

## RESEARCH ARTICLE

# The effect of the COVID-19 pandemic on procedures performed by fellows of the Vitreo-Retina Training Program at the Philippine General Hospital

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### ABSTRACT

**Background:** The COVID-19 pandemic has affected ophthalmology training. The Vitreo-Retina Training Program extended the training periods of its trainees in anticipation of a drop in surgical cases during the pandemic to make up for the expected drop.

**Objective:** This study aimed to determine the effect of the COVID-19 pandemic on the Vitreo-Retinal Fellowship Program at the Philippine General Hospital (PGH), specifically the number of procedures performed by the Vitreo-Retina Fellows before and during the pandemic and their compliance with the Vitreo-Retina Society of the Philippines (VRSP) standards.

**Methodology:** This is a document review of vitreo-retinal procedures done at the Department of Ophthalmology and Visual Sciences of the PGH from January 1, 2017, to December 31, 2021.

**Result:** During the COVID-19 pandemic in 2020, there was a drop in the number of procedures performed by both the first year and second year vitreo-retina fellows. Despite the drop in numbers, the first year vitreo-retina fellows were still in compliance with the VRSP-recommended number of procedures. The second year vitreo-retina fellows, on the other hand, were not able to comply with the recommended numbers by the VRSP. The extension year allowed the second year fellows to do more procedures and comply with the recommended numbers of pars plana vitrectomy only.

**Conclusion:** There was a drop in the vitreo-retinal procedures during the COVID-19 pandemic. The second-year fellows were the most affected with the decrease in the number of surgical cases.

**Keywords:** COVID-19, Vitreo-Retina training, Vitreo-Retina Procedure, Ophthalmology, Philippine General Hospital, Vitreo-Retina Society of the Philippines

## Introduction

The Coronavirus-19 Pandemic has affected all sectors of society all over the world. The rising numbers of affected individuals and deaths have led the health care system to focus on the disease, relegating other conditions to the background. Different hospitals and training institutions adjusted their policies on patient care, consults, admissions, and surgeries.

On March 19, 2020, the Department of Health designated the Philippine General Hospital as a COVID-19 referral hospital [1]. The hospital's administration and all its departments had to institute changes to accommodate not only COVID-19 cases but also patients requiring specialized care. Healthcare workers had to adjust to new healthcare standards, work

schedules, and assignments. To avoid crowding and maintain social distancing between patients, outpatient consultations, including diagnostic procedures, had to be limited while surgeries were minimized. Emergent and urgent procedures were prioritized. Medical staff and trainees were deployed to the COVID wards, emergency room, and triage. Aside from the new hospital regulations, the lockdowns and restrictions by the government also deterred patients from coming to the clinics and hospitals for consultations. Since the Philippine General Hospital is also a training hospital, specialties not directly involved in COVID-19 care were greatly affected [2,3].

The Vitreo-Retina (VR) is a highly technical sub-specialty. It involves microsurgery that requires actual hands-on

experience for acquiring the skills to manage the complex cases. The retina is the neural component of the eye that receives input from the environment, processes it, and transmits it to the brain for interpretation. Like most neural components of the body, damage to it is irreversible.[4] The vitreous is the gel-like component which provides structural support to the eye and the retina and its clarity allows an ophthalmologist to view the retina. Before one can access the retina during surgery, the vitreous has to be dealt with [4]. Prompt management of conditions requiring treatment, such as retinal detachments, vitreous hemorrhage from diabetes and other vaso-occlusive diseases, neovascular macular degeneration, retinopathy of prematurity, and trauma or intraocular infection will have an impact on the patients' vision [5-8]. Because of the importance of duration from symptom to management, VR diseases were classified as urgent eye conditions needing prompt management by the Philippine Academy of Ophthalmology (PAO). Vitreo-Retina (VR) procedures such as Pars Plana Vitrectomy, Scleral Buckling, Pan Retinal Photocoagulation via slit lamp, Laser Indirect Ophthalmoscopy and Intravitreal injection of anti-VEGF medications were among the listed urgent procedures by the PAO [9]. The PAO is the only Philippine ophthalmologic society recognized by the Philippine Medical Association and International ophthalmologic societies. The PAO provides guidelines on the ethical practice of ophthalmology, and provides its members a venue for continuing education and academic discourse. The Vitreo-Retina Society of the Philippines (VRSP) is a subspecialty society under the PAO composed of certified VR specialists. The society provides venues for academic discourse on the topic relating to VR conditions. The society also provides guidelines for training institutions with VR Training Programs. Although the VRSP is not a policing body, it has provided guidelines for training institutions in their desire to standardize VR Training. The guidelines state the ideal number of consultants relative to the number of trainees and what equipment or machines the training institution must have. Aside from this, the VRSP has also set a guide on the kind and number of procedures recommended per trainee as a benchmark [10]. At present, there is no standard way of assessing a Vitreo-Retina program. One measurable factor is the number of procedures performed by the trainee [11].

