

Indications and Visual Outcome of First Hundred Pars Plana Vitrectomies at Makkah Specialist Eye Hospital, Kano, Nigeria

Abdulsalam Shuaib, Abdul Fattah Memon¹

Department of Ophthalmology, Bayero University Kano/Aminu Kano Teaching Hospital, Kano State, Nigeria, ¹Vitreoretinal Unit, Al Ibrahim Eye Hospital, Isra Postgraduate Institute of Ophthalmology, Karachi, Pakistan

ABSTRACT

Objective: To review the indications and visual outcome of the first one hundred pars plana vitrectomies performed at the newly established surgical retina unit of Makkah Specialist Eye Hospital, Kano, Kano State, Nigeria. **Materials and Methods:** A retrospective chart review was performed. Data recorded from the patient chart include demography, pre and postoperative visual acuity, indication for surgery and associated systemic or ocular co-morbidities of first hundred consecutive patients, who underwent pars plana vitrectomy between March 2012 and January 2013. **Result:** One hundred eyes of 97 patients underwent pars plana vitrectomy including 75 (77%) males and 22 (23%) females with a mean age of 45.62 ± 16.1 years. Preoperatively, presenting visual acuity in the affected eye was $<3/60$ in 80 eyes (80%), while that in the contralateral eye was $<3/60$ in 24 eyes (24%). Postoperatively, 41 eyes (41%) had unaided visual acuity of $<3/60$. The most common indications for surgery were rhegmatogenous retinal detachment 49 eyes (51%) and vitreous hemorrhage 20 eyes (21%). **Conclusion:** Rhegmatogenous retinal detachment and vitreous hemorrhage are the major indications for pars plana vitrectomy in this environment. As vitreoretinal disorders have become more common in this part of the world, there would be a corresponding increase in demand for vitreoretinal services. There is therefore a need for more eye care providers with sub-specialty training in retinal diseases.

Keywords: Pars plana, retinal detachment, vision, vitrectomy

INTRODUCTION

The field of vitreoretinal surgery has undergone considerable evolution since 1962, when Kasner introduced the concept of removing the vitreous gel from the eye as a therapeutic modality.^[1] Dr Robert Machemer performed the first closed system vitrectomy in 1972, using a prototype instrument called the VISC (vitreous infusion cutter system).^[2] In 1974, Connor O'Malley proposed the three port vitrectomy, this led to a reduction in the size of the instruments and the incisions needed to insert them.^[3]

In developing countries, retinal diseases have had a low priority in blindness-prevention programs because it is assumed that they are not a common cause of blindness and the outcome of treating retinal diseases do not justify the effort and expense involved.^[4] The huge cost of equipment and shortage of trained manpower are also factors limiting the growth of this field of ophthalmology. Retinal diseases are likely to become more common in the developing world for a number of reasons. The prevalence of diabetes is projected to increase from 171 million in 2000 to about 366 million by the year 2030, with the greatest relative increase occurring in Sub-Saharan Africa, Middle East and India.^[5] The increase in number of cataract surgeries performed yearly, which is projected to hit 30 million by the year 2020, in order to meet the global initiative for elimination of avoidable blindness target,^[6] with most of this growth taking place in developing countries is also likely to lead to more posterior segment complications of cataract surgery. The increasing life expectancy in

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Address for correspondence

Dr. Abdulsalam Shuaib, Department of Ophthalmology, Bayero University Kano, Kano State, Nigeria. Email: seeshubby@yahoo.com

developing countries would likely lead to an increase in cases of posterior segment pathologies which are age related.

In Nigeria, reported percentage of patients seen in ophthalmic outpatients clinics with posterior segment disorders range from 3.9% to 13%.^[7,8]

Pars plana vitrectomy is not a commonly performed procedure in this environment, hence data on its indications and visual outcome not readily available. This study aims to identify the common indications and visual outcome associated with this procedure in our part of the world.

MATERIALS AND METHODS

This was a retrospective study conducted at the newly established surgical retina unit of Makkah Specialist Eye Hospital, Kano. A review of the case records of the first 100 consecutive patients who had pars plana vitrectomy between March 2012 and January 2013 was done. Demographic data, pre and postoperative visual acuity, indication for surgery, type of surgery and associated ocular or systemic conditions if any, were recorded.

