

## CLINICAL CHARACTERISTICS OF VITRECTOMY PATIENTS IN THE CASE OF RHEGMATOGEN RETINA DETACHMENT IN PROF DR R D KANDOU CENTRAL GENERAL HOSPITAL, MANADO

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### Abstract

**Introduction:** Rhegmatogenous retinal detachment (RRD) is an ophthalmology urgency that can cause blindness if treated late. Incidence of RRD has increased overtime. We describe the clinical characteristics of vitrectomy patients in RRD cases at dr. R. D. Kandou Hospital, North Sulawesi Province, Manado City, Indonesia.

**Methods:** The study was conducted based on a retrospective search on the medical record data of 72 RRD patients who underwent vitrectomy within June 2018 until June 2020.

**Result:** Most of the participants were male, with total of 43 patients (59.70%) Where the majority of the samples were from age group 51-60 years (33 patients). Moreover, the eyes affected by RRD were mostly right eyes as many as 41 patients (56, 9%) with the location of the break was mainly the superotemporal area in 28 patients (38.9%). Furthermore, the status of the macula was dominantly macular off counted as 44 patients (61.10%) the anesthesia used was local anesthesia in 69 patients (95.80 %), meanwhile, the time taken for the procedure was quiet long with more than 1 month for all patients.

**Conclusion:** The clinical characteristics of RRD patients at dr. R. D. Kandou Hospital are mostly consistent with previous studies in several places in the world. Older age as well as male patients were more susceptible to RRD. However, Time to do vitrectomy need to be evaluated and corrected to improve visual prognosis.

**Keywords:** Rhegmatogenous Retinal detachment

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### INTRODUCTION

Retinal detachment is the detachment of the retinal neurosensory tissue from the underlying layer. Rhegmatogenous retinal detachment (RRD) is a type of retinal detachment characterized by a tear in the retina. RRD is a condition that can lead to blindness if not treated.<sup>1</sup> RRD is an eye urgency that requires immediate treatment. Surgery performed on the RRD eye with high visual acuity has better outcome in compared to the low visual acuity ones.<sup>2</sup>

The incidence of RRD in the world reaches 10.9 cases per 100,000 population in Asia, lower than 13.3 cases per 100,000 population in Europe. The median age of RRD cases is 50 years in men and women in Asia and 60-70 years in Europe. <sup>3,4</sup> the incidence of RRD has also increased over time.<sup>5</sup>

Simple RRD is characterized by a small tear in the peripheral retina followed by good visualization of the fundus. RRD Complex consist of the following signs of extensive detachment either subtotal or total with multiple tears, posterior tears, presence of retinal dialysis or major tears, vitreous hemorrhage, eye trauma or proliferative vitreoretinopathy. <sup>6</sup> There are a few therapeutic procedures for RRD cases such as pars plana vitrectomy, scleral buckle and pneumatic retinopexy.<sup>7</sup>

These therapeutic options for RRD have their advantage and disadvantages. Pars plana vitrectomy is currently the most popular procedure to treat RRD compared to scleral buckle and pneumatic retinopexy right now. This procedure involves removal of the vitreous to remove traction continued with Gas bubble or silicone oil injection as a tamponade to ensure attachment of the retina. Similar to pneumatic retinopexy, patient then have to maintain particular head position to ensure tamponade function adequately. Unfortunately, Silicone oil will need further surgery for the evacuation while gas bubble will have certain period to resorb. Pneumatic retinopexy as mentioned before is a minimal invasive procedure relying on gas tamponade. However, this procedure still access the intraocular space. scleral buckle procedure on the other hand uses silicone explants which are sutured to the external sclera. This procedure done without accessing intraorbital space. Thus, this procedure preserves crystalline lens and does not need positioning after surgery compared to PPV or pneumatic retinopexy. <sup>8-10</sup>

The choice of therapeutic option is still debatable. Primary Rhegmatogenous Retinal Detachment Outcomes Randomized Trial (PIVOT) found that PPV excel in showing great success in 12 months post-surgery for 93,2% patients while pneumatic retinopexy only achieve 80,8%.<sup>8</sup> PPV also have a

greater success rate compared to scleral buckle. This comparison referred to 90,8% in scleral buckle and 93,1% in PPV.<sup>9</sup>

## METHODS

This study is a retrospective descriptive study on medical record data in the retinal subdivision of the Prof dr R D Kandou Central General Hospital, Manado. The research subjects were all medical record data of patients with a diagnosis of Rhegmatogen Retinal Detachment (RRD) who underwent vitrectomy in the period of June 2018 to June 2020. The exclusion criteria in this study are medical records that are incomplete and indecipherable. The variables observed are both gender; male and female, age in years, Laterality to the right or the left eye, the location of the break, and the location of retinal tear. The location of the break is divided into four locations: no break found, inferior, superotemporal and superonasal. The break that is included in the assessment is a primary break and is not an iatrogenic break that may occur during the operation. While the macula status is classified into macula on (attached macula) and macula off (detached macula). The results of the study are described in the form of a data frequency distribution table to the describe the clinical characteristic.

