ORIGINAL RESEARCH PAPER

Ophthalmology

CHANGES IN KERATOMETRY READINGS BEFORE AND AFTER PTERYGIUM EXCISION SURGERY

KEY WORDS: Corneal Astigmatism, Pterygium surgery, Visual acuity, conjunctival autograft

Dr Anju E*	Junior resident, MVJ Medical college and research hospital, Department of Ophthalmology, Hoskote, Karnataka. *Corresponding Author
Dr Vijay Kumar Srivastava	HOD and Professor, Department of Ophthalmology, MVJ Medical College and Research Hospital, Hoskote, Karnataka
Dr Sujatha V	Professor, Department of Ophthalmology, MVJ Medical College and Research Hospital, Hoskote, Karnataka.
Dr Pallavi B A	Associate professor, Department of Ophthalmology, MVJ Medical College and Research Hospital, Hoskote, Karnataka.
Dr Amudha A	Assistant professor, Department of Ophthalmology, MVJ Medical College and Research Hospital, Hoskote, Karnataka.

ABSTRACT

BACKGROUND: Main aim of our study is to study about the changes in keratometry readings and corneal astigmatism after pterygium excision surgery.**METHOD:** A prospective interventional study was done in 30 patients between the ages of 30 -60 years who presented to department of Ophthalmology with pterygium induced astigmatism during the period of January 2022 to May 2022. Data was collected using a semi structured questionnaires. 30 Patients were evaluated pre-operatively and post operatively with Snellen's chart, Autorefractometry, Slit lamp examination, Keratometry.**RESULTS:** 8 patients (27%) had grade 1 pterygium, 13 (43%) had grade 2 pterygium, 9 patients (30%) had grade 3 pterygium. Mean pre-op KV value 43.46±0.41 decreases to 41.96±0.46 and the mean pre-op KH value 41.34±0.47 decreases to 41.25±0.47 following pterygium surgery with conjunctival autograft. Mean pre-op KV-KH is 0.73±0.69 which decreased to 0.47±0.12 on follow up and the p value is 0.000, thus the study is statistically significant. **CONCLUSION:** In our study pterygium excision with conjunctival autograft leads to significant reduction in corneal astigmatism and thus improves the vision.

INTRODUCTION

Pterygium is a triangular fibrovascular ingrowth of degenerative bulbar conjunctival tissue over the limbus onto the cornea from either side within the interpalpebral fissure area inducing significant astigmatism which may be either 'With-the-rule' (WTR) or 'against- the-rule'(ATR)[1,2]. Pterygium causes visual problems due to induced corneal astigmatism or direct encroachment onto the visual axis. Astigmatism is mainly due to the mechanical traction exerted on the cornea[2,3].

Surgery is the primary treatment of pterygium. Visual acuity can be improved by successful pterygium excision surgery during which astigmatism is reduced and pterygium is removed from the visual axis[2]. Our study was designed to study the change in corneal astigmatism after pterygium excision surgery.

AIMS AND OBJECTIVES

To study the changes in keratometry readings and corneal astigmatism after pterygium excision surgery.

METHODOLOGY

Research design:
Prospective interventional study

Study setting:
Department of ophthalmology, MVJ Medical college and research hospital

Study subjects:
Patients presenting to the OPD with pterygium induced astigmatism

Study duration: 5 months

Data collection:
A prospective interventional study was done in 30 patients between the ages of 30 -60 years who presented to department of Ophthalmology at MVJ Medical college, Bangalore with pterygium induced astigmatism during the period of January 2022 to May 2022. Inclusion and exclusion criteria were followed. The sample size of the study was taken as 30 patients Data collected using semi structured questionnaires. An elaborate written informed consent was taken. 30 Patients were evaluated pre-operatively with Snellen's chart, Autorefractometry, Slit lamp examination, Keratometry All 30 patients had undergone pterygium excision with conjunctival limbal autograft.

Patients were called for follow up on post-operative day 1, 7th and 45th day and were evaluated for corneal astigmatism by noting the keratometry readings.

INCLUSION CRITERIA

1. Patient undergoing surgery for pterygium and who have given informed consent.
2. Male and Female patients of age group 30-60 years.

EXCLUSION CRITERIA

1. Patients with history of recurrent pterygium

2. Pseudopterygium

3. Patients with history of any other corneal infection or scarring in the past

4. Patients with past history of corneal surgery and those with any other ocular pathology

5. Patients with different shapes of cornea– Keratoconus, Keratoglobus etc.

RESULTS AND DISCUSSION

A total 30 patients fulfilling our inclusion criteria were included. Our study includes 30 patients with pterygium induced astigmatism. Out of the 30 patients 16 were males (53.3%) and 14 were females (46.7%).