Surgeries were performed using the DORC dual associate 2500 vitrectomy machine, while endolaser was with the Iridex IQ 532 green laser system. The unit converted from 20 to 23 gauge sutureless vitrectomy over the period of the study, hence the initial 78 were done using 20 gauge, while the last 22 cases were 23 gauge.

Data was analyzed using statistical pack for the social sciences (SPSS) version 16.

RESULTS

There were 100 eyes of 97 patients, including 75 males and 22 females with a male to female ratio of 3.4:1. The age ranged from 7 to 73 years with a mean age of 45.62 ± 16.1 years. The 51-60 years and 41-50 years ages group accounted for the highest percentage of patients. The age and gender distribution of patients is shown in Table 1. Pre and postoperative visual acuity is shown in Table 2.

The number of eyes with visual acuity of $<3/60$ reduced from 80 (80%) to 41 (41%) after surgery, while those with visual acuity of $\geq 6/18$ improved from 2 (2%) to 8 (8%).

About one quarter of patients had visual acuity $<3/60$ in the contralateral eye with less than half of them (45%)

having normal vision. Visual acuity in the contralateral eye is shown in Table 3.

Rhegmatogenous retinal detachment (RRD) was the major indication for surgery, followed by vitreous hemorrhage and tractional retinal detachment. The main indications for pars plana vitrectomy is shown in Table 4. The types of surgical procedures are shown in Table 5. Fifty-seven percent of eyes had pars plana vitrectomy, endolaser and silicon oil tamponade. The associated systemic and ocular conditions of reviewed patients are shown in Table 6. Twenty-two (22.7%) were diabetic, 7 (7.2%) were hypertensive, while 26 (26.8%) of patients had no associated systemic or ocular conditions.

DISCUSSION

This study reports the major indications and visual outcome of pars plana vitrectomy in the first one

Table 1: Age and sex distribution of patients

Age group (years)	Gender		Total (n)	Percentage
	Male	Female		
0-10	1	1	2	2
11-20	6	0	6	6.2
21-30	8	4	12	12.4
31-40	13	3	16	16.5
41-50	16	5	21	21.7
51-60	19	7	26	26.8
61-70	9	2	11	11.3
71-80	3	0	3	3.1
Total	75	22	97	100

Table 2: Pre operative and post operative visual acuity (eyes)

Visual acuity	Pre operative		Post operative	
	Frequency	Percentage	Frequency	Percentage
NPL	0	0	2	2
PL	19	19	9	9
HM - $<3/60$	61	61	30	30
3/60 - $<6/60$	14	14	32	32
6/60 - $<6/18$	4	4	19	19
6/18 - 6/6	2	2	8	8
Total	100	100	100	100

NPL: No Perception of Light; PL: Perception of light

Table 3: Visual acuity in contralateral eye

Visual acuity	Frequency	Percentage
NPL	6	6.2
PL	3	3.1
HM - $<3/60$	15	15.5
3/60 - $<6/60$	11	11.3
6/60 - $<6/18$	17	17.5
6/18 - 6/6	45	46.4
Total	97	100

NPL: No Perception of Light; PL: Perception of light

Table 4: Main indication for surgery

Indication for surgery	Frequency	Percentage
Regmatogenous retinal detachment	51	51
Vitreous hemorrhage	21	21
Tractional retinal detachment	10	10
Dislocated lens	4	4
Macula hole	3	3
Removal of silicon oil	2	2
Others	8	8
Total	100	100

Table 5: Type of surgical procedure

Surgical procedure	Frequency	Percentage
PPV+EL+SO	57	57
Phaco+PPV+EL+SO	23	23
PPV+EL	9	9
PPV+ILM peeling+EL+SO	3	3
PPV	3	3
PPV+PPL+EL+SO	2	2
PPV+Lens extraction+	1	1
Scleral fixated PCIOL		
SO removal	2	2
Total	100	100

PPV: Pars plana vitrectomy, EL: Endolaser, SO: Silicon oil, ILM: Internal limiting membrane, PPL: Pars plana lensectomy

