



Original Article

Comparison of patient's comfort between two different techniques used for intravitreal injection Bevacizumab in terms of pain and conjunctival congestion

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Objective: To compare level of comfort of patients in terms of pain and conjunctival congestion in intravitreal injection of Avastin (Bevacizumab) between old technique (OT) using speculum for lid retraction and modified technique (MT) with the use of bimanual assistance for lid retraction.

Method: Prospective analytical study. Fifty participants were enrolled in the study. A questionnaire for subjective assessment of patients' comfort in terms of pain and objective assessment of conjunctival congestion was filled according to a predefined congestion scale immediately after intravitreal injections. Patients were followed up for 4 weeks.

Results: Fifty patients were included in this study who were given intravitreal injection Avastin using speculum (OT) and bimanual assistance (MT), 25 with each technique. Our study showed that patients' comfort was much more for modified technique than old technique in terms of pain and congestion. Average pain and congestion score in MT was 2.88 ± 1.16 and 0.36 ± 0.49 respectively. In OT, average pain and congestion score was 4.00 ± 1.91 and 1.60 ± 0.64 respectively. Using paired sample t-test, p -value < 0.001 for both pain and congestion, was statistically significant.

Conclusion: Patients who underwent MT experienced lesser pain and congestion in comparison with those who were injected using OT. Hence, ease and comfort of patient in terms of pain and congestion was much more for MT than OT and MT proved to be a preferable technique in view of patient's comfort.

Keywords: Intravitreal injection, Bevacizumab, pain, conjunctival congestion.



Introduction

Use of intravitreal injection of Avastin (Bevacizumab) has extensively increased in recent past with developments in ophthalmology. Avastin an anti-VEGF (vascular endothelial growth factor), is being used for age related macular degeneration, diabetic retinopathy, neovascular glaucoma, pathological myopia and macular edema due to uveitis or central retinal vein occlusion.¹⁻⁶ Many techniques have been devised for eyelid retraction during intravitreal anti-VEGF. Many Ophthalmic societies recommend use of speculum for lid retraction since it provides sterility which reduces risk of infection.^{7,8} However, it was found that use of speculum posed a higher level of discomfort and pain to the patients with corneal abrasions and risk of increasing intraocular pressure as another problem.^{9,10} Another alternative technique with lesser pain and more comfort was bimanually assisted technique for eyelid retraction.¹¹ Other techniques being conjunctival mold, upper lid retraction using a Desmarres retractor, Cotton-tipped applicator lid retraction.¹²⁻¹⁴ There is lack of literature suggesting relative effectiveness of these techniques in terms of sterility, ease of use, patient's comfort and complications being the most significant one.

Since intravitreal Avastin is to be given multiple times patient's ease and comfort in terms of lesser pain and congestion is very important for compliance as discomfort leads to discontinuation of therapy.¹⁵ Ironically, there are very few studies that have explored injection related pain and comparing patient's comfort for different techniques.^{16,17}

Speculum technique seemed to be more painful and less comfortable for patient acceptance than bimanually assisted lid retraction technique.^{18,19} Here we proceed to determine patient's comfort in term of pain and conjunctival congestion with these two techniques which we could not find in our search of literature.

Aims and Objectives

To determine comfort of patients for intravitreal injection Avastin in terms of lack of pain and conjunctival congestion and to determine a method with best outcome and good compliance.

Methodology

Fifty patients were enrolled in the study. A single center prospective quasi-experimental, questionnaire-based study was conducted at Mayo hospital in Ophthalmology department. All the patients included in the study were greater than 45 years of age and had an indication for intravitreal Avastin use. Patients with cataract or very old patients of age greater than 70 were not included. Informed consent was

taken from all the patients undergoing intravitreal anti-VEGF with two different techniques. Patients were segregated into 2 groups. 25 patients were randomly included in modified technique (MT) in which eyelid retraction was done bimanually with the help of an assistant and 25 patients were injected through old technique (OT) in which speculum was used for eyelid retraction. Patients name, age, gender, laterality of the eye was noted. Procedure was done in operation theatre in sterile environment. All the steps of injection were same for both the groups of patients except eyelid retraction technique. Following are the steps which were taken for both the techniques.

10% pyodine was applied for 5 minutes on the lids and left as such. Two drops of 5% pyodine were instilled in the eye for 5 minutes. after spreading eye sheet, opsite was not applied. Eye Speculum was applied to separate both the upper and lower lid in the old technique (OT) while in modified technique assistant retracted the eyelids with his hands. Patient was asked to look up and a mark was applied in the inferotemporal quadrant at 3.5 mm with the help of a caliper and injection Avastin was given. Injection site was pinched with fine forceps and the needle was taken out. After injection patients were asked to rate pain during the procedure according to a specific pain scale given in table 1. Patients were examined on slit lamp pre- and post- injection for signs of congestion which was measured using the scale given in table 2. Pre and Post-injection visual acuity was also recorded using Snellen's chart. Patients were followed up for 4 weeks after which visual acuity was determined along with post-injection incidence of infection. Results were analyzed in SPSS.