With the conversion of the PGH into a COVID-19 Referral Center, internal reorganizations were implemented [2]. In response to the anticipated drop in both clinical and surgical cases, the PGH Department of Ophthalmology and Visual Sciences extended both the Residency and Fellowship programs so that residents can fulfill the required number of

cases prescribed by the Philippine Board of Ophthalmology and the fellows will have enough exposure to subspecialty cases [12].

This study aimed to determine the effect of the pandemic on the Surgical and Laser Census of a Vitreo-Retinal Fellowship Program at a Philippine tertiary hospital designated as a COVID-19 Referral Center. It specifically sought to compare the kind and number of procedures performed by the Vitreo-Retina fellows before and during the COVID-19 pandemic and if they were still within the recommended number suggested by the VRSP. The study also evaluated whether the extension period was able to increase the number of procedures done by the fellows to the pre-pandemic levels and help them comply with the VRSP standards.

It is hoped that the result of this study would help guide the Department and other training institutions with a VR Training Program on what to do in case a similar disruption in the training program occur in the future.

## Methodology

Approval from the University of the Philippines Manila Research Ethics Board (UPMREB) was sought prior to the conduct of the study.

This study is a document review of Vitreo-Retina procedures done at the Philippine General Hospital. The study was conducted at the PGH Department of Ophthalmology and Visual Sciences (DOVS) that offers both the Ophthalmology Residency Training Program and various subspecialty training programs, one of which is the Vitreo-Retina.

The VR Fellowship program of the PGH is a two-year program recognized by the VRSP. Consultants who train these fellows are part of the faculty of the University of the Philippines, College of Medicine. They are board-Certified ophthalmologists with VR Fellowship training. Applicants to the program are required to be board-certified ophthalmologists. Two applicants are accepted annually into the Fellowship program. During the first year, the fellows are called Medical Retina (MR) fellows and are expected to see patients and be able to perform Laser Photocoagulation via slit lamp, Laser Photocoagulation by Indirect Ophthalmoscopy and Intraocular injections of medications [13]. Occasionally, Phacoemulsification cases are decked to a fellow especially if the consultant in charge considers it a complicated case. Phacoemulsification cases are typically given to residents.

During their second year of training, fellows are called Surgical Retina (SR) fellows and they are expected to be able to perform retinal surgeries such as Scleral Buckling, Pars Plana Vitrectomy, Pneumatic Retinopexy and Silicone oil removal with or without Phacoemulsification [13]. Because of the COVID-19 pandemic, no new VR fellows were accepted for the year 2021.

The study extracted data from two main sources, the Operating Room (OR) logbook and the Eye Instrument Center (EIC) logbook. The OR logbook contains all surgical procedures, including intraocular injections done at the OR. It contains the patient's name and demographics, the procedure/s performed, surgeon, 1st assists, anesthesiologist, if any, and the scrub nurse. The EIC logbook contains data on procedures done at the Eye Instrument Center which houses the laser machines. Only data on the kind of procedure, number of procedures done, and year level of training of the fellow who performed the procedure were extracted. Data from January 2017 to December 2021 were included and clustered as before the pandemic (2017-2019), during the pandemic (2020), and the training extension period (2021).

VR procedures performed were classified into groups based on the basic procedural technique. These are: laser photocoagulation using the slit lamp, laser photocoagulation using indirect ophthalmoscopy, intraocular injection, Scleral buckling, Pars plana vitrectomy Pneumatic Retinopexy, Silicone oil removal and Phacoemulsification. The number of procedures done using the classification and the year level of the fellow who performed them were noted.

Microsoft Excel was used to tabulate the data, calculate and compare frequencies and averages, compute the percentage of decrease, and generate the bar and linear graphs and tables.

## Results

A total of 267 and 345 VR procedures were done in 2020 and 2021, respectively. Comparing this to the average of three years pre-pandemic, there was an overall decrease from 778 cases to 267 cases (66%) in 2020 and to 345 cases (56%) in 2021.

The number of Phacoemulsification cases done by the MR fellows suffered the largest drop from 25 cases to 5 cases in 2020 (83%) and to zero case in 2021. This figure, however, does not reflect the total number of phacoemulsification cases since this number does not include cases done by the residents. This

is followed by the Laser indirect ophthalmoscopy procedures which decreased from 15 cases pre-pandemic to 4 (77%) and 3(80%) in 2020 and 2021 respectively. Intraocular injections, which constituted the bulk of the MR fellows' procedures, dropped from 323 pre-pandemic to 103 (68%) and 63 (80%) in 2020 and 2021 respectively. Laser photocoagulation via slit lamp dropped from 97 cases pre-pandemic to 49 (50%) but showed an increase in 2021 from 97 to 101 cases or a 4% increase (Table 1).

