

Table S1 Comparison of segmental anterior corneal surface area, posterior corneal surface area, and corneal volume between all healthy and corneas with KCN

Items		Healthy eyes (n=33)	Corneas with KCN (n=33)	P value
Posterior corneal surface area (mm ²), per segment	1	2.432+/-0.022	2.489+/-0.095	0.002**
	2	2.315+/-0.010	2.341+/-0.033	<0.001***
	3	2.261+/-0.009	2.265+/-0.015	0.55
	4	2.258+/-0.009	2.273+/-0.025	0.003**
	5	2.318+/-0.013	2.340+/-0.035	0.002**
	6	2.435+/-0.021	2.441+/-0.062	0.41
Anterior corneal surface area (mm ²), per segment	1	2.392+/-0.016	2.424+/-0.059	0.005**
	2	2.301+/-0.009	2.314+/-0.022	0.01*
	3	2.259+/-0.009	2.261+/-0.011	0.57
	4	2.256+/-0.006	2.264+/-0.013	0.002**
	5	2.299+/-0.014	2.305+/-0.022	0.30
	6	2.382+/-0.015	2.390+/-0.032	0.75
Corneal volume (mm ³), per segment	1	1.468+/-0.097	1.368+/-0.150	<0.001***
	2	1.363+/-0.085	1.225+/-0.166	<0.001***
	3	1.328+/-0.082	1.180+/-0.140	<0.001***
	4	1.340+/-0.084	1.218+/-0.119	<0.001***
	5	1.397+/-0.089	1.309+/-0.120	0.005**
	6	1.529+/-0.098	1.447+/-0.123	0.01*

*, P<0.05; **, P<0.01; ***, P<0.001. KCN, keratoconus.

Table S2 Comparison of segmental anterior corneal surface area, posterior corneal surface area, and corneal volume between healthy eyes and both more and less advanced corneas with KCN

Items		Healthy eyes (n=21)	More advanced corneas with KCN (n=18)	Healthy vs. more advanced eyes, P value	Less advanced corneas with KCN (n=15)	Healthy vs. less advanced eyes, P value
Posterior corneal surface area (mm ²), per segment	1	2.433+/-0.024	2.525+/-0.111	<0.001***	2.445+/-0.043	0.59
	2	2.317+/-0.010	2.355+/-0.038	<0.001***	2.325+/-0.014	0.08
	3	2.260+/-0.090	2.265+/-0.019	0.68	2.264+/-0.010	0.40
	4	2.259+/-0.009	2.278+/-0.030	0.003**	2.266+/-0.017	0.27
	5	2.319+/-0.012	2.348+/-0.040	0.002**	2.329+/-0.024	0.25
	6	2.438+/-0.022	2.453+/-0.081	0.71	2.427+/-0.018	0.18
Anterior corneal surface area (mm ²), per segment	1	2.394+/-0.015	2.443+/-0.073	0.002**	2.402+/-0.020	0.16
	2	2.303+/-0.088	2.320+/-0.026	0.005**	2.307+/-0.013	0.22
	3	2.257+/-0.010	2.259+/-0.012	0.98	2.262+/-0.010	0.30
	4	2.256+/-0.006	2.267+/-0.016	0.008**	2.261+/-0.006	0.02*
	5	2.299+/-0.013	2.306+/-0.027	0.50	2.304+/-0.013	0.31
	6	2.381+/-0.017	2.395+/-0.040	0.58	2.383+/-0.016	0.95
Corneal volume (mm ³), per segment	1	1.463+/-0.099	1.344+/-0.179	0.01*	1.396+/-0.104	0.07
	2	1.356+/-0.085	1.175+/-0.187	<0.001***	1.283+/-0.110	0.04*
	3	1.320+/-0.080	1.128+/-0.152	<0.001***	1.244+/-0.095	0.03*
	4	1.333+/-0.085	1.175+/-0.130	<0.001***	1.268+/-0.085	0.02*
	5	1.393+/-0.091	1.289+/-0.137	0.02*	1.344+/-0.100	0.17
	6	1.530+/-0.106	1.434+/-0.136	0.06	1.463+/-0.108	0.10

*, P<0.05; **, P<0.01; ***, P<0.001. KCN, keratoconus.

