

Tear Measurement in Custom Ocular Prosthetic

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Abstract: In the direction of comparing the tear excretion side by side among the associated eyes of unioocular prosthetic end-user hence as to categorize them into accurate tear lacking patients as well as tear insufficiency in line for to extra functional problem between unioocular prosthetic users. To discover on sale whether totally patients irritable of dry eye have need of lubricating drops in the direction of correct the difficult of serious or prolonged dryness. Fifty consecutive patients using custom unioocular prosthesis. Patients by custom ocular prosthesis existed managed dry eye indication survey, monitored through socket assessment in addition to Schirmer's exam. Here we present 31 man plus 19 women using the meantime of life of 23.67 years (collection 18-40 years), with involvement of 56% right eyes. On the evaluation of socket, it was 62% anophthalmic socket, 38% disorganized globs. On questionnaire dryness (38%) and discharge (66%) were the chief complaints among all the patients. Cruel Schirmer's I be there 10.3 mm sideways using the prosthesis related 17.7 mm on the usual contralateral. Sockets using prosthesis require compressed tear utility supportive the individual dryness indication that the patients report with the alteration in the scenario of the patient, the addition of a supplement eye drop may be beneficial to the patient

Keywords: Custom unioocular prosthesis; Schirmer's test; Tear function; Anophthalmic socket; Disorganized globes

1. Introduction

Actual simple but then again delicate process can take along the patient back in the direction of a usual way of normal life. Several prosthetic eye users, keeping great maintenance, almost not require any objections concerning it. However then again here can be important digit of information declaring now the patient criticisms similar dryness, uneasiness, crusting of lids plus lashes thru their prosthetic eyes reasons for these difficulties possibly will remain roughed surface, obstinate surface securities, meibomit is before some infective reaction happening the eye, vacant inter planetary between eye and toxic resources composed in the inter-molecular places within PMMA (plastic) artificial eyes^{1, 4, 6}. Identical innovative methods to decrease dryness now the prosthetic users such as termed via Kevin *et al*² in the usage of exclusive exploration popular the domain of oculiaristry known as "The Self Lubricating the ocular Prosthesis (SLPTM)".

SLPTM delivers need for lubrication to the prosthetic eye superficial on behalf of the release for dryness also connected difficulties.

Additional a lot as he refer to in his study that maximum of the patients do not needed a Self-Lubricating Prosthesis (SLP), their difficult is associated toward the superficial of the artificial eye. About patients who loud noise be essential awkwardness in arrears to dryness^{5, 3, 6}. Now the ocular fissure with the prosthesis be necessary promoted as of also polishing of their prosthesis, recommending lubricating now the usage of eye drops otherwise together. Then again the situation is renowned that limited patients require return of a similar discomfort directly when stopping the medicines.

Same slight new certification is created continuously the tear levels now the artificial eye user. This evidence is actual significant for the reason that the situation is noted that dryness plus awkwardness is a common grievance start happening them.

Equally it is a recognized detail the Indian eyes require slightly dissimilar responses in line for to the different climatic circumstances here. Therefore current record in this feature is significant.

Objective

- To discover on view whether totally patients irritable of dry eye need lubricating substitute to correct the difficult of important or prolonged dryness.
- Toward make available the documents existing as a result we can recognize that in what way considerable tears creation occurs happening an anophthalmic fissure plus disfigured globe.
- Toward associate the tear excretion side by side among the associated eye of unioocular artificial eye users just before categorize them addicted to true tear lacking patients then tear insufficiency in arrears to extra physiological (general) complications between unioocular prosthetic users.

Enclosure norms

- 1) Completely subjects who go through evisceration otherwise enucleation in the single eye (unioocular) and using the custom ocular prosthesis.
- 2) Completely subjects by a prosthetic eye intended in lieu of extra than six months.
- 3) Completely subjects who ensure phthisical globe besides atrophic globe plus with the artificial eye.
- 4) Completely subjects who offer respectable support.
- 5) Completely subjects among 18 to 40 years of period be present.

Prohibiting norms

- 1) Subjects by a previous antiquity of radioactivity.
- 2) Subjects who remain go through chemotherapy.
- 3) Subjects thru ill-fitted artificial eye.
- 4) Subjects by way of socket swelling.
- 5) Subjects using a recognized times gone by of dry eyes
- 6) Subjects who was obligating the systemic disease such for example Steven Johnson Syndrome.
- 7) Subjects by severe orbital injury.
- 8) Subject nonstop immunosuppressive medicines.