## RESULTS

This study found 72 medical record files that met the research criteria

The results (table 1) showed that the most genders included in the criteria as seen on this study were male as many as 43 people (59.7%), and female 29% (40.3%), the most age was in the age range of 51 to 60 years old as many as 33 people (45,83%), followed by the age range of 61-70 years old as many as 15 people (20,83 %). Laterality of RRD cases was dominated by right eye for 41 people (56.90%) and 31 people (43.10%) for left eye. Most of the break locations were in the superotemporal area as many as 28 people (38.90%), inferior as many as 22 people (30.60%), superonasal as many as 13 people (18.1%) and no break was found in 9 people (12, 5%). Macula on status was found in 28 people (38.9%) and macula off in 44 people (61.10%).

The type of anesthesia used consisted of local anesthesia in 69 people (95.8%), general anesthesia in 3 people (4.20%). Time of surgery was 72 people (100%) were done after 1 month.

Table 1. study result

Variable	Frequency (n)	Percentage (%)
<b>Gender</b>		
Male	43	59.70%
Female	29	40.3%
<b>Age (year)</b>		
<30	3	4,17%
30-40	5	6,94%
41-50	9	12,50%
51-60	33	45,83%
61-70	15	20,83%
>70	7	9,72%
<b>Laterality</b>		
Right	41	56,90%
Left	31	43,10%
<b>Break location</b>		
Not Found	9	12,50%
Inferior	22	30,60%
Superotemporal	28	38,90%
Superonasal	13	18,10%
<b>Macula status</b>		
Macula on	28	38,90%
Macula off	44	61,10%
<b>Anaesthetic type</b>		
Local	69	95,80%
General	3	4,20%
<b>Surgery time</b>		
< 1 month	0	0,00%
> 1 month	72	100,00%

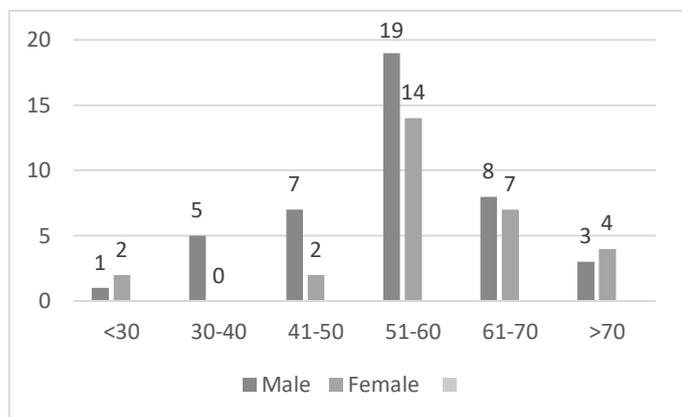


Figure 1. Distribution of 72 patients with rhegmatogenous retinal detachment in different age groups

Male group dominates the overall age group of RRD patients except in the age group below 30, 30-40 and above 70.

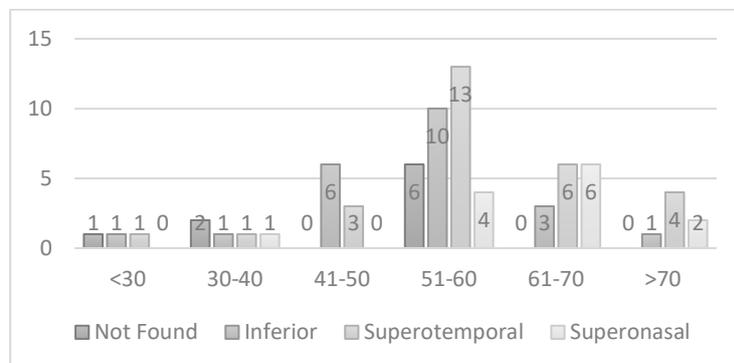


Figure 2. Age distribution for each break location.

The age distribution for each break location was dominated by superotemporal at the age range of 51-60 years, inferior at the age of 41-50 years, superonasal at the age above 70 years.

