SHORT REPORT

Frequency of post-operative hypotony after 23-gauge transconjunctival vitrectomy with locally made instruments

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Abstract

The objective of this study was to discern the frequency of post-operative hypotony after 23-gauge vitrectomy with locally made instruments. This study was conducted at the Department of Ophthalmology, Lahore General Hospital, Lahore from July 2012 to June 2016. A total of 300 patients underwent 23-gauge pars-plana vitrectomy. Locally made 23-gauge trocar cannula system was used in all the patients. Post-operative Intraocular Pressure (IOP) was measured using Goldman Applanation Tonometer on the first post-operative day. IOP of less than 06mmHg was termed as hypotonic. In our study, mean post-operative intraocular pressure was recorded as 8.32±3.04mmHg and frequency of post-operative hypotony after 23-guage vitrectomy with locally made instruments reveals 10.67% (n=32) while 89.33% (n=268) had no findings of hypotony. We concluded that the frequency of post-operative hypotony after 23-gauge vitrectomy with locally made instruments is slightly higher when compared with other studies and this instrument can be used for further surgeries.

Keywords: 23-gauge vitrectomy, Locally made instruments, Post-operative hypotony, Frequency

Introduction

Hypotony is defined as an Intraocular Pressure (IOP) of up to 6 mmHg.[1] It occurs when aqueous humor production does not keep pace with the out-flow, which may be greater in many conditions and post-operative wound leak would be one of them. It may also be associated with papilloedema, vascular tortuosity, chorioretinal folds and maculopathy.[2] One advantage of 23-gauge transconjunctival vitrectomy is a shorter period of operation time. Patient's comfort is attributable to the absence of sutures allowing the wound to heal faster and less inflammatory reaction. A smaller the wound size allows a shorter recovery time and minimises post-operative discomfort.[3]

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With 23G instruments, self-sealing sclerotomies are made with a width of 0.72mm. Suture closure is not required because the wound borders will close the incision in a valve-like manner via the intraocular pressure.[4] A sutureless wound may predispose the eye to wound leak.[5] In one study, 3.3% of eyes undergoing 23-gauge vitrectomy experienced transient hypotony on first post-operative day.[6] In another study, 66 eyes were operated with 23-gauge vitrectomy, out of which post-operative hypotony occurred in 2 eyes.[7]

Frequency of post-operative hypotony is 3.3%.[6] Unlike internationally made sophisticated instruments, we use locally made re-usable and cost-effective instruments in our setup, therefore we assume that there may be higher frequency of hypotony in our clinical practice.

The rationale of this study was to find out the frequency of hypotony in 23-gauge transconjunctival vitrectomy with locally made instruments. As yet no study has been published locally on either hypotony or on the use of locally made instruments for 23-gauge vitrectomy. Early recognition of hypotony will help treat such patients and prevent the complication of hypotony. The objective of the study was to find out the frequency of post-operative hypotony after performing 23-gauge vitrectomy with locally made instruments.

Methods and Results

This was a descriptive case series. This study was conducted in the Department of Ophthalmology, Lahore General Hospital Lahore from July 2012 to June 2016. Institutional review board approval was obtained and a sample size of 300 patients was taken. Confidence level of 95% was calculated with a 2.5% margin of error, considering an assumed percentage of 5% post-operative hypotony after 23-gauge vitrectomy. A Non Probability Consecutive Sampling was done.

For this study patients of both genders between the ages of 18 and 65 were included. Patients having retinal detachment, tractional or rhegmatogenous, vitreous haemorrhage and macular surface disorders (assessed

with slit lamp biomicroscope and funds condensing lenses, IOP was measured with AT and fluorescein) were included.

The following patients were not part of the study and included in the exclusion criteria: patients with pre-operative IOP of 6 mmHg or less (measured with AT and fluorescein); patients on IOP lowering drugs e.g. acetazolamide (assessed on drug history); patients with combined surgical procedures e.g. vitrectomy with cataract extraction (assessed with slit lamp biomicroscope); patients with pre-existing intra-ocular inflammation i.e. uveitis (assessed with slit lamp biomicroscope and fundus condensing lenses); post traumatic patients (assessed on history and slit lamp examination); patients with intra-ocular foreign bodies (assessed with slit lamp biomicroscope and fundus condensing lenses) and patients with retinal detachment associated with choroidal detachment (assessed with slit lamp and fundus condensing lenses).

After fulfilling the inclusion criteria, 300 patients were enrolled from Out Patients' Department and Operation Theatre of the LGH Lahore and informed consent was taken from all of them as well as their personal information including their name, age, sex and postal address. All patients were operated by a single surgeon and IOP was measured after first post-operative day, and after intervals of first week, second week, one month and forty days using applanation tonometry (AT) and fluorescein dye. A single post-operative reading of up to 6 mmHg measured and verified with AT was labeled as hypotony. To minimise bias, IOP was measured with AT and fluorescein by another surgeon who was unaware of the procedure. Data was collected by proforma. All data was entered and analysed using SPSS version 11.0. Frequency and percentage was presented for gender. Post-operative intraocular pressure was calculated for mean±standard deviation. Frequency and percentages of hypotony (IOP up to 6 mmHg) was calculated.

