

Correlation of Surgical Incision Length with Corneal Endothelial Cell Count

Surgical Incision
Length with
Corneal
Endothelial

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ABSTRACT

Objective: To study the Correlation of Surgical incision length with corneal endothelial cell count.

Study Design: Prospective study

Place and Duration of Study: This study was conducted at the Imran Idris Teaching Hospital Sialkot and Sahara Medical College Narowal during Feb 2019 to May 2020.

Materials and Methods: One hundred persons with ageing process leading to cataracts were requested to take part in the study. It was a study in which the study material was collected once. All those samples were operated for cataract with new technique. To perform the operation the incision was given at the edge of cornea. This incision given followed the 360°. With the help of specular microscope width of different layers of cornea were measured at the center as well as 3mm away from the center. Then with new technique phaco chop procedure, the eye surgeon removed the cataract through a very little hole incision. The thickness of various layers of the cornea was measured 2 times after operation at 1 week and 3 months later.

Results: However, three months post operation, the mean of central endothelial cell count with superior incisions and mean central endothelial cell count with temporal incisions were bit elevated. For the Superior to temporal incisions results of endothelial cell count was bit lower than the other two groups. Overall, one month post operative, mean central endothelial cell count was ten point eight percent and mean endothelial cell count in the sector of the incisions was fourteen percent.

Conclusion: A superior to temporal modern cataract surgery incision may have less endothelial cell count as compared to other incisions. The amount of central endothelial cell count may be less marked in sick persons with longer axial lengths and with methods utilizing less DIALECT.

Key Words: Endothelial Cell Loss; Incision; Phacoemulsification

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INTRODUCTION

Since the main phacoemulsification methodology per framed by Kelman¹ in nineteen hundred sixty seven, corneal. Endothelial cell misfortune stays a genuine straightforwardness and somewhat visual sharpness. In this manner, endeavors to ensure the corneal endothelium and to limit their harm can assume a significant function in improving personal satisfaction in sick person with cataracts.^{3,4} The site through which this technique is performed can effects the loss of corneal endothelial cell count drastically.⁵ The results of pervious study According to past findings, utilizing a burrow cut of sclera, there is no big difference between

incidence and transient cuts chosen dependent on before operation of cataract.² However, so as to limit after operation astigmatism, the area access of corneoscleral may change;² and again, the expert must perform superior to temporal cuts. In the recent findings we suggested about the measure of ECL after clear cornea modern operation of cataract utilizing not rivaled, transient, or superior to temporal cuts. What's more, we assessed. In modern operation of cataract, the measure of ECL decides final after operation corneal patient's refraction. Just eyes in which the lines of longitude on a globe. perpendicular meridian of the cornea was 200 inward of the 0°, 180°, or 90° tomahawks or inside 10° of the 45° (for the left eye) or one hundred thirty five degree (for the correct eye). For each eye, three estimations were done and the normal worth was calculated determined; in any event hundred cells were assessed in every estimation. ECD estimation was rehashed multi week, multi month and three months after operation. So as to quantify ECL we utilized the accompanying recipe.

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MATERIALS AND METHODS

This study was conducted at the Imran Idris Teaching Hospital Sialkot and Sahara Medical College Narowal

during Feb 2019 to May 2020. One hundred persons with ageing process leading to cataracts were requested to take part in the study. It was a study in which the study material was collected once. All those samples were operated for cataract with new technique. To perform the operation the incision was given at the edge of cornea. This incision given followed the 360°. With the help of specular microscope width of different layers of cornea were measured at the center as well as 3mm away from the center. Then with new technique phaco chop procedure, the eye surgeon removed the cataract through a very little hole incision. The thickness of various layers of the cornea was measured 2 times after operation at 1 week and 3 months later.

Inclusion criteria: Age range, forty to sixty years sharp corneal circle at zero degree, one eighty degree or ninety degree ± twenty degree, and forty five degree or

one thirty five degree ± ten degree NS three+ to four+ old age cataract non complicated modern cataract surgery

Exclusion criteria: Diabetic patient KR>48 D or <40 D AL>28 mm or <23 mm ECD<1500 cell/mm² preoperatively Complicated cataract surgery History of intraocular surgery or ocular trauma Pseudoexfoliation or corneal endothelial dystrophy

RESULTS

One hundred patients (100 eyes) including 45 men (45%) and 55 women (55%) with mean age of 53.0±4.5 (range, 42 to 60) years were allocated to three groups according to the incision site: temporal (24 eyes, 24%), superior (34 eyes, 34%) and superotemporal (34 eyes, 34%). Baseline patient data are presented in table 1.