DISCUSSION

The study showed that most of the gender were male, with a male to female ratio of 1.48:1. This dominance was also found in almost all age groups of RRD patients (figure 1). This finding is consistent with previous studies in several area of the world.<sup>5, 11-14</sup> The majority of RRD cases in male is associated with longer axial length of the eyeball in comparison to female eyeball and the higher risk of trauma in daily activity.<sup>15, 16</sup>

Most of the ages in this study were dominated by the age group 51-60 years old and age group 61-70 years old and the trend decline on population older than 70 years old. This finding is in line with other studies.<sup>15</sup> One explanation for this finding is the process of vitreous liquefaction and the occurrence of a posterior vitreous detachment process.<sup>17</sup> The vitreous liquefaction process is known to begin at the age of 40 years to 70 years with an average rate of 55 years.<sup>18</sup>

This study showed that RRD was more common in the right eye than the left eye with a ratio of 1.33:1. This result is in accordance with several other studies.<sup>5, 19, 20</sup> The right eye is often the dominant eye and is also more often in a myopic state.<sup>19, 21</sup> This laterality might be related to the fact that the non-dominant eye is known to tend to blink more. This causes, the dominant eye tends to get more solar radiation than the non-dominant eye.<sup>20, 22</sup> Long-term exposure to sunlight can increase the risk of retinal detachment.<sup>23</sup> The right eye also tends to be larger, so it has a greater risk of RRD than the left eye. This is also related to the condition of myopia experienced by the patient.<sup>19, 21</sup> In addition, differences in the vasculature of the right and left eyes related to the flow of the left carotid vessels which are direct branches of the aorta are also possible but this is still debated.<sup>20</sup>

The break location in this study was dominated by the superotemporal and inferior regions followed by the superonasal in almost all age groups, especially in the age range of 51 -60 years (figure 2) which in line with the previous study conducted in 844 patients. This might be related with the sequential process of Posterior Vitreous Detachment which starting in superotemporal quadrant.<sup>24</sup> The break in the superotemporal area is also associated with a lower success rate of the operation than breaks in other areas. There is no evidence support the cause of this rate but it might be related with gravity.<sup>25</sup> we have known that retina attached strongest in ora serrata, optic nerve and macula. If we take this into consideration, the distance between ora serrata and optic nerve has its longest distance in superotemporal quadrant. This put superotemporal quadrant into the weakest point of retinal attachment especially in long axial length.

A total of 12.5% of eyes with RRD in this study had an unidentified break on ophthalmological examination. Another study reported also reported similar findings that 11.6% of RRD patients did not have a retinal tear at the time of examination.<sup>26</sup> Peripheral retinal degeneration might be the reason why the break cannot be found on fundus examination. This micro break is one of the risk factors for RRD is difficult to be identified on fundus

examination. However, Peripheral retinal degeneration such as lattice degeneration, retinoschisis, cystic retinal tufts, and zonular traction tufts can lead to RRD.<sup>27</sup>

This study shows that most RRD patients have macular off status. Macular off status is associated with poor visual acuity prior to surgery as well as poor post procedural prognosis and visual acuity. This disorder can be in the form of metamorphopsia or binocular double vision.<sup>28-30</sup>

Anesthesia used for pars plana vitrectomy were mostly general anesthesia. Along with the development of surgical techniques and instruments, the trend of using general anesthesia is decreasing and being replaced by a trend of local anesthesia. Local anesthesia on the other hand has several advantages over general anesthesia such as shorter duration of surgical preparation, rapid recovery period, less need for operating room facilities like recovery room and intensive care unit following procedure, and cost efficient.<sup>31-33</sup> The total cost for a vitrectomy procedure in Indonesia is known to be reduced by up to 46.6% with the use of local anesthesia compared to general anesthesia.<sup>33</sup>

This study showed that the timing of the procedure for all RRD patients occurred after one month. The time at which RRD is treated is an important predictor of surgical success and restoration of vision. Surgery is expected to be performed less than 72 hours after the initial symptoms. surgery taken during this period give better prognostic results than after.<sup>2</sup>

This study did not get data on the reasons why the time for all of the surgeries were more than 1 month. Delayed surgery can occur in several stages of the process starting from the initial process depending on the patient's ability to recognize first signs such as floaters, seeing flashes of light, or loss of visual field. Awareness of these first symptoms is accompanied by the time required to report this incident to the doctor, the referral process to an ophthalmologist, the process of preparing for surgery, and the surgery itself.<sup>34</sup>

## CONCLUSION

The clinical characteristics of rhegmatogenous retinal detachment patients who went on vitrectomy at Prof dr R D Kandou Hospital are in accordance with other studies that has been conducted. Most of the surgeries are performed using local anesthesia which can lead to cost efficiency. Overall Vitrectomy was performed after 1 month of symptoms. These findings emphasize the importance to get more attention in identifying causative factors of surgery delay, increasing health promotion about RRD and improving the health management system.

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