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2. Materials and Methods

The study existed conceded obtainable 62 subjects however then the records of 50 subjects possibly will stay measured 25 in respectively cluster plus 50 controls (fellow) eye by the Schirmer's test². The situation was thought out in the after process.

Entirely the patients who go to, the division of Ocular Prosthesis once correct of the custom ocular prosthesis, on behalf of a continuation appointment be situated nominated permitting in the direction of the norms cited above also knowledgeable consent remained in use as of to each subject. It was next their agreement that a survey associated to indications was existing by a third individual (a person as of non-optometric contextual also one who was not alert of the study rules).

Subjects taken experienced a complete ophthalmic check up. The ophthalmic investigation contains: visual acuity calculation by Snellen chart, objective and subjective refraction and Slit-lamp investigation by Haag-striet Slit-lamp in lieu of some ocular difficulties monitored through accessing the ocularist's investigation of eye remained finished with the socket as well as the prosthetic eye entirely completed now the similar chamber (by an normal temperature of 16 Degree Celsius) thru the similar assessor and same ocularist to on every occasion.

For the accessibility, we taken distributed the SCHIRMER'S TEST^{2,3} addicted to two groups:

Groups	Description
Schirmer's I a	Tear level quantity using the prosthesis in situ.
Schirmer's I b	Tear level quantity with anesthesia using the prosthesis in situ.
Schirmer's II a	Tear level quantity in the socket devoid of the prosthesis.
Schirmer's II b	Tear level quantity in the socket with anesthesia devoid of the prosthesis.

The form accessible toward the subjects taken inquiries taking place the information of their cleaning timetable, period from the time when the twitch of usage of artificial eye, the indications similar gritty sensation, dryness, burning feeling, pain, discharge, their sympathy actuality extra in midair, light, smoke otherwise else air-conditioned air. The indications existed considered allowing toward the subject's favourite actuality charitable them choices going on a scales says.

- Never --1
- Seldom --2
- Often --3
- Always --4

Outcomes: The study existed finished thru fifty patients (31 Man plus 19 Woman) by their mean age presence 23.67 (18-40) years. Here be present **thirty** out of **fifty** (60%) having an anophthalmic socket, **nineteen** (38%) with atrophic globe and **one** (2%) with micro-ophthalmos (Figure 1).

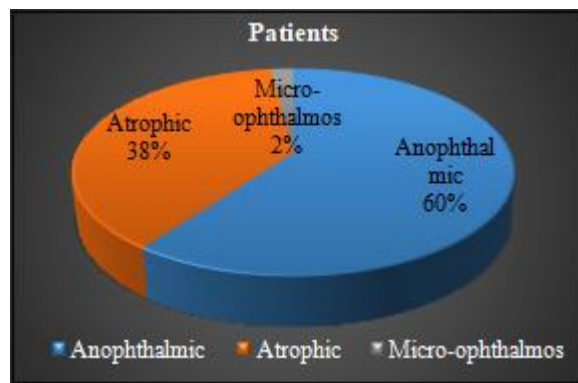


Figure 1

There were **eight** (16%) subjects from 6 months, **twenty-seven** (54%) for a duration of 7 to 24 months, **eight** (16%) subjects using from 25 to 48 months and only **seven** (14%) using prosthetic eye for more than 48 months (Figure 2).

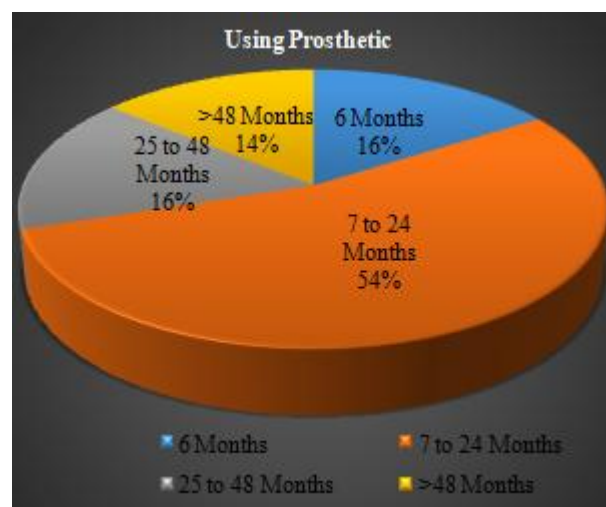


Figure 2

There were **eight** (16%) issues eliminating their prosthetic eye in lieu of cleaning the situation with water and shampoo/water one time now an arranged period of further than 15 to 30 days in addition residual subjects existed surprisingly cleaning it every day with water and shampoo or water. Here existed 25 (50%) subjects who certainly not became their artificial eye polished by fair 18% polishing this one extra than two times (Figure 3).