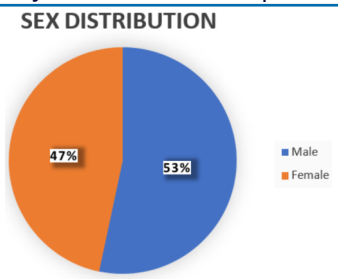


Fig 1

Fig 1

8 patients (27%) had grade 1 pterygium, 13 (43%) had grade 2 pterygium, 9 patients (30%) had grade 3 pterygium.

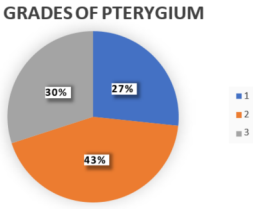


Fig 2

Fig 2

9 patients (30%) belong to the age group of 31-40, 6 patients (20%) belong to 41-50, 15 patients (50%) belong to 51-60.

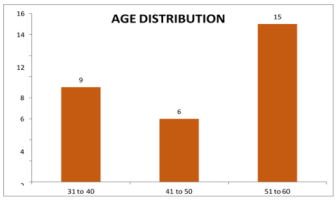


Fig 3

X axis - Age in years
Y axis – Number of patients

In the present study Table 1 showed that there is a significant difference is seen in mean KV and KH when compared pre and post- operatively on regular follow up on day 1,7th and 45th day, such that the mean pre-op KV value 43.46±0.41 decreases to 41.96±0.46 and the mean pre-op KH value 41.34±0.47 decreases to 41.25±0.47 following pterygium surgery with conjunctival autograft.

Table 1

MEAN KV AND KH PRE AND POST OPERATIVELY					
	N	Minimum	Maximum	Mean	Std. Deviation
PRE OP KV	30	42.78	43.95	43.4613	0.40860
PRE OP KH	30	41.34	43.54	42.7303	0.47178
POST OP DAY 1 KV	30	42.67	43.90	43.3667	0.40307
POST OP DAY 1 KH	30	41.32	43.50	42.7060	0.46900
POST OP DAY 7 KV	30	42.56	43.78	43.2703	0.39980
POST OP DAY 7 KH	30	41.30	43.48	42.6657	0.47727
POST OP DAY 45 KV	30	41.96	43.75	43.1093	0.46381
POST OP DAY 45 KH	30	41.25	43.40	42.6423	0.47942
VALLID (N)	30				

KV – Vertical keratometry, KH – Horizontal keratometry

Fig 4 showed that grade 2 patients have significant reduction in the keratometry reading compared to grade 1 and 3.

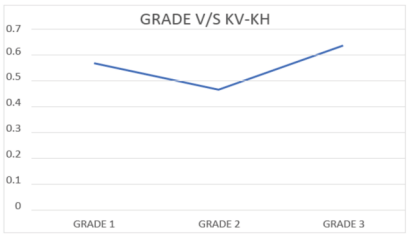


Fig 4

X axis – Grade of pterygium, Y axis – KV-KH

A prospective study conducted by Shastry KP, Sharma N, Singh D et al showed that corneal clarity significantly improved to grade 1 from 32.5% to 80% at final follow up[4]. Similar study conducted by Maheshwari S showed that astigmatism decreased significantly following pterygium excision and visual improvement was noted in 41.67%[5].

Table2 showed that there is difference in keratometry reading while comparing the pre-operative KV-KH value with post-operative KV- KH values on 1st, 7th and 45th days, mean pre-op KV-KH is 0.73±0.69 which decreased to 0.47±0.12 on follow up and the p value is 0.000, thus the study is statistically significant.

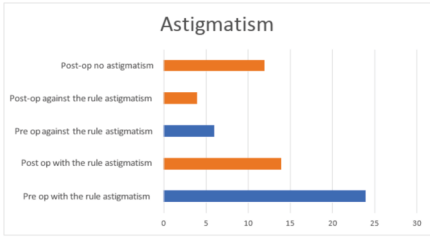
	MEAN	N	STD DEVIATION	STD ERROR OF MEAN
PRE OP KV-KH	0.7310	30	0.68689	0.12541
POST OP (KV-KH) 1st DAY	0.6607	30	0.67056	0.12243
POST OP (KV-KH) 7th day	0.6047	30	0.68143	0.12441
POST OP (KV-KH) 45th DAY	0.4670	30	0.66268	0.120990

Table 2:

Similar study was conducted by Vadodaria B, Thakre A, Maheshgauri R and others and they showed that KV-KH decreases after surgery[1].

Fig 5 showed that Pre-operatively 80% patients had with the rule astigmatism and 20% had against the rule astigmatism and there was a marked reduction in astigmatism following pterygium surgery. With the rule astigmatism reduced to 47% and against the rule astigmatism reduced to 13%.

Fig 5



X axis – Number of patients, Y axis - Astigmatism
BLUE – Pre-op astigmatism
ORANGE- Post-op astigmatism

CONCLUSION

Pterygium leads to significant high corneal astigmatism, which hampers vision of the patient. In our study pterygium excision with conjunctival autograft leads to significant

reduction in corneal astigmatism and thus improves the vision.

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