

# The Common Indications of Pars plana vitrectomy (PPV) for posterior Segment Ocular diseases in patients from a Private Retina Clinic in Lahore, Pakistan

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## ABSTRACT

**Purpose:** To evaluate common indications and anatomical outcomes of PPV for posterior segment ocular diseases in patients presenting at private retina clinic in Lahore

**Study design:** Cross sectional survey

**Methods and materials:** Over the period of three years, from 1<sup>st</sup> April 2017 to 30<sup>th</sup> April 2020, all patients fulfilling inclusion criterion, were included in study after approval from hospital ethical committee. After taking history and detailed ocular examination, diagnosis was confirmed by B scan or OCT, Hepatitis B & C screening done. The patient age, gender, laterality of eye, lens status, macular status, type of retinal pathology, type of anesthesia, procedure done and type of vitreous tamponade if used were noted. All procedures were performed by a single surgical team and patients were followed for six months for anatomical success or any complication. Data was analyzed by SPSS 25.

**Results:** Out of 266 total patients, 168 (63.2%) were males and 98 (36.8%) were females. Right eye was involved in 125 (47%) and left in 141 (53%). Age range was from 2 years to 83years, mean age for males was 47.30, for females 48.07 years, median age was 50 years, mean age for GA was 30.62 years and 51.71 for LA patients. The highest incidences of posterior segment ocular problems were observed in patients with age range 51 to 60 years. The commonest indication for posterior segment surgery were RRD seen in 107 (40.23%), ROSO in 51 (19.17%) and vitreous hemorrhage 33 (12.41%). Endophthalmitis was indication in 20 (7.52%), dropped nucleus in 11 (4.13%), Macular hole in 7 (2.63%) and ERM in 3 (1.13%). Asteroid hyalosis, intraocular IOFB and diagnostic vitrectomy were least common indication, each seen in 1 (0.5%) patient. Silicon oil was most commonly used Endo tamponade used in 138 (51.88%) patients. All patients were followed for 6 months with vision and retinal status. All patients who underwent pars plana vitrectomy surgery were stable with anatomical success rate till 6 months postoperatively except 10 (3.76%) who required re do operation for retinal detachment or some other complications.

**Conclusion:** Current practice in ophthalmology shows increased frequencies of internal approach (PPV) for vitreoretinal diseases rather external approach (SB). Silicon oil was most common internal tamponade used. Diabetic retinopathy was important cause of vitreous hemorrhage and TRD. Patients should be educated regarding regular fundoscopy and good systemic control of diabetes. Higher incidence of retinal detachment among all age groups needs awareness and education about its warning ocular symptoms.

**Key words:** PPV (Pars plana vitrectomy), RRD (Rhegmatogenous retinal detachment), SB (Scleral buckling), TRD (Tractional retinal detachment), ROSO (removal of silicon oil), GA (general anesthesia), LA (local anesthesia)

## INTRODUCTION

Pars plana vitrectomy was introduced in 1970 by Robert Machemer who first introduced pars plana vitrectomy (PPV) using a 17-gauge (17-G) cutter<sup>1</sup>. Since then it has become an indispensable tool for treatment of posterior segment retinal diseases demanding surgery. It is under constant modifications, upgradation and modernization till date. Although many variables determine final visual outcome after pars plana vitrectomy but it has revolutionized treatment modalities for retina as at least patient had chance to acquire good anatomical outcome with variable physiological denouements.

There are different vitrectomy systems used by different VR surgeons, like 20-gauge, 23-gauge, 25 gauge and 27

gauge, depending upon their skills, training institutes and instrument availability but transconjunctival suture less pars plana vitrectomy (TSV) with 23 G or 25 G has become a preferred choice<sup>2,3</sup>. It has certain advantages like small self-sealing incision, decreased post operative inflammation and pain, early recovery and less astigmatism<sup>4,5</sup>. Our study aims to share surgical experience of 266 patients performed by single VR team over three years from 2017 to 2020.

