

Outcomes after 23G trans-conjunctival parsplana vitrectomy and suturing of sclerotomy using 10/0 Nylon in patients with diabetic retinopathy in private hospital of Sargodha

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Abstract

Objective: To determine astigmatic and intraocular pressure changes after 23G transconjunctival parsplana vitrectomy in diabetic retinopathy cases with the use of temporary 10/0 nylon suture to sclerotomy site.

Methods: The prospective experimental study was conducted during 2018 at Zaheer Laser Eye Centre, Sargodha, Pakistan, and comprised patients with confirmed diagnosis of diabetic retinopathy. Post-surgery, 10/0 nylon suture was removed on 1st postoperative day and astigmatism and intraocular pressure were measured on day, at 1 week, 1 month and 3 months. Data was analysed using SPSS 19.

Results: Of the 120 patients, 60(50%) each were women and men. The overall mean age was 54.01 ± 13.81 years. Mean intraocular pressure before surgery was 19.98 ± 3.19 mmHg, and 3 months after the surgery it was 19.98 ± 1.89 mmHg. Mean corneal astigmatic reading before surgery was 1.25 ± 0.85 and after 3 months post-surgery, it was 1.42 ± 0.71 . The mean values remained statistically non-significant across all the follow-up points ($p > 0.05$).

Conclusion: Astigmatism and intraocular pressure changed non-significantly after 23G trans-conjunctival parsplana vitrectomy and temporary suturing of sclerotomies using 10/0 nylon.

Keywords: Diabetic retinopathy, Pars plana vitrectomy, Astigmatism. (JPMA 70: 1390; 2020).

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Introduction

Diabetic retinopathy (DR) is still one of the preventable causes of blindness throughout the world, especially for the 25-75 years age group. The retinal fibrovascular proliferation advocates a vital risk of loss of vision in patients with diabetes.¹ A few factors that increase the prevalence of diabetic eye disease include its duration, poor glycaemic control and hypertension with dramatic effect on the progress and onset of retinopathy.² Visual loss from diabetic eye disease happens via two pathways: retinal ischaemia and leakage, and retinal neovessel formation, described as advanced or proliferative diabetic retinopathy, and resulting in excessive loss of vision. The basic pathology of retinopathy in diabetes is the ongoing ischaemia following damage to micro retinal vessels. The main complications responsible for decrease in vision are macular oedema and ischaemia, tractional detachment, epiretinal membrane formation, and vitreal haemorrhage.³

The surgical management for advanced diabetic eye disease, that is pars plana vitrectomy (PPV), consists of removal of the vitreous body and tractional membranes.⁴⁻⁷ Current indications for PPV in patients with diabetic retinopathy include tractional retinal detachment (TRD), vitreal haemorrhage, resistant diabetic macular oedema, combined tractional and rhegmatogenous detachment (CTRRD) associated with posterior hyaloidal traction, epiretinal membrane (ERM) formation and anterior segment neovascularisation with media opacities.⁸ Postoperative wound leakage in sutureless vitrectomy could develop into serious complications such as hypotony maculopathy, ocular inflammation, cavity bleed, vitreous incarceration, choroidal detachment and suprachoroidal fluid.

A study reported that surgically-induced astigmatism was 0.38 ± 0.75 at 1 week, 0.28 ± 0.68 at 2 weeks, 0.06 ± 0.35 at 1 month, 0.04 ± 0.40 at 2 months and 0.06 ± 0.42 at 3 months. The 23G vitrectomy technique was considered secure and efficacious in the domain of vitreoretinal diseases.⁹

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The current study was planned to determine surgically-induced astigmatism changes and intraocular pressure (IOP) after 23G transconjunctival pars plana vitrectomy with placement of 10/0 nylon suture to sclerotomy sites in DR cases.

Patients and Methods

The prospective experimental non-randomised study was conducted during 2018 at Zaheer Laser Eye Centre, Sargodha, Pakistan, and comprised confirmed DR patients aged >20 years of either gender. All cases of retinal vein occlusion, history of haemodialysis (HD), history of vitrectomy, glaucomatous cases, keratoconus, history of previous ocular surgery and all pregnant females were excluded.

Approval from hospital ethical board was also taken headed by Dr. Zaheer Ahmed.

The sample size was calculated using mean changes in IOP values (i.e. mean IOP pressure 10.81 ± 4.03 mmHg pre-operative and 15.94 ± 2.9 mmHg post-operatively) reported previously at 90% power of test and $\alpha = 5\%$.¹⁰ The calculated sample size for this study was 20 patients. We took 120 patients in this study.