Among the SR fellows procedures, the largest drop in number in 2020 was pars plana vitrectomy (72%), followed by scleral buckling (9%), silicone oil removal (25%) and pneumatic retinopexy (14%). The number of procedures in 2021 was a little better with the decrease in numbers less than 50% in all procedures except for pars plana vitrectomy which showed a decrease of 54% compared to the pre-pandemic numbers. There was, however, an increase in the number of silicone oil removal in 2021 (Table 2).

Despite the pandemic, the number of intraocular injections done by the MR fellows was still at par with the VRSP recommendation. In 2021, only the number of laser photocoagulation via slit lamp performed reached the VRSP recommendation. Considering the one-year extension, the cumulative number of procedures from 2020 and 2021 of the MR fellows was at par with the VRSP recommendation (Table 3).

Taking into account the number of procedures recommended by the VRSP, in 2020, the SR fellows fell below the set standard of the VRSP. In 2021, Only the number of pars plana vitrectomy reached the number recommended by the VRSP. When the training period was over, the cumulative procedures of 2020 and 2021 were taken into consideration and compared with the VRSP recommendation. Results showed that despite achieving the pre-pandemic numbers, except for Pars plana vitrectomy, the total number of procedures performed by the SR fellow from 2020-2021 was still below the VRSP recommendation (Table 4).

## Discussion

This paper examined the number of Vitreo-Retina procedures performed during the COVID-19 pandemic. It also evaluated the effect of the one- year extension of training on the total number of procedures done by the VR fellows. A comparison with the VRSP-recommended number of procedure was done to see if the pandemic affected the compliance of fellows with the VRSP standard

**Table 1.** Average Number of Procedures Performed by Medical Retina Fellows

Procedures	Year		
	Prepandemic (2017-2019)	2020	2021
Laser photocoagulation via slit lamp	97	49	101
Laser indirect ophthalmoscopy photocoagulation	15	4	3
Intraocular injection	323	103	63
Phacoemulsification	26	5	0
<b>TOTAL</b>	<b>461</b>	<b>160</b>	<b>167</b>

**Table 2.** Average Number of Procedures Performed by Surgical Retina Fellows

Procedures	Year		
	Prepandemic (2017-2019)	2020	2021
Scleral Buckling as part of pars plana vitrectomy or as a separate procedure	40	13	27
Pars plana Vitrectomy and associated techniques	242	68	111
Pneumatic Retinopexy	4	3	3
Silicone oil removal with or without Phacoemulsification	31	23	37
<b>TOTAL</b>	<b>317</b>	<b>107</b>	<b>178</b>

**Table 3.** Average Number of Procedures Performed by Medical Retina Fellows and VRSP recommendation

Procedures	Year				VRSP Recommendation
	Prepandemic (2017-2019)	2020	2021	2020+2021	
Laser photocoagulation via slit lamp	97	49	101	150	100
Laser indirect ophthalmoscopy photocoagulation	15	4	3	7	6
Intraocular injection	323	103	63	166	100
<b>TOTAL</b>	<b>435</b>	<b>155</b>	<b>167</b>		

**Table 4.** Average Number of Procedures Performed by Surgical Retina Fellows and VRSP recommendation

Procedures	Year				VRSP Recommendation
	Prepandemic (2017-2019)	2020	2021	2020+2021	
Scleral Buckling as part of pars plana vitrectomy or as a separate procedure	40	13	27	40	50
Pars plana Vitrectomy and associated techniques	242	68	111	179	100
Pneumatic Retinopexy	4	3	3	6	12
<b>TOTAL</b>	<b>286</b>	<b>84</b>	<b>141</b>		

and if the extension was necessary in terms of the total number of procedures performed.

The results showed a general decrease in the total number of VR procedures done in 2020. A breakdown of the procedures showed that the Phacoemulsification cases had the biggest drop. This can be partly or mainly due to the fact that this procedure is a requirement in residency training so that priority is given to the residents who needed the numbers for certification. Among the procedures solely done by the VR fellows, the biggest drop among the MR fellow procedure was laser indirect ophthalmoscopy. Since this procedure is mostly done on premature infants with Retinopathy of Prematurity, the number of cases will be influenced by the number of premature births delivered in the hospital or the number of premature babies referred to the hospital. Among the SR fellows, the pars plana vitrectomy and scleral buckling procedures showed the biggest drop in 2020. These two cases are considered long cases and in the case of scleral buckling, it can be painful. Depending on the perceived complexity, the two procedures are often or sometimes done under general anesthesia which is an aerosol-generating procedure and with a higher risk of COVID-19 transmission.

