younger ages (20-30 years) attributed to highly myopic patients. The highest

incidence rate of RRD was found in the 60-69 years-old age.^{7,8} In this study the sex gender is dominated by women (53.84%) and majority occurred in 51-60 years old age group (36.54%).

A major impact on the functional outcome of retinal detachment surgery is whether the macula is still attached or is part of the detachment. After a macula-off retinal detachment, improvement of central vision often remains compromised owing to the permanent functional damage the macula has suffered while detached. Photoreceptor apoptosis has been reported to mainly occur within 3 days of RRD onset in experimental animal models. The timing

of such pathophysiologic processes suggests that, ideally, surgical repair of RRD would be performed before foveal detachment and it follows that time from presentation to surgical repair may correlate with ultimate outcomes. To the contrary, and somewhat counter-intuitively, several retrospective studies have documented little correlation of time from fovea-sparing RRD diagnosis to surgical repair with outcomes. Frings et al. studied that after 10 days of central visual acuity loss, the final visual outcome is clinically comparable and independent of further delay of surgery up to 30 days. Ehrlich et al. studied that modest delay in timing of surgery for macula-on rhegmatogenous retinal detachment did not adversely impact on patients outcome. Similar result by Wycoff et al, they did not find a relationship between timing of surgery and postoperative acuity or single procedure success rate. Khanzada et al studied that mean postoperative BCVA in immediate & early groups (1-2 weeks) were significantly better compared to the intermediate, delayed and late groups (4 weeks, 6 weeks, ≥ 6 weeks).^{6,8-10} In this study, 80.77% cases presented with macula involving, and mean time from onset to surgery is 62.19 days.

RRD is one of the known complications with strong clinical association with prolonged or complicated cataract surgery. This is due to a higher rate of PVD after cataract extraction and a lower hyaluronic acid concentration causing vitreous collapse. Although the incidence of RRD after phacoemulsification cataract surgery is estimated to be only 0.16% - 2.31% at 7-10 years, it is estimated that there is a four to nine times increased risk of developing a RRD after 8-20 years of cataract extraction compared with age matched phakic eyes. In this study, 94.23% were phakic eyes.^{11,12}

Several surgical techniques have been used successfully for two decades to repair rhegmatogenous retinal detachment. The modern scleral buckling procedure is considered the treatment of choice for most cases, unless proliferative vitreoretinopathy is present. However, as facilities for vitreous surgery have become more widely available and surgeons have become more experienced with this technique, the threshold for vitrectomy has fallen and the indication for primary vitrectomy for retinal detachment widely overlaps that for scleral buckling. Recently, the final anatomic success rate has been reported to be over 90% for both procedures..¹³ In this study, 75% eyes underwent pars plana vitrectomy.

CONCLUSIONS

The more longer interval of the onset to surgery seems to affect the outcomes of RRD treatment.

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