Table 6: Associated systemic and ocular conditions

Associated condition	Frequency	Percentage
Diabetes mellitus	22	22.7
Diabetes and hypertension	7	7.2
Hypertension	3	3.1
Trauma	17	17.5
Pseudophakia	10	10.3
High myopia	4	4.1
Sickle cell disease	3	3.1
Uveitis	3	3.1
Marfans syndrome	1	1
Aphakia	1	1
Nil	26	26.8
Total	97	100

hundred patients in a newly established surgical retina unit. The mean age among patients in this study (45.62 years) was similar to that reported by Oderinlo *et al.*^[9] (46.1 yrs) in patients undergoing surgery for retinal detachment in Nigeria. Two studies in Nepal^[10,11] and another in Brazil^[12] reported 46.3, 41.75 and 50.4 years, respectively, but these are less than values in the United States^[13] and Israel^[14] where mean ages were 63 and 70.1 years, respectively. The longer life expectancy in the US and Israel compared to these other countries could have accounted for this finding. The male to female ratio of 3.4:1 was close to that seen in a Nigerian study^[9] (3.5:1), while that in Nepal^[10] was 2.5:1 and Brazil^[12] 1.9:1, in US and Israel values were 1:1 and 1:1.8, respectively.

The percentage of eyes with preoperative visual acuity <3/60 (80%) at presentation was in agreement with what obtained in Nigeria^[9] (79.6%) and Nepal^[10] (92%), while postoperatively the percentage of eyes with such vision (39%) was lower than that reported by Oderinlo *et al.* (49.5%) but higher than in Nepal (21%). The leading indication for surgery in this study was similar to that in Nepal^[10] and Brazil,^[12] where RRD accounted for 75% and 46.3% of surgeries, respectively. In the USA^[13] epiretinal membrane (39.1%) was leading indication for surgery, while in other studies in Nepal^[11] and Israel^[14] vitreous hemorrhage accounted for the highest percentage accounting for 53.13% and 71.4%, respectively. The second leading indication for surgery was similar in most of the studies with vitreous hemorrhage accounting for 18.5% in the USA,^[13] 19% in Nepal,^[10] and 22.5% in Brazil.^[12] In Israel^[14] RRD and macula hole came joint second with each accounting for 11.9% of cases, while in another study in Nepal,^[11] endophthalmitis was the second most common indication for surgery (12.5%). More than half of the eyes operated (57%) underwent pars plana vitrectomy, endolaser and injection of silicon oil, about a quarter of eyes (23%) had phacoemulsification in addition to PPV while 9 eyes (9%) had PPV and endolaser only. Three eyes had internal limiting membrane peeling in addition to PPV, while 2 eyes in a patient with marfans syndrome had pars plana lensectomy.

The percentage of patients that were diabetic (30%) and hypertensive (10%) in this study was much lower than that recorded in Israel,^[14] where 69.1% of patients were diabetic and 71.4% hypertensive. There was a history of trauma in 17.5% of cases that had surgery in this study with an average age of about 23 years, in Nepal,^[11] trauma was associated with 23.4% of cases.

Postoperatively, unaided visual acuity measured at 6 weeks follow up improved in 69 eyes (69%), remained the same in 13 eyes (13%) and decreased in 18 eyes (18%). These values were similar to what was obtained in a Nigerian^[9] study, where vision improved in 59.2%, no change in 27.5% and worsened in 13.7% in patients that underwent surgery for RRD at 2 months postoperative follow up, though only about 75% of patients in this study had PPV alone with an additional 11% having scleral buckle in addition to PPV. A study in Turkey^[15] also recorded similar findings with improvement in post-operative BCVA in 75.4%, no change in 11.3% and a decrease in 13.2% of cases at 12 months, while a similar study in India^[16] reported 78%, 16% and 6%, respectively at 6 weeks. Considering the fact that most of the eyes in this study had silicon oil tamponade (85%), BCVA would probably have resulted in a better visual outcome as it is known that silicon oil induces hypermetropic

shift by an average of + 5.07 to + 7.6 D in phakic eyes,^[17-19] a mean of + 5.69 D in pseudo-phakic eyes^[20] and a mean myopic shift of -6.63 to -6.67 D in aphakic^[17,19] eyes, but this information was not available in many of the records reviewed. The major limitation of this study was its retrospective nature but nevertheless most of its results are in keeping with findings from similar studies in other parts of the world.^[9-16]

CONCLUSION

Regmatogenous retinal detachment and vitreous hemorrhage were the most frequent indications for pars plana vitrectomy and this procedure was associated with improvement in postoperative visual acuity in majority of patients. There is a growing need to give retinal disorders the priority attention it deserves in blindness prevention programs in developing countries. This requires concerted efforts by stakeholders to ensure eye care workers are positioned to meet, not only the present but also future challenges in eye care. There is therefore a need for more ophthalmologists with sub-specialty training in retinal diseases in order to meet the need for patient care and manpower development.

