ORIGINAL ARTICLE

VITRECTOMY IS SUCCESSFUL IN RESTORING EYE SIGHT: AN INTERVENTIONAL STUDY IN TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction: Pars planavitrectomy is the final step in management of many disease. Taking into consideration usefulness and necessity of Pars planavitrectomy in today's world we would like to do this study to evaluate the surgical outcome of 20 gauge pars planavitreoretinal surgery.

Methodology: A hospital-based prospective interventional study of series of 46 patients was carried out in retina clinic of SMIMER, Surat, Gujarat, From July 2012 to November 2014 who underwent vitreoretina surgeries were reviewed. Demography, duration of symptoms, risk factors and indications, preoperative and post-operative visual acuity, intra-operative and post-operative complications were analyzed.

Results: Of 46 patients, preoperatively, 89 % had visual acuity of 2/60 to perception of light .The main indication for TPPV was nuclear drop, in 50 %.The visual acuity improved to better than 6/60 in 57% patients , whereas, overall, in 86.9 % of the subjects, it improved by 1 lines postoperatively. The commonest intra-operative complications was bleeding intraocularly(4.35%).

Conclusion: Useful vision can be restored by pars planavitrectomy in the majority of the patients (p value <0.01). Timing of vitrectomy did not have influence on visual outcome in patients of nuclear drop. Progression of cataract is the commonest complication of TPPV(10.87%). Indications of vitrectomy does not have statistically significant influence on visual outcome after vitrectomy.

Keywords: Vitrectomy, Snellen's chart, Intraocular Pressure

INTRODUCTION

Present human knowledge is sum of many original finding, generally emerging from curiosity and perseverance of a single person, with a substantial contribution made by chance. In 1971, Machemer performed the first closed, pars plana, vitrectomy [1].The instrument for performing the vitrectomy was a single probe called *VISC*(vitreous-infusion-suction-cutting) as this large, bulky probe performed all functions.The next giant step was the separation of the various functions of the single probe into separate probes for aspiration-cutting, illumination, and infusion. [2] This ingenious use of a separate infusion line allowed miniaturization and standardization of the size of the various vitrectomy instruments needed for surgery. Conditions requiring Pars planavitrectomy are vitreous hemorrhage, removal of dropped nucleus or intraocular lens in vitreous cavity, endopthalmitis, intraocular foreign body removal, proliferative retinopathy with tractional detachment, etc. Complication resulting in vitrectomy surgery are Cataract, the most common complication, Retinal tear, Retinal detachment, Suprachoroidalhemorrhage, etc.

Offering basic ophthalmic care in resource limited setting is difficult, and providing advanced surgical eye treatment is a great challenge. International ophthalmology therefore has traditionally focussed efforts on addressing preventable forms of blindness such as cataracts and nutritional deficiency[3]. In turn, relatively few researchers have examined ways to offer advanced eye care in developing world. A study conducted in an urban area in India estimated that the top 3 causes of blindness were cataract (29.7%), retinal disease (12.5%), and corneal disease (15.4%), and concluded that policy

makers should develop a comprehensive long term policy on blindness inaddition to efforts focused on cataract.[4]

The first goal of vitrectomy is to restore and probably enhance vision. Pars planavitrectomy is the final step in management of many disease. Taking into consideration usefulness and necessity of Pars planavitrectomy in today's world we would like to do this study to understand the benefits and complications of surgery as well as it's need in basic tertiary care center with 20 gauge vitrectomy.

METHODOLOGY

A hospital-based prospective study of series of 46 cases was carried out in retina clinic of SMIMER, Surat, Gujarat, From July 2012 to November 2014 who underwent vitreo-retina surgeries were reviewed after ethical committee clearance and consent from patients. 18 years or older patients, without previous history of vitreoretinal surgery were included in study. Patient's demographic details, history and duration of presenting illness, history of previous ocular or systemic illness were recorded. Visual acuity was measured by using Snellen's chart and intraocular pressure was measured by non contact tonometer. Slit lamp biomicroscopy was carried out for examination of anterior and posterior segment. Ultrasonography in patients with hazy media was carried out. Investigations like Rbs and Blood pressure were taken on OPD basis. HIV and HbsAg were done as a part of universal precautions in OT.

The operations were performed under local or general anesthesia. Following limbalperitomy an infusion cannula is secured to the sclera (3.5 mm behind the limbus in pseudophakic or aphakic eyes and 4 mm in phakic eyes) at the level of the inferior border of the lateral rectus muscle. Further sclerotomies are made at the 10 and 2 o'clock positions. These can be standard stab incisions made with an 20 gauge MVR blade parallel to limbus.