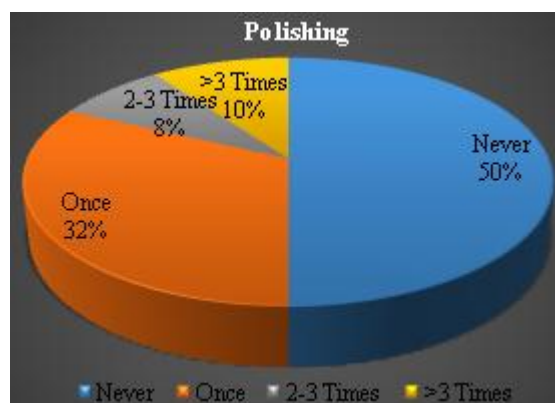


Figure 3

According in the direction of the symptoms, as described by the subjects in the survey, we found subjects were grouchy of the subsequent symptoms.

Symptoms	Subjects
Gritty feeling	11
Itchy feeling	7
Burning sensation	5
Dryness	16
Watering	14
Discharge	33
Pain	2

Hence it existed got that discharge 66% is the indication which is excellently confronted with dryness 32%, while burning sensation 10% plus pain 4% presented little tendency.

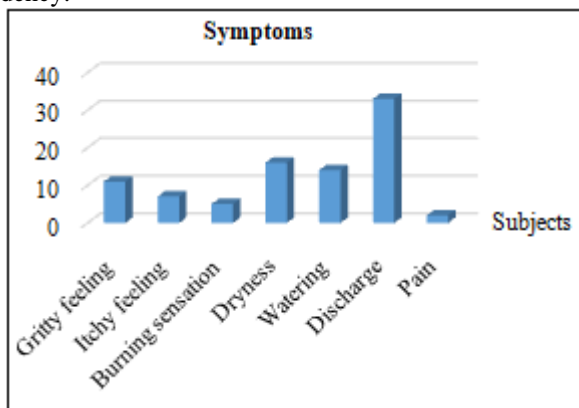


Figure 4

We take 24% subject elusive in the direction of smoke, 62% to light (with sunlight) plus 54% just before air. We take exasperated in the direction of gather information arranged the feeling to computers in addition air-conditioners however more than 50% of subjects had not at all involvement to also of these things forever. Proceeding extra curious, it was even create, 18 patients even by positive types of medicine similar antihistamines, blood pressure medicine plus just 12 out of 50 (24%) consuming many topical medicines with 6 consuming artificial tears alternatives (four in the middle of them were requiring anophthalmic sockets plus two by phthical eye). Table 1 and 2 demonstration that the Schirmer's I a value associated by the indications accessible

Table 1

Schirmer's I a	Gritty	Itchy	Burning	Dryness	Watering
Total number of subjects	50	50	50	50	50
Spearman's Rank	-0.1681	-0.2137	-0.03564	-0.1229	-0.07591
95 % confidence interval	-0.4334 to 0.1241	-0.4711 to 0.0772	-0.3186 to 0.2531	-0.3952 to 0.1693	-0.3544 to 0.2150
P-value (two-tailed)	0.2433	0.1362	0.8059	0.3953	0.6003

Table 2

Schirmer's I A	Discharge	Pain	Smoke	Light	Air
Total number of subjects	50	50	50	50	50
Spearman's Rank	0.0979	0.0399	-0.3317	-0.1876	-0.0777
95 % confidence interval	-0.1937 to 0.3736	-0.2491 to 0.3224	-0.5643 to -0.0503	-0.4497 to 0.1041	-0.3560 to 0.2132
P-value (two-tailed)	0.4987	0.7833	0.0186	0.1919	0.5918

The Schirmer's I a assessment existed associated thru separately of the indications plus originate that no one of the indications connected statistically meaningfully excepting smoke (p=0.0186)

Table 3 and 4 demonstration that the Schirmer's I b assessment linked thru the indications accessible

Table 3

Schirmer's I b	Gritty	Itchy	Burning	Dryness	Watering
Total number of subjects	50	50	50	50	50
Spearman's Rank	-0.1132	-0.0446	0.1150	-0.0158	-0.0884
95 % confidence interval	-0.3869 to 0.1787	-0.3266 to 0.2447	-0.1770 to 0.3884	-0.3007 to 0.2716	-0.3653 to 0.2029
P-value (two-tailed)	0.4336	0.7584	0.4264	0.9131	0.5416