Table S3 Change in corneal anterior corneal surface area, posterior corneal surface area, and corneal volume between all healthy controls and all corneas with KCN

Items		Healthy eyes (n=33)	Corneas with KCN (n=33)	P value
Posterior corneal surface area (mm ²), change per segment	1.5	0.117+/-0.021	0.147+/-0.070	0.12
	2.5	0.054+/-0.012	0.077+/-0.028	<0.001***
	3.5	0.010+/-0.008	0.019+/-0.015	0.001**
	4.5	0.059+/-0.016	0.071+/-0.028	0.12
	5.5	0.117+/-0.018	0.101+/-0.056	0.004**
Anterior corneal surface area (mm ²), change per segment	1.5	0.091+/-0.016	0.110+/-0.044	0.06
	2.5	0.042+/-0.012	0.053+/-0.020	0.02*
	3.5	0.010+/-0.006	0.011+/-0.010	0.98
	4.5	0.043+/-0.015	0.044+/-0.017	0.75
	5.5	0.083+/-0.014	0.085+/-0.023	0.90
Corneal volume (mm ³), change per segment	1.5	0.105+/-0.025	0.143+/-0.056	0.002**
	2.5	0.035+/-0.019	0.050+/-0.042	0.27
	3.5	0.016+/-0.010	0.054+/-0.050	<0.001***
	4.5	0.057+/-0.017	0.095+/-0.050	<0.001***
	5.5	0.132+/-0.030	0.139+/-0.058	0.94

*, P<0.05; **, P<0.01; ***, P<0.001. KCN, keratoconus.