The reason for the drop in the number of VR procedures can be varied and either solely due to the COVID-19 pandemic and fear of getting the infection. Since the PGH was designated as a COVID-19 referral center, this may have added to the fear of getting infected. Other factors such as the nationwide restrictions caused transportation problems, limiting the number of people who are able to venture out of their homes. The decrease or loss of income and lack of effective access to the Internet may have contributed as well, as these caused difficulty in scheduling appointments online. Lastly, the required COVID-19 testing prior to undergoing the procedures is not only burdensome, but is a source of fear as well, because one might be discovered to be COVID-19 positive and be placed on mandatory isolation or quarantined.

There are no studies reporting the quantitative impact of Covid-19 on Vitreo-Retina Fellowship training in the Philippines. Some foreign studies have explored the effect of COVID-19 on ophthalmology training in general based on surveys and trainees' perception. Clements *et al.* did a study on the quantitative impact of the COVID -19 pandemic on surgical training in the United Kingdom. They compared the number of surgeries done from April 1 to December 31, 2020 to the numbers in the same time period in 2019. Data

was gathered through an e-logbook. Their finding showed an overall decrease in all surgical specialties during the time period [14]. However, ophthalmologic surgeries were not included in the study.

The study by Sora *et al.*, a nationwide survey on Filipino ophthalmology trainees on the perceived effects of the pandemic shows that in general, the trainees felt that there was more than a 50% decrease in their surgical training [15]. This study considered all types of ophthalmologic surgery and respondents were both residents and fellows. Among the procedures evaluated, only intravitreal injections was related to Vitreo-Retina and there was no data on the type of trainee who responded. The study did not compare the actual numbers of procedure and the reported reduction in surgeries was based on the respondent's perceived decrease. Similarly, foreign studies have also reported a drop in the number of cases but the conclusion was not substantiated by the numbers based on the paper published with the study period shorter than that of Sorra *et al.* [16-18]. In the study by Khan *et al.* on United States Vitreo-Retina Fellows, 98.4% of the respondents expected a reduction in surgical case volume [19].

Breazzano *et al.*, studied the frequency of Urgent or Emergent VR procedures in the United States during the COVID-19 pandemic. The study was on institutions doing VR procedures and no distinction was made if the procedures were done by consultants or trainees. The data source was based on the procedure codes reported by each institution. The study conducted from January 2019 to May 03, 2020 wanted to see the pattern of weekly decrease or increase of procedure during the early part of the pandemic and compared the numbers to the data of the previous year. Results showed a 38.6% decrease in intraocular injections, 9.4 % decrease in retinal detachment surgery, 79.6% decrease in laser procedures and 84.3% decrease in pars plana vitrectomy [20].

Bromeo, *et al.*, did a survey on the changes in retinal practice of retinal specialists in the Philippines during the COVID-19 pandemic. A Google Form survey was done in May 2020, wherein the respondents were VRSP members and most reported performing only 1-25% of their usual number of VR procedures considering all types [21].

The other part of this study aimed to see if the drop in numbers would cause noncompliance with the VRSP recommendations and the result showed that this was true for the SR fellows in all types of procedure. For the MR fellows, the number of intraocular injections performed during the pandemic was still at par with the VRSP recommendations.



The Department of Ophthalmology and Visual Sciences extended all trainees for another year during the pandemic; the department had no graduates for 2020. The rationale was since training came to a halt and was later allowed on a limited degree for the trainees, the possible decrease in the number of procedures performed will cause them to have less experience. Looking at the combined number of procedures done by the fellows in 2020 and 2021, the result showed that this maneuver did not bring back the pre-pandemic numbers of all types of procedure. For the MR fellows, only the laser photocoagulation via slit lamp reached the pre-pandemic levels. However, the combined number of procedures of 2020 and 2021 allowed the MR fellows to comply with the VRSP standard. For the SR fellows, the scleral buckling procedures reached pre-pandemic numbers but none of the combined number of procedures reached the VRSP standards.

The COVID-19 pandemic resulted in a decrease in the number of Vitreo-Retinal procedures at the Philippine General Hospital. Despite extending the training period for another year, the pre-pandemic levels were mostly not reached. For the medical retina fellows, the extension allowed them to comply with the VRSP recommendations. This, however, was not the case for the SR fellows.

This study shows that extending the training period during the pandemic was not enough to ensure adequate training for the VR fellows. Other maneuvers or avenues of training have to be considered. It also suggests that other than the number of procedures, other ways of assessing competencies should be explored and studied. Modifications in the training program can be looked into to allow other forms of training such as simulations, remote live-assists, and use of AI for case findings.

This study is a document review and is limited by the data available in the logbooks. Descriptive statistics were used to determine the kind and number of procedures. Analysis of other variables was not done.

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