EVALUATION OF ANTERIOR AND POSTERIOR SEGMENT FINDINGS AFTER CATARACT SURGERY IN PATIENTS WITH A HISTORY OF RENAL TRANSPLANTATION

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- **Objectives**:

- In this study, we aim to investigate the anterior and posterior segment findings of end-stage renal disease patients who underwent cataract surgery after renal transplantation.

- **Material and Methods:**

- In this cross-sectional study, we included patients who underwent cataract surgery after renal transplantation in our hospital between December 2017 and March 2023. Ocular biometric measurements included axial length (AL), white-to-white (WTW) distance, anterior chamber depth (ACD), corneal keratometry (K_1 and K_2), degree of astigmatism, and lens thickness (LT). Additionally, retinal thickness was measured and compared with healthy control subjects using optic coherence tomography (OCT).

- Data from 87 patients who underwent RTx surgery were reviewed. Among them, 31 RTx patients met the inclusion criteria and were enrolled in this study. We included 48 eyes of 31 RTx patients (24 males, 7 females) and 48 eyes of 32 healthy controls (25 males,7 females).

Results

- There was a statistically significant difference in ocular biometric parameters between the groups. K1, K2, and LT parameters from biometric parameters were found to be statistically significantly higher in the transplantation group ($p < 0.001$; $p < 0.001$; $p = 0.002$, respectively).

- AL and WTW measurements were found to be significantly higher in the control group ($p < 0.001$; $p = 0.021$, respectively). All values of parameters are shown in Table 1.

Table 1: The Ocular Biometric Measurements of Groups

	RTX (n=48)		Control (n=48)		
	Mean± SD	Median (min-max)	Mean± SD	Median (min-max)	p*
AL	23.45±0.82	23.46 (21.57-25.46)	24.83±1.93	24.31 (22.48-30.90)	<0.001
K_1	43.58±1.25	43.66 (40.89-46.33)	42.16±1.63	42.63 (36.51-44.40)	<0.001
Axis	81.7±63.95	78 (0-178)	78.79±69.71	49 (0-176)	0.968
K_2	44.59±1.35	44.52 (41.22-47.73)	42.93±2.13	43.59 (34-45.88)	<0.001
AST	1.04±0.78	0.84 (0.13-3.93)	1.02±0.65	0.83 (0.14-2.79)	0.846
ACD	3.49±0.62	3.4 (2,72-5.48)	3.41±0.37	3.34 (2.38-4.19)	0.983
LT	4.17±1.05	4.53 (0.6-5.19)	4.03±0.59	4.14 (1.18-4.72)	0.002
WTW	12.26±1.26	12 (10.9-17.8)	13.04±1.85	12.4 (10-18)	0.021

RTX: Renal Transplant   SD: Standard Deviation   Min: Minimum   Max: Maximum

AL: Axial Length   ACD: Anterior Chamber Depth   LT: Lens Thickness

WTW: White-To-White   AST: Astigmatism

* p<0.05 significant; Mann Whitney U test

Results

- There was a statistically significant difference in retinal thickness in preoperative superior, nasal, inferior, and temporal parafoveal ($p = 0.002$; $p = 0.011$; $p < 0.001$; $p = 0.002$, respectively) and inferior and temporal perifoveal quadrant measurements ($p = 0.012$; $p = 0.059$, respectively)

- The postoperative foveal thickness average and superior, nasal, inferior, and temporal parafoveal ($p < 0.001$), superior, and nasal perifoveal quadrant measurements ($p = 0.045$; $p = 0.004$, respectively) (Table 2).

Table 2: The Retinal Thickness of Groups

Avarage Retinal Thickness		RTx (n=48)		Control (n=48)		P=
		Mean± SD	Median (min-max)	Mean± SD	Median (min-max)	
Preop	Foveal	274.85±50.06	255 (217-433)	277.23±24.22	277.5 (241-346)	0.049
	Superior PaF	327.25±31.55	330 (201-396)	342.65±18.15	342 (296-372)	0.002
	Nasal PaF	336.94±36.06	332 (275-458)	346.15±20.86	342.5 (309-388)	0.011
	Inferior PaF	324.00±23.75	320.5 (275-415)	341.52±19.75	342 (297-379)	<0.001
	Temporal PaF	322.54±30.94	321 (263-412)	333.06±15.73	332 (301-356)	0.002
	Superior PeF	291.25±30.93	290.5 (201-427)	297.42±17.43	296 (254-334)	0.10
	Nasal PeF	307.23±26.84	308.5 (249-409)	314.75±19.75	312 (278-356)	0.092
	Inferior PeF	278.77±20.45	281 (233-320)	290.29±23.45	287 (228-375)	0.012
	Temporal PeF	279.73±20.19	279 (237-325)	286.67±16.56	287 (251-323)	0.059
Postop	Foveal	262.47±27.88	256 (217-356)	283±21.05	283.5 (244-353)	<0.001
	Superior PaF	321.92±39.46	322 (201-422)	347.46±17.84	352 (297-388)	<0.001
	Nasal PaF	326.47±36.18	324 (237-490)	347.81±18.72	347 (312-388)	<0.001
	Inferior PaF	323.79±30.87	322 (224-447)	346.06±18.69	346,5 (296-382)	<0.001
	Temporal PaF	311.6±32.07	315,5 (202-400)	334.5±18.01	332.5 (308-366)	<0.001
	Superior PeF	291.98±38.25	291 (201-425)	301.85±17.62	300.5 (252-343)	0.045
	Nasal PeF	299.94±25.59	305 (240-354)	316.02±20.27	312 (272-363)	0.004
	Inferior PeF	278.94±24.00	279 (198-320)	285.92±21.67	278.5 (226-354)	0.385
	Temporal PeF	275.67±24.21	276 (206-322)	283.15±16.87	285.5 (244-318)	0.078

RTx: Renal Transplant

SD: Standard Deviation

Min: Minimum

Max: Maximum

Preop: Preoperative

Postop: Postoperative

PaF: Parafoveal

PeF: Perifoveal

*p<0.05 significant; Mann Whitney U test

Conclusion

- This study unveiled crucial insights into the anterior and posterior segment changes observed in RTx patients who undergo cataract surgery, highlighting notable alterations in ocular biometric parameters.

- Findings of this study underscore the multifaceted effect of RTx on ocular microcirculation and metabolism, offering valuable guidance for clinicians in tailoring surgical approaches to optimize visual outcomes for this unique patient cohort.

- However, continued research is imperative to validate and extend our findings, advancing our understanding of ocular health in the complex realm of renal transplantation.