Table No. 1: Baseline patient data

Factor	Mean± SD	Minimum	Maximum
Age (years)	52.96 ± 4.53	41.99	59.99
Axial length (mm)	23.98 ± 0.68	22.96	25.96
Operation time (min)	6.97 ± 0.86	5	
EFT (sec)	6.32 ± 1.66	3	10
Central ECD (cells/mm ²)	2540.8 ± 194.00	2003.99	2896
ECD (temporal)	2542.7 ± 247.96	2144	3237
ECD (superior)	2743.9 ± 205.99	2243	3252
ECD (Superotemporal)	2750.2 ± 230.97	2320	3342

EFT, effective phaco time; ECD, endothelial cell density; SD, standard deviation; Min, minimum; Max, maximum

Table No. 2: Mean ECD (cells/mm²) in the central cornea and the meridian of the incision

Incision group	Central cornea				Meridian of the incision			
	Pre op	1 week Later	1 month later	3 months later	Pre op	1 week later	1 month later	3 months later
Temporal	2573.4±21.8	2360.2±21.96	2296.1±206.8	2304.3±204.7	742.5±247.96	2430.8±250.98	357.99±240.96	2337.9±260.98
Superior	2498.7±180.2	2298.1±170.6	2256.3±180.1	2264.8±185.96	2749.4±230.98	2438.9±216.75	2369.9±220.98	2356.96±227.98
Supratemporal	2497.7±180.8	2330.3±186.6	2256.1±200.96	2266.5±199.96	2745.9±205.96	2428.9±296.95	2364.9±301.99	2350.96±300.96
P-value*s	0.643	0.715	0.701	0.72	0.95	0.92	0.95	0.945

Pre op, preoperatively; SD, standard deviation; ECD, endothelial cell density *ANOVA

Table No. 3: Mean ECL (%) in the central cornea and sector of incision in different incision groups

Incision group	Central cornea			Sector of incision		
	1 week Later	1 month later	3 months later	1 week later	1 month later	3 months later
Temporal	7.99±2.22	10.75±2.30	9.96±2.59	11.40±2.41	14.00±3.11	14.84±4.42
Superior	8.40±2.29	10.96±2.42	10.59±2.90	10.98±5.90	13.98±6.34	14.40±6.40
Supratemporal	7.76±2.00	9.98±2.76	10.30±2.82	11.20±1.90	13.82±2.59	14.20±3.10
P-value	0.378	0.847	0.920	0.91	0.96	0.91

Table No. 4: Correlation between study parameters and mean ECL 3 months postoperatively

Parameter	Corneal center		Meridian of incision	
	Pearson co-eff	P-value	Pearson co-eff	P-value
Age	-0.079	0.447	0.016	0.870
Axial length	-0.410	<0.001	0.115	0.270
EFT	0.535	<0.001	-0.015	0.875
Operation Time	0.159	0.042	-0.140	0.179

ECL, endothelial cell loss; EFT, effective phaco time; Pearson coeff, Pearson coefficient

DISCUSSION

Lately, different methods have been utilized in waterfall medical procedure. The pattern in present day waterfall medical procedure is to limit results, for example, careful injury, corneal consume and loss of lines internal body cavities and the lumens of vessels and to decrease the size of the entry zone to limit after operation astigmatism.^{6,7} Modern cataract surgery is a protected and forceful master plan and thinks to the best quality level for cataract medical procedure. By and by it is still linked with injury.⁶ One of the difficulties of trauma is decrease in corneal early childhood development. In this examination, we assessed the impact of various point of entry locales on corneal early childhood development after operation, and looked at early childhood development in different cut areas and furthermore the focal cornea. As per our outcomes, mean focal early childhood development, many week, many month, and three months after operation were eight point twelve percent, ten point eighty five percent, and ten point forty four percent individually, and was practically identical with different cuts.

Three months after medical procedure, mean sectoral early childhood development was equivalent between the examination bunches at fourteen point nine percent for international cuts, fourteen point five percent for unequalled entry points, and fourteen point four percent for superior to temporal cuts. Previous examinations have detailed various measures of early childhood development (four point three percent, eight point two percent^{8,9} eleven point eight percent, three and eighteen point three percent¹⁰, which might be because of different factors, for example, individual careful method, cut type and area, and cataract thickness. The measure of early childhood development in our sick person was higher than that of previous results. The justification might be that the totally of our sick person had atomic sclerosis of three+ to four+ requiring more significant EFT and henceforth larger early childhood development.^{5,11} We find out the activity through a three point two mm cut on the unmistakable cornea which was depend upon to limit ECL.¹² Similar to the examination by Walkow et al², we chose the entry point site as indicated by before operation an instrument for measuring the curvature of the cornea. They utilized an matchless scleral burrow for cataract removing and their outcomes showed ECL of eight point five percent at a year after operation. This figure was eleven point nine percent in the short in its duration quarters of a circle and eleven point four percent in the matchless quadrant.¹⁴⁻¹⁹

CONCLUSION

A superior to temporal modern cataract surgery incision may have less endothelial cell count as compared to

other incisions. The amount of central endothelial cell count may be less marked in sick persons with longer axial lengths and with methods utilizing less DIALECT.

Author's Contribution:

Concept & Design of Study: Imran Akram Sahaf
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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