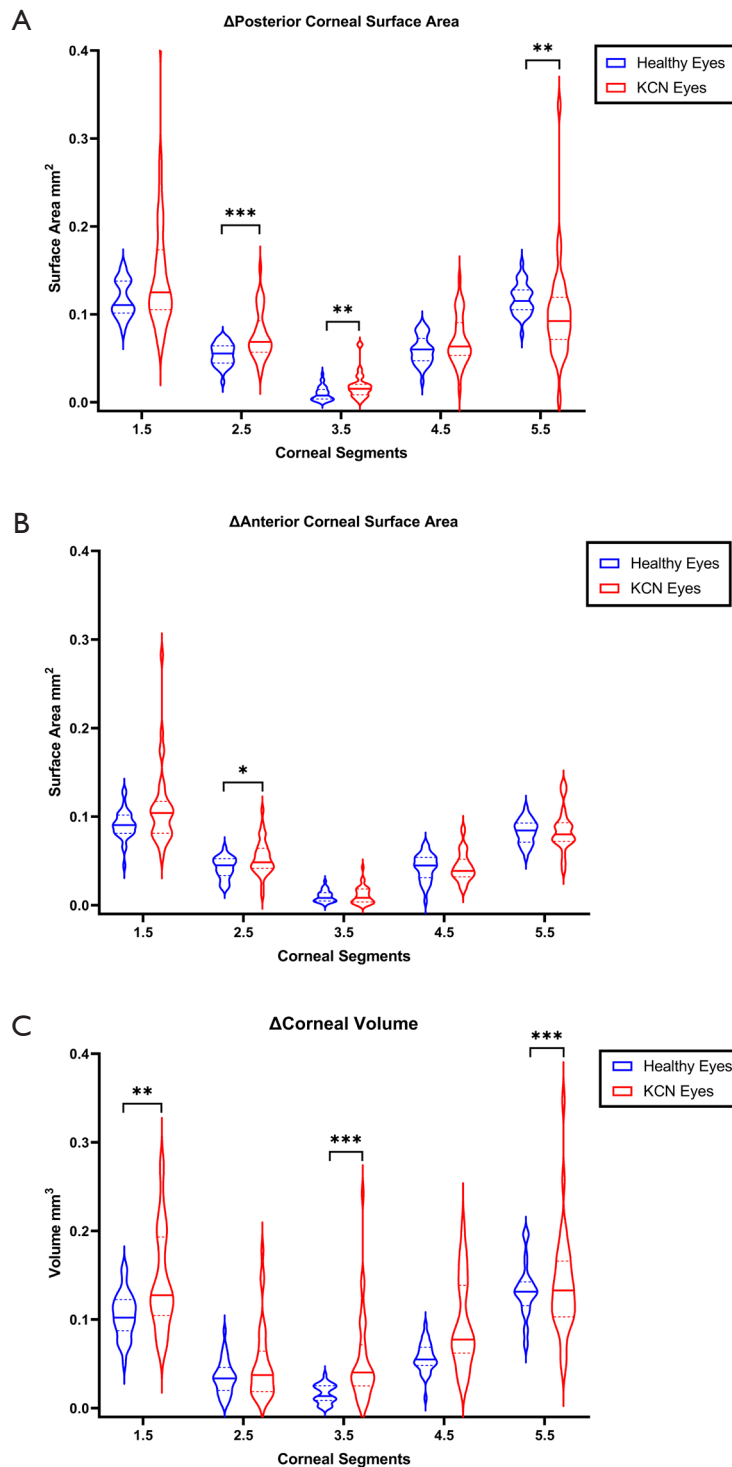


Figure S1 Change in corneal anterior corneal surface area, posterior corneal surface area, and corneal volume compared between all healthy controls and all corneas with KCN. *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$. (A) Comparison of the change in posterior corneal surface area segments between healthy eyes versus eyes with KCN. (B) Comparison of the change in anterior corneal surface area segments between healthy eyes versus eyes with KCN. (C) Comparison of the change in corneal volume segments between healthy eyes versus eyes with KCN. KCN, keratoconus.

Table S4 Change in anterior corneal surface area, posterior corneal surface area, and corneal volume between healthy eyes and both more and less advanced corneas with KCN eyes

Items		Healthy eyes (n=21)	More advanced corneas with KCN (n=18)	Healthy vs. more advanced eyes, P value	Less advanced corneas with KCN (n=15)	Healthy vs. less advanced eyes, P value
Posterior Corneal Surface Area (mm ²), change per segment	1.5	0.116+/-0.021	0.170+/-0.082	0.01*	0.121+/-0.040	0.90
	2.5	0.057+/-0.011	0.090+/-0.030	<0.001***	0.061+/-0.014	0.39
	3.5	0.008+/-0.007	0.023+/-0.019	<0.001***	0.014+/-0.006	0.01*
	4.5	0.061+/-0.013	0.078+/-0.032	0.04*	0.063+/-0.022	0.94
	5.5	0.118+/-0.018	0.104+/-0.073	0.03*	0.098+/-0.026	0.02*
Anterior Corneal Surface Area (mm ²), change per segment	1.5	0.091+/-0.017	0.122+/-0.054	0.05	0.095+/-0.019	0.54
	2.5	0.046+/-0.011	0.061+/-0.020	0.02*	0.044+/-0.016	0.92
	3.5	0.009+/-0.006	0.014+/-0.011	0.22	0.008+/-0.007	0.39
	4.5	0.043+/-0.014	0.044+/-0.020	0.59	0.043+/-0.013	0.53
	5.5	0.082+/-0.013	0.089+/-0.031	0.43	0.080+/-0.007	0.47
Corneal Volume (mm ³), change per segment	1.5	0.107+/-0.026	0.169+/-0.054	<0.001***	0.113+/-0.043	0.97
	2.5	0.035+/-0.018	0.056+/-0.048	0.27	0.042+/-0.034	0.89
	3.5	0.018+/-0.011	0.065+/-0.055	<0.001***	0.038+/-0.039	0.07
	4.5	0.060+/-0.018	0.110+/-0.052	<0.001***	0.076+/-0.041	0.47
	5.5	0.137+/-0.03	0.155+/-0.070	0.44	0.118+/-0.029	0.10

*, P<0.05; ***, P<0.001. KCN, keratoconus.