## MATERIALS AND METHODS

Over the period of three years, from April 2017 to April 2020, all 266 patients, who attended a vitreoretinal clinic having some posterior segment ocular disease, who need

a surgical management and fulfilled inclusion criterion, were included in study after approval from hospital ethical committee. Those patients who did not require surgeries and who lost follow up before completion of six months period were excluded. After detailed history and ocular examination, diagnosis was confirmed by B scan or OCT depending upon disease type. All patients were sent for Hepatitis B & C screening, irrespective of retinal pathology and type of anesthesia and additional tests like CBC, ECG or echocardiography were performed as advised by anesthetist depending upon patient physical fitness or mental status. The patients presenting in 2020, were also requested for PCR test for corona virus infection before ocular surgery. The patient age, gender, laterality of eye, lens status, type of RD, type of retinal pathology, type of anesthesia, procedure done and vitreous tamponade if used were noted. All procedures were performed by a single senior retinal surgeon using 23-gauge vitrectomy system. Three ports were created and kenacort was used to stain vitreous. The patients were followed for six months postoperatively for anatomical success or any complication. Anatomical success of retinal detachment surgery was defined as attached retina 6 months postoperatively. Data was analyzed by SPSS 25.

**RESULTS**

Out of 266 total patients, 168 (63.2%) were males and 98 (36.8%) were females. Right eye was involved in 125 (47%) and left in 141 (53%). Age range was from 2 years to 83years, mean age for males was 47.30, for females 48.07 years, median age was 50 years, mean age for GA was 30.62 years and 51.71 for LA patients. The highest incidences of posterior segment ocular problems were observed in patients with age range 51 to 60 years comprising of 63 (23.68%) patients, nearly one quarter of total patients. Most common indication for posterior segment surgery was RRD seen in 107 (40.23%), second was ROSO in 51 (19.17%) and third was vitreous hemorrhage 33 (12.41%). Endophthalmitis was indication for 20 (7.52%), tractional retinal detachment in 17 (6.39%),

dropped nucleus for 11 (4.13%), Macular hole in 7 (2.63%) and Epiretinal membrane in 3 (1.13%). Asteroid hyalosis, intraocular IOFB and diagnostic vitrectomy were least common indication, each seen in 1 (0.5%) patient. Silicon oil was most commonly used Endo tamponade used in 138 (51.88%), gas C3F8 or SF6 in 30 (11.28%), 47 (17.67%) left on fluid, remaining 51 (19.17%) were ROSO. All patients were followed for 6 months with vision and retinal status. All patients who had PPV and were stable with anatomical success till 6 months postoperatively were labelled as successful. Anatomical success was achieved in 256 (96.24%) except 10 (3.76%) who required re operation for re retinal detachment or some other complication within 6 months postoperatively.

Age Group Distribution

AGE GROUPS	TOTAL PATIENTS	% AGE
I-10	16	6.02%
11-20	13	4.89%
21-30	19	7.14%
31-40	39	14.66%
41-50	55	20.68%
51-60	63	23.68%
61-70	41	15.41%
ABOVE 70 YEARS	20	7.52%
Total	266	100%

Demographic Data

Mean Age	Male	47.30 years	63.20%
	Female	48.07 years	36.80%
Type of anesthesia	Local anesthesia	218	82%
	General anesthesia	48	18%
Laterality of eye	Right eye	125	47%
	Left eye	141	53%
Gender of patients	Male	168	63.2%
	Female	98	36.8%
Lens status	Phakic	117	44%
	Pseudophakia	126	47.40%
	Aphakic	23	8.60%

Indication of Retinal Disease

Sr. #	Indications of PPV	Male	Female	Total number of patients	Percentage
1	RRD	72	35	107	40.23%
2	ROSO	36	15	51	19.17%
3	VITREOUS HEMORRHAGE	22	11	33	12.41%
4	ENDOPHTHALMITIS	15	5	20	7.52%
5	TRD	5	12	17	6.39%
6	DROPPED NUCLEUS	5	6	11	4.13%
7	MACULAR HOLE	3	4	7	2.63%
8	COMBINED RRD & TRD	3	2	5	1.88%
9	ERM	1	2	3	1.13%
10	DROPPED IOL	1	1	2	0.75%
G k11	FUNNEL RD	1	1	2	0.75%
12	TRAUMA +IOFB	1	0	1	0.37%
13	RRD+DROPPED NUCLEUS	1	0	1	0.37%
14	TRD/ROP	0	1	1	0.37%
15	REDO RRD	1	0	1	0.37%
16	CHOROIDAL HEMANGIOMA	0	1	1	0.37%
17	ASTEROID HYALOSIS	0	1	1	0.37%
18	DIAGNOSTIC VITRECTOMY	0	1	1	0.37%
19	VMT	0	1	1	0.37%
	TOTAL	167	99	266	100%