REFERENCES

1. Kasner D. A new approach to the management of the vitreous. *High Ophthalmol* 1969;11:304.
2. Machemer R, Buttner H, Norton EW. Vitrectomy: A pars plana approach. *Trans Am Acad Ophthalmol Otolaryngol* 1971;75:813-20.
3. O'Malley C, Haintz RM. Vitrectomy with an alternative instrument system. *Am Ophthalmol* 1975;7:585-8.
4. Yorston D. Retinal Diseases and VISION 2020. *Community Eye Health J* 2003;16:19-20.
5. Sarah W, Gojka R, Anders G, Richard S, Hilary K. Global Prevalence of Diabetes: Estimates for the year 2000 and projections for 2030. *Diabetes Care* 2004;27:1047-53.
6. World Health Organization (WHO) Programme for the prevention of blindness and deafness. Global Initiative for Elimination of Avoidable Blindness. WHO/PBL/2000; 97.61Rev. 2.
7. Boniface IE, Judith NU, Jude S. The burden and spectrum of vitreoretinal diseases among ophthalmic outpatients in a resource deficient tertiary eye care setting in south eastern Nigeria. *Middle East Afr J Ophthalmol* 2010;17:246-9.
8. Oluwatoyin HO, Samuel OO, Iyiade AA. Retinal diseases in a tertiary hospital: The need for establishment of a vitreoretinal care unit. *J Natl Med Assoc* 2008;11:1286-9.
9. Oderinlo O, Hassan AO, Okonkwo ON, Oluyadi FO, Ogunro AO, Ulaikere M. Factors influencing visual outcome after surgery for retinal detachment. *Niger J Ophthalmol* 2012;20:24-9.
10. Paudyal G, Doshi V, Shrestha MK, Kalayoglu MV, Tabin G, Gurung R, *et al.* Treatment of vitreoretinal disorders in the developing world: Indications and outcome of vitreoretinal surgery in Nepal. *Ophthalmology* 2005;112:319-26.
11. Subedi S, Sharma MK, Sharma BR, Kansakar I, Dhakwa K, Adhikari RK. Surgical outcome of pars plana vitrectomy: Retrospective study in a peripheral tertiary eye care centre in Nepal. *Nepal J Ophthalmol* 2010;2:39-44.
12. Nobrega MJ, Casagandre C, Nunes RP, Nagel G. Indications for pars plana vitrectomy in a tertiary healthcare service in southern Brazil. *Invest Ophthalmol Vis Sci* 2004;45:2007.
13. Gupta OP, Ho AC, Kaiser PK, Regillo CD, Chen S, Dyer DS, *et al.* Short term outcomes of 23 – gauge pars plana vitrectomy. *Am J Ophthalmol* 2008;146:193-7.
14. Ayala P, Gennady L, Guy K, Haya K, David H, Amir B. Results of combined surgery by phacoemulsification and vitrectomy. *Isr Med Assoc J* 2004;6:143-6.
15. Citirik M, Batman C, Bicer T, Akinci A. Long term outcomes of 23 gauge transconjunctival suture less vitrectomy. *Turk J Med Sci* 2011;41:1021-8.
16. Biju JC, Apuca SM. 23 Gauge transconjunctival vitrectomy: Short term visual outcome and complications. *Int J Recent Trends Sci Technol* 2014;10:45-50.
17. Pavlovic S, Tomic Z, Latinovic S. Changes in ocular refraction after tamponade with silicon oil. *Med Pregl* 1996;49:181-3.
18. Smith RC, Smith GT, Wong D. Refractive changes in silicon filled eyes. *Eye (Lond)* 1990;4:230-4.
19. Man-Soeng S, Sun-Taek L, Hyun-Dong K, Byeong-II P. Changes in refraction and axial length according to the viscosity of intraocular silicon oil. *Korean J Ophthalmol* 1999;13:25-9.
20. Hotta K, Sugitani A. refractive changes in silicon oil-filled pseudophakic eyes. *Retina* 2005;25:167-70.

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