All 300 patients fulfilling the inclusion/exclusion criteria were included to find out post-operative hypotony after 23-gauge vitrectomy with locally made instruments. Of the total 127 (42.33%) of the patients were between the ages of 18-30 years and 173 (57.67%) were between the ages of 31-65 years. The mean age was 34.30±9.48 years. In the study group 181 (60.33%) were female and 119 (39.67%) were male.

PROFORMA

Frequency of post operative hypotony after 23 gauge transconjunctival vitrectomy with locally made instruments

Serial No..... Hospital Record No. .....
Date: ..... Patient's name: .....
Age: ..... Gender: .....

Pre-operative intra ocular pressure (mmHg)

Right Eye; ..... mmHg
Left Eye: ..... mmHg

Post-operative intra ocular pressure (mmHg)

	Right Eye	Left Eye
Day 1		
Day 7		
Day 14		
Day 30		
Day 40		
Hypotony:	Yes	No

Mean post-operative intraocular pressure was recorded as 8.32±3.04 mmHg. The number of patients who showed hypotony after 23-G pars plana vitrectomy with locally made instruments was 32 (10.67%), while 268 (89.33 %) had no findings of hypotony. All 32 cases showed hypotony on the first post-operative day only. Stratification for frequency of post-operative hypotony after 23-guage vitrectomy with locally made instruments with regards to gender was done, where out of 32 cases, 56.25% (n=18) were females and 14 (43.75%) were males.

Discussion

Trans conjunctival suture less vitrectomy (TSV) portends a great change in the history of vitreoretinal surgery. Fuji et al[8] introduced 25-gauge TSV back in 2002. Eckardt C[9] started with the 23-gauge TSV in 2005 which was based on the same surgical principals as 25-gauge.[8] In comparison with traditional 20-gauge vitrectomy surgery the 23-gauge technique has small incisions and self-sealing sclerotomy ports. This 23-gauge technique has potential advantages including minimum surgical trauma, decreased post-operative inflammation and early post-operative recovery.[10] Since suturing is not required, it also shortens the operating time.[11]

Hypotony and endophthalmitis can occur with the trans-conjunctival suture-less vitrectomy techniques due to wound leakage.

This study was planned to find out the incidence of hypotony in patients undergoing 23-gauge trans-conjunctival vitrectomy with locally made instruments.

These instruments included trocar and cannula set to make 23-guage sclerostomies ports. As yet no study has been published locally on either hypotony or on the use of locally made instruments for 23-gauge vitrectomy.

In our study 127 (42.33%) of the patients were between the ages of 18-30 years and 173 (57.67%) were between the ages of 31-65 years, and the mean+sd was calculated as 34.30±9.48 years. In the study group 181 (60.33%) were female and 119 (39.67%) were male. Mean post-operative intraocular pressure was recorded as 8.32±3.04mmHg and the frequency of post-operative hypotony after 23-guage vitrectomy with locally made instruments reveals 32 (10.67%) while 268 (89.33%) had no findings of hypotony. Eye pads were applied for a day to the patients who showed hypotony.

Our findings are not much higher than a study which recorded 3.3% of eyes undergoing 23-gauge vitrectomy experienced transient hypotony on first post-operative day.[9] In another study, 66 eyes were operated with 23-gauge vitrectomy, out of which post-operative hypotony occurred in 2 eyes.[7]

Another recent study by Gosse E et al[12] recorded that the extreme fluctuations of intraocular pressure (IOP) on the first post-operative day in patients who underwent 23-gauge suture-less vitrectomy technique was 1/50 of eyes (2%).

The results of our study were as per our expectations understandably due to the nature of our setup. Given that unlike internationally made sophisticated instruments, we use locally made re-usable and cost-effective ones, there is a chance of a higher frequency of hypotony in our clinical practice. However in our study this frequency was not much higher and we are of the view that locally made re-usable and cost-effective instruments may be used for the procedure despite the slightly higher frequency of hypotony.

The limitations of our study included the lack of a control group for a direct comparison and relatively small sample size. Our results are primary in Pakistan; some other trials are required to further authenticate the findings of this study.

However, (TSV) 23-gauge vitrectomy is the most dynamic technique offered for the benefit of patients with low fluctuations in the IOP after surgery.

Conclusion

We concluded that the frequency of post-operative hypotony after 23-gauge vitrectomy with locally made instruments is higher when compared with other studies but not by much. Further studies with larger sample size and inclusion of control group are required to prove the point.

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Conflict of Interest: None
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