After informed consent, a comprehensive ophthalmic examination of each patient was done. A 0.72mm broad 23G stiletto blade was inserted at an angle of 5-15 degrees via the conjunctiva, sclera and planar part approximately 3.5mm from the limbus (Accurus; Alcon Surgical). Pneumatic cutter was used.

Transient wound leakage occurred frequently in the period immediately after removal of the instruments and infusion cannula. Wound leakage was arrested by applying gentle massage over the outside aspect of scleral tunnel wound for a bit, followed by closure of incision with the help of 10-0 nylon sutures, and the knots were buried. The sutures were released within 24 hours of surgery by pulling gently with forceps under topical anaesthesia and slit lamp illumination.

Astigmatism and IOP were measured at baseline, at 1 week, 1 month and 3 months. IOP was measured using applanation tonometry. Astigmatism was measured using Keratometry.

SPSS 19 was used for data analysis. Quantitative variables were presented as mean $\pm$ standard deviation (SD) along with minimum and maximum values. Repeated measure analysis of variance (ANOVA) was used to determine

Table: Data of Baseline and Post-Operative Study Outcomes.

	Mean $\pm$ SD	Min.	Max.	p-value
IOP before surgery (mmHg)	19.98 $\pm$ 3.19	12	28	0.073
IOP at 1 day	18.38 $\pm$ 2.54	15	26	
IOP 1 week	18.45 $\pm$ 2.42	14	26	
IOP 1 month	19.88 $\pm$ 1.89	15	26	
IOP 3 months	19.98 $\pm$ 1.89	15	26	
Corneal Astigmatism before surgery	1.25 $\pm$ 0.85	0	3.50	0.408
Corneal Astigmatism after 1 day	1.75 $\pm$ 0.74	0.40	3.75	
Corneal Astigmatism 1 week	1.57 $\pm$ 0.63	0.50	3.50	
Corneal Astigmatism 1 month	1.51 $\pm$ 0.66	0.70	3.40	
Corneal Astigmatism 3 months	1.42 $\pm$ 0.71	0.50	3.50	

IOP: Intraocular pressure.

clinically significant changes in IOP and astigmatism from the baseline value and at different time intervals during the follow-up period.

Results

Of the 120 patients, 60(50%) each were women and men. The overall mean age was 54.01 ± 13.81 years (range: 27-77 years). Mean IOP at baseline was 19.98 ± 3.19 mmHg, and at 3-month follow-up after the surgery it was 19.98 ± 1.89 mmHg. Mean corneal astigmatic reading at baseline was 1.25 ± 0.85 and at 3-month post-surgery follow-up, it was 1.42 ± 0.71 . The mean values remained statistically non-significant across all the follow-up points (Table).

Discussion

The study found that the change in mean IOP value remained statistically non-significant. An earlier also reported similar finding.¹¹

One study compared 23G and 25G transconjunctival sutureless vitrectomy in subjects with proliferative DR, and reported that visual acuity (VA) had markedly improved following surgery in both groups ($p \geq 0.0001$) though there had been no significant differences in VA outcome between the two ($p=0.43$). The patients in 23G arm had IOP <6mmHg ($p=0.034$) on day 1, and significantly more patients were required to undergo a sclerostomy suture postoperatively ($p=0.014$).¹²

Another study reported postoperative complications like corneal epithelial defects, anterior chamber activity, hyphaema, posterior synechia, vitreal haemorrhage, retinal breaks, retinal detachment, and neovascular glaucoma (NVG).¹³ This may have resulted because of loss of tamponade and ocular hypotony due to leaking sclerotomy in small gauge vitrectomy.

A study used 23G needle PPV without sutures, and found significant reduction in IOP on first post-op day after vitrectomy ($p < 0.01$).¹⁰

Another study used 8.0 (Vicryl) suture for incision closure after 23G vitrectomy, and compared post-op pain and scleral inflammation in patients, concluding that the use of sutures after 23G PPV was beneficial for preventing complications.¹⁴

The current study additionally evaluated mean astigmatism of cornea and the change in mean value remained statistically non-significant across different follow-up points ($p > 0.05$).

Further researches are needed to compare 23G transconjunctival vitrectomy with PPV in indications other than DR.

Conclusion

Changes in mean astigmatism and IOP were non-significant after 23G transconjunctival pars plana vitrectomy and temporary suturing of sclerotomies using 10/0 nylon.

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Conflict of Interest: None.

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