## DISCUSSION

The pars plana vitrectomy (PPV) allows access to the posterior segment to treat vitreoretinal diseases. This procedure requires a great deal of technical skill and knowledge to ensure good post operative outcomes in term of vision and anatomical success. With recent advances in techniques of PPV, it is doing a great job in retaining, restoring of sight and prevention of blindness for patients of posterior segment diseases. Increasing number of posterior segment surgeries are being performed worldwide<sup>6,7</sup>.

There were more male patients than females. The ratio was around 63:37 (1.7:1). The increased prevalence of male patients presenting at a private set up can be related to more financial resources for them, men are main bread winners of family and there is male dominant social set up in Asia and less concerns of aging ladies for their visual requirements. Such distribution of patients is also in other studies done in Africa<sup>8</sup> (male to female ratio 2.4:1), India (1.2:1)<sup>9,10</sup>, Nigeria (3.4:1)<sup>11</sup>, Nepal (4.3:1)<sup>12</sup> and Korea (2:1)<sup>13</sup>.

Age group of patients from 51 to 60 years is most prominent among all patients, contributing to 23.68% (nearly one fourth of all patients) followed by 41 to 50 years (20.68%). Overall, 118 (45%) patients had age 41 to 60 years that is nearly half of total patients. It was obvious that most patients who underwent PPV were above 50 years of age<sup>14</sup>. Similar trends were also observed in other PPV based studies from Korea<sup>13</sup>, Africa<sup>8</sup> and USA<sup>15</sup> and India<sup>9,10</sup>. So not only the younger age group but also middle to old age patients were at risk of developing retinal detachments and pathologies.

Top four indications included RRD (40.23%)<sup>16,17</sup>, VH (12.41%)<sup>18,19</sup>, Endophthalmitis (7.52%)<sup>20</sup> and dropped nucleus (4.13%)<sup>13,21</sup>. Rhegmatogenous retinal detachment was more frequent than other indications for PPV. This is not only seen in studies in Pakistan but also comparative with data of patients undergoing PPV worldwide<sup>8,10,15</sup>. Most patients with RRD were pseudo phakic and above 55 years, whereas young age, myopia and trauma are mentioned as important causes of RRD in literature.

Diabetes and its related retinal complications requiring surgery is observed to be increased over last 20 years<sup>22</sup>. About 60% cases of non-resolving vitreous hemorrhage were known diabetic for more than 10 years with poor glycemic control. Some surgeons inject intravitreal Anti VEGF before PPV in every case of vitreous hemorrhage if no TRD seen on B scan, for better visual outcome but in our study, it was not practiced until neovascular component was found to be greater than fibrous component in proliferative retinopathy. Vitreous hemorrhage was top indication for PPV in studies from Nepal, Korea and India<sup>10,12,13</sup>.

Other least common indications were Asteroid hyalosis, diagnostic vitrectomy and VMT. Similar less frequent indications were also seen in studies from other parts of world<sup>8,9,13</sup>.

It seems that local anesthesia is increasingly preferred for PPV because the operation time is short, and greater patient convenience can be achieved<sup>23</sup>. More than 80% patients were operated under Local anesthesia (L/A) in our study. These factors may have contributed to the

increased vitrectomy rates as local anesthesia administration and recovery is easier than general anesthesia.

## CONCLUSION

Current practice in ophthalmology shows increased frequencies of internal approach for vitreoretinal diseases rather external approach. Silicon oil was most common internal tamponade used during vitrectomies. Diabetic retinopathy was important cause of vitreous hemorrhage and TRD. Patients should be educated regarding regular funduscopy and good systemic control of diabetes. Higher incidence of retinal detachment among all age groups needs awareness and education about its warning ocular symptoms.

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