Table 1: Pain Scale

Severity	Pain Score
No pain	0
Very mild	2
Mild	4
Moderate	6
Severe	8
Very severe	10

Table .2
Congestion Scale

Severity	Congestion Scale
No change in eye color with normal conjunctival vessels	0
Diffuse pink color with no prominent scleral vessels	1
Diffuse hyperemia with prominent conjunctival and scleral vessels	2
Conjunctival hemorrhage, dilated vessels	3
Conjunctival hemorrhages, dilated vessels and lid edema	4

Results

Our study showed that patient's comfort was much more for modified technique than old technique in terms of pain and congestion. Out of 25 in MT, 16 (64%) were male, 9 (36%) were female. Average age of this group was 57.04 years. 13 (52%) injections were given in left eye and 12 (48%) in right eye. 14 (56%) eyes were pseudophakic and 11 (44%) were phakic.

Whereas in old technique, out of 25, 15 (60%) were male, 10 (40%) were female. Average age of this group was 54.92 year. 14 (56%) injections were given in left eye and 11 (44%) in right eye. 14 (56%) eyes were pseudophakic and 11 (44%) were phakic. Comparison of pain and congestion in both the techniques with their score is shown in table 3 and 4.

Table .3
Comparison of Pain Score in MT and OT

Pain >	Pain				Total
	Very mild	Mild	Moderate	Severe	
MT	15	9	1	0	25
OT	8	12	2	3	25

Figure. 1

Count of Patients with Score of Pain in Both Groups.

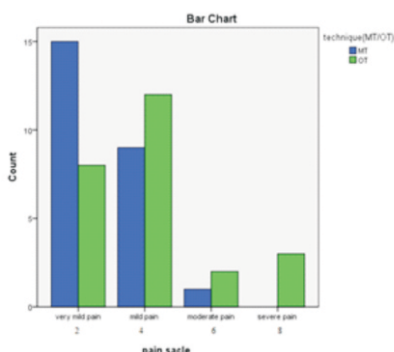


Table 4:
Comparison of Congestion Score in MT and OT

Findings	MT	OT
No change in eye color with normal conjunctival vessels (0)	16	0
Diffuse pink color with no prominent scleral vessels (1)	9	11
Diffuse hyperemia with prominent conjunctival and scleral vessels (2)	0	12
Conjunctival hemorrhage, dilated vessels (3)	0	2
Total	25	25

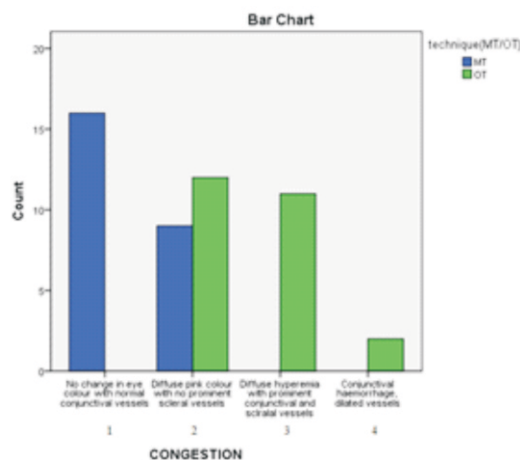


Figure .2

Count of Patients with Score of Congestion in Both Groups

Congestion was much less in MT than OT with very low score and a mean along with standard deviation of 0.36 ±0.49 and 1.60 ±0.64 in MT and OT respectively. p-value for congestion came out to be 0.00 being statistically significant. Same was the case with pain which attained a low score in MT than OT as was evident from bar charts with a mean and standard deviation of 2.88 ±1.66 for MT and 4.00 ±1.915 in OT. p-value for pain was 0.08 Overall results showed low pain and congestion score with bimanually assisted technique (MT) than using speculum (OT). It was also observed that visual acuity was improved in most of the patients of both the techniques and none of the patients developed post- injection endophthalmitis. The only complication was conjunctival hemorrhage in only one patient of OT. Vitreal reflux was noted in 7 patients and it was observed that incidence of reflux was less when needle was drawn out swiftly than gradually drawing it out of globe.

Discussion

Avastin, an anti-VEGF molecule, is currently being injected in vitreous to stop neo-angiogenesis. It has become an important modality of treating many conditions like AMD,



diabetic retinopathy, neovascular glaucoma and many others where growth of new vessels is required to be stopped. Avastin can be injected with different techniques with best technique to be adopted will be the one with best outcome and more comfort to the patient since compliance is required by the patient due to multiple injections need to be given to a single patient. Eyelid retraction technique with speculum (OT) has been compared with bimanually assisted technique (MT) for patient's comfort in terms of pain and was more uncomfortable than MT. We compared these two techniques for patient's comfort in terms of pain and conjunctival congestion. It was found that both pain and congestion were greatly lower in MT than OT. Patient of MT also did not develop any post injection complication and visual acuity was also improved in most of the patients. Patient of OT also did not develop any post injection complication except one patient developing conjunctival hemorrhage along with improvement in visual acuity of most of the patients. We found bimanually assisted technique (MT) to be more comfortable and more preferable. But visual improvement affiliated with technique is still to be studied and correlation if any is to be found.

Conclusion

Use of speculum was more painful and caused more congestion than bimanual assistance for lid retraction. Comfort of the patients in terms of pain and congestion was more in MT than OT. Hence bimanually assisted technique proved to be preferable in view of patient's comfort.

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