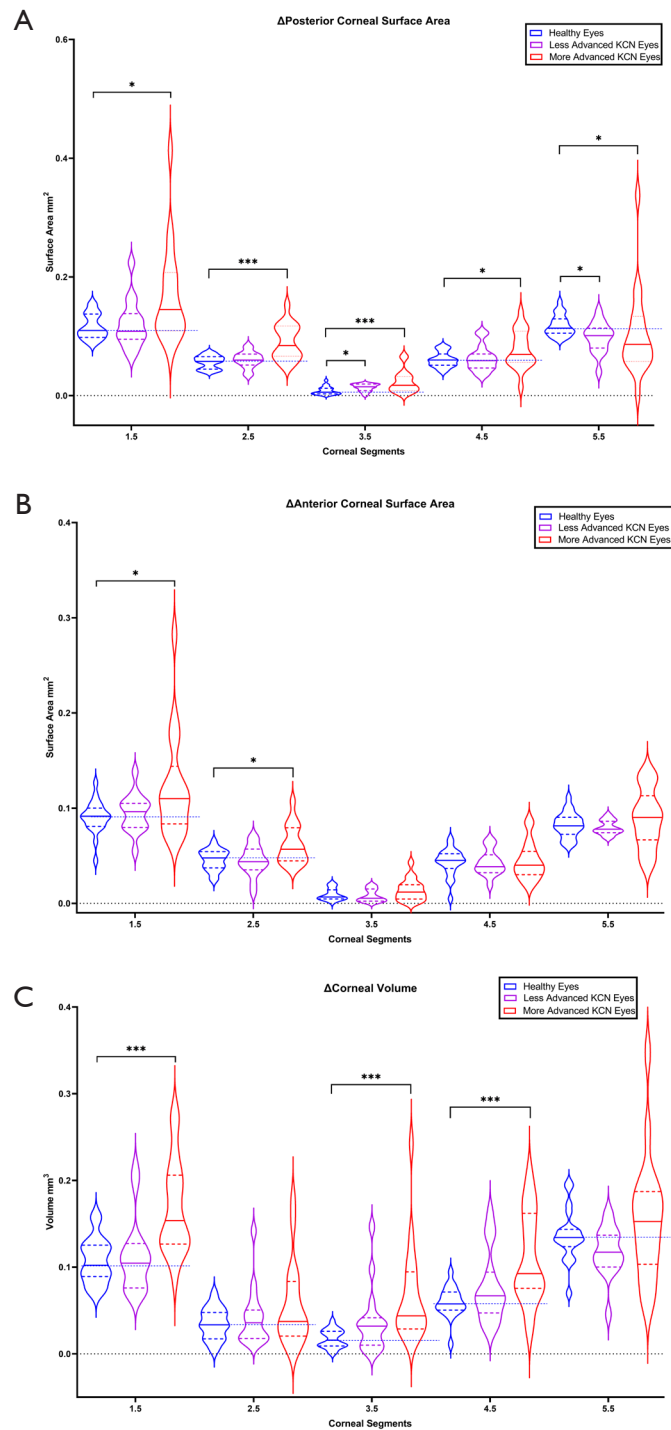


Figure S2 Change in anterior corneal surface area, posterior corneal surface area, and corneal volume compared between healthy controls and both more and less advanced corneas with KCN. *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$. (A) Comparison of change in posterior corneal surface area segments between healthy eyes, less advanced eyes with KCN, and more advanced eyes with KCN. (B) Comparison of the change in anterior corneal surface area segments between healthy eyes, less advanced eyes with KCN, and more advanced eyes with KCN. (C) Comparison of the change in corneal volume segments between healthy eyes, less advanced eyes with KCN, and more advanced eyes with KCN. KCN, keratoconus.