Table 4

Schirmer's I b	Discharge	Pain	Smoke	Light	Air
Total number of subjects	50	50	50	50	50
Spearman's Rank	0.1748	0.0213	-0.2952	-0.1141	0.0551
95% confidence interval	-0.1173 to 0.4390	-0.2666 to 0.3056	-0.5361 to -0.0098	-0.3876 to 0.1779	-0.2348 to 0.3360
P-value (two-tailed)	0.2248	0.8835	0.0374	0.4302	0.7037

The Schirmer's I b assessment existed linked and comparable results might be got through smoke requiring a advanced importance (p=0.0374). Table 5, 6, 7 plus 8 demonstration the Schirmer's II a, b assessment connected using the symptoms accessible

Table 5

Schirmer's II a	Gritty	Itchy	Burning	Dryness	Watering
Total number of subjects	50	50	50	50	50
Spearman's Rank	-0.2447	-0.3154	-0.1285	-0.2652	-0.0109
95 % confidence interval	-0.4986 to 0.0478	-0.5540 to -0.02898	-0.4027 to 0.1668	-0.5248 to 0.0259	-0.2990 to 0.2790
P-value (two-tailed)	0.0901	0.0273	0.3789	0.0655	0.9410

Table 6

Schirmer's II a	Discharge	Pain	Smoke	Light	Air
Total number of subjects	50	50	50	50	50
Spearman's Rank	-0.1219	-0.0093	-0.3463	-0.4179	-0.1698
95 % confidence interval	-0.3970 to 0.1733	-0.2976 to 0.2806	-0.5776 to -0.0636	-0.6308 to 0.1464	-0.4374 to 0.1255
P-value (two-tailed)	0.439	0.9497	0.0148	0.0028	0.2434

Table 7

Schirmer's II b	Gritty	Itchy	Burning	Dryness	Watering
Total number of subjects	49	49	49	49	49
Spearman's Rank	-0.1633	-0.1801	-0.1372	-0.1314	0.0411
95% confidence interval	-0.4320 to 0.1320	-0.4460 to 0.1150	-0.4101 to 0.1582	-0.4051 to 0.1640	-0.2510 to 0.3263
P-value (two-tailed)	0.2622	0.2155	0.3471	0.3682	0.7792

Table 8

Schirmer's II b	Discharge	Pain	Smoke	Light	Air
Total number of subjects	49	49	49	49	49
Spearman's Rank	0.0462	-0.0410	-0.1680	-0.1675	-0.0794
95 % confidence interval	-0.2462 to 0.3309	-0.3262 to 0.2511	-0.4360 to 0.1273	-0.4355 to 0.1278	-0.3602 to 0.2147
P-value (two-tailed)	0.7527	0.7798	0.2485	0.2499	0.5877

The Schirmer's II a, II b showed statistically important association by sympathy to smoke plus light. The records was associated through distributing subjects addicted to two clusters of respectively in also of the anophthalmic sockets besides the extra thru disfigured globe plus moreover the symptoms were associated from now as labeled upstairs and also the records keep on constant by smoke ensuring advanced implication used for together the clusters in both Schirmer's I as well as II.

Tables 9 and 10 presentation the association among profession in addition to symptoms.

Table 9

Profession	Gritty	Itchy	Burning	Dryness	Watering
Total number of subjects	50	50	50	50	50
Spearman's Rank	0.1964	0.2818	0.3405	0.1778	0.2033
95 % confidence interval	-0.9513 to 0.4569	-0.0048 to 0.5256	0.0602 to 0.5710	-0.1142 to 0.4416	-0.0880 to 0.4650
P-value (two-tailed)	0.1716	0.0474	0.0155	0.2166	0.1568

Table 10

Profession	Discharge	Pain	Smoke	Light	Air
Total number of subjects	50	50	50	50	50
Spearman's Rank	0.1051	0.3659	0.2142	0.2109	0.2227
95 % confidence interval	-0.1868 to 0.3798	0.0891 to 0.5903	-0.0767 to 0.4715	-0.0802 to 0.4688	-0.0678 to 0.4780
P-value (two-tailed)	0.4678	0.0090	0.1353	0.1416	0.1200

Profession of all the subjects be different after 24% presence students, 30% of farmers, 38% of workers and 8% actuality housewives. It was associated thru the symptoms similar itchiness, burning feeling, pain be present linking by the profession of the subjects accessible to the health center in addition to was produce that itchy sense, burning sense, and pain be there meaningfully connected by (p=0.0474), p=0.0155) and (p=0.009) correspondingly. Table 11 demonstration the result of the digit of times of polishing the eye on the charge of Schirmer's

Table 11

Polishing	Schirmer's I	Schirmer's II	Schirmer's III	Schirmer's IV
Total number of subjects	50	50	49	49
Spearman's Rank	0.1133	0.0709	0.1143	0.0650
95 % confidence interval	-0.1787 to 0.3870	-0.2198 to 0.3499	-0.1808 to 0.3905	-0.2284 to 0.3475
P-value (two-tailed)	0.4333	0.6249	0.4341	0.6575

Belongings of polishing arranged the assessment some of the Schirmer's be there exasperated then not at all deducible worth might be tense in some of the circumstances.