The cutter and fibreoptic light pipe enter through the upper two sclerotomies. The central vitreous gel and posterior hyaloid face are cut with cut rate of more than 1000-1500/min and vaccume ranges from 150-200 mmHg. After completing the vitrectomy, panretinal photocoagulation was performed in indicated patients. Balanced saline solution was used as the infusion fluid . Air, expansile gas, or silicone oil (1000 centistokes, 5000 centistokes) was used as endotamponade when necessary; Peripheral iridectomy at the 6 o'clock position was performed in aphakic eyes before silicone oil tamponade.IOL was implanted in sulcus or patient kept aphakic according to capsular supportin patient of nucleus drop. The peripheral fundus was then examined under scleral depression to search for possible iatrogenic retinal breaks. In order to prevent postoperative leakage and postoperative hypotony all the sclerotomy and peritomy were sutured with vikryl 7-0. Subconjunctival antibiotics and steroid injections were administered at the end of surgery. Post Vitrectomy all patients were given Oral antibiotics drugs for 5 days, Oral non-steroidal anti-inflammatory drugs for 5 days and Topical antibiotic eyedrops (gatiflox) , steroid eyedrops (prednisolone) and cycloplegic(atropine) are given for on and half months.

All patients are advised for follow up on 1st day, 1st week, 1st month, 3rd month with best corrected visual acuityon Snellen's chart for distant vision, Slit lamp examination, Tonometry using Non contact tonometer, Fundus examination with direct and indirect ophthalmoscopy (+20D), Fundus examination with slit lamp biomicroscopy (+78D/+90D) and Indirect ophthalmoscopy with scleral indentation after one month to rule out break or tear.

X^2 , t test, fisher exact test is used for analysis of result. $P \leq 0.05$ was considered statistically significant. Software used was SPSS and Microsoft excel.

RESULTS

Total 66 patients were analysed over three years period but 8 patients were excluded from study as adults more than 18 years were included in study, 2 patients refused to give consent ,10 patients did not turn for followup due to various reasons like non availability of caretaker, lack of money, death etc.

Table 1: Age and gender wise Distribution of the subjects

Factors	Patients (n=46) (%)
Age of patients	
<40 years	5 (10.8)
40-60 years	24(52.1)
>60 years	17(36.9)
Gender	
Male	24 (52.2)
Female	22 (47.8)

Majority of subject (52%) in present study belong to age group of 40-60 years of age.

Thus there was not much difference between male and female population

Table 2: Distribution of study population as per the pre-existing ocular and systemic disease

Disease	Frequency (%)
Hypertension	16 (34.8)
Diabetes mellitus	12 (26.1)
Glaucoma	7 (15.2)
Cystoid macular oedema	5 (10.9)
Other	2 (4.4)

Others : tuberculosis and asthma patients

Table 3: Indication of vitrectomy

Indications	Male (n=24) (%)	Female (n=22) (%)	Frequency (%)
Vitreous hemorrhage	4 (8.6)	6 (13)	10 (21.7)
Proliferative retinopathy	1 (2.1)	1 (2.1)	2 (4.3)
Dislocated intraocular lens	3 (6.5)	0	3 (6.5)
Dislocated lens (natural)	11 (29.9)	10 (21.7)	21 (45.6)
Retinal detachment	0	1 (2.2)	1 (2.2)
Trauma	4 (8.6)	2 (4.3)	6 (13.0)
Endopthalmitis	1 (2.1)	2 (4.3)	3 (6.5)

Most common indication for vitrectomy at our set up in our study is dislocated lens(nuclear drop) followed by vitreous hemorrhage .

Table 4: preoperative best corrected visual acuity

Preop BCVA	Frequency(%)
PL to 2mfc	41(89.1)
3mfc to 6\60	3(6.5)
>6\60	2(4.3)

Majority of patients indicated for vitrectomy had poor preoperative visual acuity.

Table 5: Intraoperative complication during vitrectomy surgery

Complication	No of patients (%)
Bleeding	2 (4.35)
Corneal erosion	1 (2.17)

Most common intraoperative complication was intraocular bleeding

Our result shows that a improvement in visual outcome (p value <0.01) is observed at 3 month

Functional success was defined as improvement in one or more line of visual acuity on snellen chart which was 86.95% while anatomical success rate was 93.47% with clearing of media with vitrectomy

Table 6: Trend of change of vision from preoperative vision to postoperative Vision