Table 12

	Prosthetic Eyes(MM)	Control Eyes(MM)
SCHIRMER'S I a	10.7	17.7
SCHIRMER'S I b	7.21	10.5
TBUT	3.62	14.4

Table 12 demonstrations the prices of Schirmer's I a, b (i.e. by plus deprived of anesthesia by the artificial eye in situ exclusively) along with the tear break up time (TBUT) now cooperation the artificial eye besides the control eye. Here existed an extensive is similarity in both the times in both the eye.

The mean significance of Schirmer's I a, was originate to be **10.7mm** on behalf of the subjects by artificial eye and **17.7mm** going on the contralateral usual side of the similar subject. The mean assessment of Schirmer's I b was originate to remain **7.21mm** on behalf of the eyes by prosthesis and **10.5mm** on the contralateral on the side of the control eye. This outcome was regular per the study finished by *Lee Allen et al* wherever they taken set up ready that the tear levels were **less than equal to 20 mm** in the control eyes while less than/ equal to **11 mm** in the prosthetic eye.

3. Discussion

Amazing progress remained bring into being in the symptom toward discharge (66%). The cause in place of this upsurge can be indorsed to the outcome that maximum of the subjects who used the situation for 6 months besides this can be measured according to an early alteration problem for the patient. On the other hand then again the reason on behalf of advanced values in subjects using for an extended period might be due to moderate cleaning schedule monitored otherwise in line for to climatic situations or due to some additional specific details.

In attendance was a greater than before sensitivity patent to light (62%), which involved lights of all types- sunlight, tube lights, as well car lights. Not any detailed causes might be fit on behalf of this result.

The rise in symptoms might be in arrears to the cleaning schedule keep an eye on by 84% of the people who clean the prosthesis every day or formerly in two days, which is reversed then might perhaps worsen the indications in these groups, which was healthy clarified smooth thru the period of dispensing of the artificial eye.

Subjects be present with the artificial eye for extra than 3 years who be necessary acquired their prosthetic eye polished uniform one time. Identical slight ratio of subjects taken go through polishing of the prosthesis just. Now calculation toward the Schirmer's level assessment, the tear break up time (TBUT) plus tear film height were assessed also were originate to be **3.62mm** the prosthetic eye as well as **14.4mm** in the control eyes of the parallel patients plus less than **2mm** in 34 (68%) patients individually.

The situation existed uniform set up that the subjects thru anophthalmic sockets cleaned their artificial eye not enough regularly, persons with disfigured globes who cleaned it much extra frequently. By way of an outcome, they existed far happier than that disfigured globe.

Entirely the subjects accessible toward us were requested to become their prosthesis polished in addition 35(70%) of them were recommended tear substitute also **6 (12%)** were recommended antibiotics on behalf of all individuals who complained of severe discharge problematic.

4. Conclusion

Present can remain various explanations used for the reduction in the tear levels as well as arise in the indicators of the prosthetic customers. Then again we recommend the maximum common cause is that the corneal nervous tension remain absent plus that the bulbar conjunctiva is protected thru the artificial eye, hence removing incentives on behalf of the creation of spontaneous effect tears. This might be particularly correct condition, the average eye reacts happening a controlled mode towards light sensation for example affecting air in addition vaporization of tears to produce fair an acceptable additional. In the meantime the reflex tears quantity record of the aqueous part, maximum of the user remains absent by the lipid plus the mucin layers affecting them just before knowledge dryness in addition to the dense mucoid deposit can be difficult.

The possible alternative in lieu of so long as relaxation toward these patients can be thru given them using appropriate polishing of the superficial and artificial tears which can additional the being there of aqueous layer in the tear plus advantageous circumstances to avoid some infections. This might not be the eventual choicethen again quiet might benefit the patients symptomatically and well as emotionally.

In conclusion, the situation can be smooth resolved that the subjects with anophthalmic sockets remained far extra relaxed than persons through disfigured globes. This part of evidence can comfort us now bringing the attention essential toward the patients allowing toward the group in which they be appropriate.

5. Recommendations

A multicenter revision for a longer interval as well as with a higher people could benefit any to define the precise issues responsible on behalf of the level of the reduced tear in an artificial eye user.

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