BCBCVA	Preop	% Preop	Day 1	% Day 1 postop	1 wk	% Postop 1wk	4 wk	% Postop 4wk	3 month	% Postop 3 month
PL to 2mfc	41	89.13	38	82.61	26	56.52	13	28.26	8	17.39
3mfc to 6\60	3	6.52	8	17.39	13	28.26	13	28.26	12	26.09
>6\60	2	4.35	0	0.00	7	15.22	20	43.48	26	56.52

Table 7: Preoperative & Postoperative comparison of visual acuity of patients with nuclear drop

Variable	Preoperative (%)	Postoperative (%)
PL to 2mfc	19(41.3)	2(4.3)
3mfc to 6/60	2(4.3)	2(4.3)
>6/60	2(4.3)	19(41.3)

Risk ratio was 8.82 ,this shows that good vision patients in nuclear drop patients were eight time more in patients undergoing vitrectomy.

Table 8: Difference in outcome of patients with duration of nuclear drop

Duration of nucleus drop	BCVA <6/60	BCVA >6/60
<2 month	3	6
>2month	2	12

P value=0.339

Timing of vitrectomy does not have any influence on postoperative visual outcome (P value >0.05) in patients with nuclear drop.

Table 9: Postoperative complication rate

Complication Post Operative	No of patients (%)
Cataract Progression	5 (10.9)
Vitreous Hemorrhage	2 (4.35)
Glaucoma	3 (6.52)
Cystoid Macular Oedema	2 (4.35)

Most common complication at 3 month postoperative period in our study . Cataract progression were mostly nuclear in nature and were observed after 3 weeks of vitrectomy

DISCUSSION

Majority of population was more than 40 years indicating growing need of vitrectomy with advancement of age. This finding is consistant with a study from Nepal conducted in2010.[5]

In present study Male and female ratio is equal while in a study from Nepal[5] showed more male underwent vitrectomy compared to female which might be due male predominant society and less preference to womens health.

In a study in sub saharaAfrica[6] in 2013, showed that Forty nine [75%] eyes were blind [visual acuity of < 3/60] before vitrectomy,while in our study it was 89% due to less availability of vitrectomy setup which is operating at low cost, forcing many patients for spontaneous resolution or blindness arising from conditions, creating a condition to be looked by government as growing need to improve this part of health sector .

Bleeding was observed intraoperatively from fibrovascular band of neovasularization in diabetic retinopathy while epithilieal defect occuredintraoperatively accidentally in diabetic patient secondary to loss of corneal sensitivity

In a study in Nepal[5] in 2005 showed that the visual acuity improved to better than 6/60 in patients with VH (68 %), whereas, overall, in 72 % of the subjects, it improved by 2 lines postoperatively; this was consistent with our finding of 57%(RR 9.6).

In our study postoperative visual acuity(82%) as compared to preoperative visual acuity (8.69%) in group of vision >6/60 [p value <0.01].while In a study in Philadelphia[7] in 1994 showed that Visual acuity after vitrectomy for retained lens fragments was 20/40 or better in 82 eyes (68 percent), this difference was observed due to better endpoint result acuity considered in that study. In a study in Miami[8] in 1994 showed that the timing of vitrectomy in a case of nucleus drop did not influence visual acuity outcomes which is similar to finding in our study.

Similar findings of nuclear sclerosis was seen In a study in Baltimore[9] in 1988 showed that Glaser BM Kaplan-Meier life table analysis performed on 53 eyes with examination of fellow eyes and longer follow-up showed significantly more nuclear sclerosis in the operated on eye when compared to the fellow eye (log-rank test, P less than .0001)

CONCLUSION

The study was conducted in the department of Ophthalmology, SMIMER, Surat over a period of 3 years from September 2012 to November 2014, in which 46 eyes of 46 patients were examined preoperatively

Most common indication for vitrectomy was nuclear drop as our center is a tertiary level referral center. Other common indication was vitreous hemorrhage. Majority (89%) of preoperative visual acuity was having poor visual acuity (in range of perception of light to 2 meter finger count). We define functional success as improvement in one or more line of visual acuity which was 86.95% while anatomical success as clearing of media with no need for further surgery was 93.4%. Progression of cataract was most common postoperative complication Significant improvement (p value <0.01) in vision postoperatively after 20 gauge vitrectomy was observed, with majority of patients (57%) having vision >6/60. Good vision patients were nine time more in patients undergoing vitrectomy (RR 9.6).

Thus we conclude that VR surgery is undertaken for a wide range of conditions, but a small number of diagnoses encompass the majority of cases. Useful vision can be restored by pars planavitrectomy in the majority of the patients. Timing of vitrectomy did not have influence on visual outcome in patients of nuclear drop. Thus vitrectomy should be an integral part of eye care and its availability should be made a priority in ophthalmic facilities

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