

Supplementary Table 1 Summary of studies involving HOA after SMILE and related parameters

Study	Year	Country	Eyes(n)	Mean age	Mean Sphere(D)	Mean Cylinder(D)	Preop CCT(μ m)	Preop CDVA(log MAR)	Follow-up (mo)	Aberration analyzer	Position	Surgery-related parameters(Model; Energy; Cap Thickness/Diameter; Lenticule Diameter; Incision Length/Location; Other technologies)				
												Postop tHOA	Postop SA	Postop CA	Postop TA	
Xiaojing Li [1]	2015	China	55	22.2 \pm 3.0	-5.74 \pm 1.39	-0.66 \pm 0.70	/	0.00	6	Pentacam HR	Cornea	500-kHz Visumax system; 110-120nJ; 110 μ m/7mm; 6.0mm; 2.0-5.0mm/90 $^\circ$; -	0.95 \pm 0.23	0.41 \pm 0.18	V -0.61 \pm 0.39 H -0.24 \pm 0.19	/
Minjie Ye [2]	2016	China	170	25.3 \pm 4.2	-5.03 \pm 1.89*	/	/	/	6	Pentacam HR	Cornea	500-kHz Visumax system; 130nJ; 120-130 μ m/-; 6.0mm; 4.0-5.0mm/90 $^\circ$; -	0.22 \pm 0.06	0.38 \pm 0.14	V -0.27 \pm 0.22 H 0.09 \pm 0.22	/
Wenjing Wu [3]	2016	China	73	24.5 \pm 6.3	-5.44 \pm 1.30	-0.71 \pm 0.67	551.5 \pm 24.6	/	3	Pentacam HR	Cornea	500-kHz Visumax system; 110 μ m/-; 6.0-6.5mm; 2.0-5.0mm/90 $^\circ$; -	0.82 \pm 0.24	0.48 \pm 0.17	0.54 \pm 0.25	0.10 \pm 0.06
Xiaoqin Chen [4]	2017	China	39	22.0 \pm 4.0	-4.41 \pm 1.23	-2.26 \pm 0.73	/	0.01 \pm 0.03	3	WaveScan	Whole eye	500-kHz Visumax system; 170nJ; 110 μ m/-; 6.0-6.5mm; 2.0-5.0mm/90 $^\circ$; -	0.27 \pm 0.07	0.09 \pm 0.05	/	/
Liuyang Li [5]	2017	China	19	24.6 \pm 4.7	-2.24 \pm 0.67	-0.66 \pm 0.60	550.8 \pm 33.0	/	3	WaveScan	Whole eye	500-kHz Visumax system; 155nJ; 110-120 μ m/7.5-7.6mm; 6.5mm; 3.00-3.13mm/90 $^\circ$; -	0.40 \pm 0.03	0.10 \pm 0.03	V -0.08 \pm 0.05 H -0.05 \pm 0.03	/
	2017	China	20	22.3 \pm 5.2	-4.26 \pm 0.57	-0.46 \pm 0.41	548.6 \pm 22.2	/	3	WaveScan	Whole eye	500-kHz Visumax system; 155nJ; 110-120 μ m/7.5-7.6mm; 6.5mm; 3.00-3.13mm/90 $^\circ$; -	0.46 \pm 0.02	0.22 \pm 0.03	V -0.18 \pm 0.03 H -0.19 \pm 0.03	/
	2017	China	21	24.1 \pm 4.9	-7.02 \pm 0.67	-0.67 \pm 0.64	552.9 \pm 28.2	/	3	WaveScan	Whole eye	500-kHz Visumax system; 155nJ; 110-120 μ m/7.5-7.6mm; 6.5mm; 3.00-3.13mm/90 $^\circ$; -	0.54 \pm 0.03	0.22 \pm 0.02	V -0.24 \pm 0.04 H -0.22 \pm 0.04	/

Hun Lee [6]	2018	South Korea	81	28.3±6.0	-4.66±1.25	-1.03±0.75	548.9±20.7	/	6	Pentacam HR	Cornea	500-kHz Visumax system; 100-115nJ; 120-140µm/-; 6.2-7.0mm; 2.0mm/-; Triple Centration Technique	0.61±0.18	0.37±0.13	0.35±0.19	/
Ikhyun Jun [7]	2018	South Korea	45	24.8±4.6	-3.19±1.55	-2.90±0.42	560.5±29.2	-0.05±0.07	6	Keratron Scout	Cornea	500-kHz Visumax system; -/-; -/-; Triple Centration Technique	0.56±0.14	0.24±0.13	0.31±0.15	0.22±0.13
HongYing Jin [8]	2018	China	65	24.5±7.3	-6.94±1.00	-0.76±0.68	552.6±25.6	/	3	Pentacam HR	Cornea	500-kHz Visumax system; 155nJ; 120µm/7.5-7.6mm; -; 2.0mm/120°; -	0.99±0.28	0.42±0.14	V -0.68±0.31 H -0.04±0.40	/
	2018	China	132	23.8±5.9	-4.13±1.00	-0.64±0.50	541.5±28.0	/	3	Pentacam HR	Cornea	500-kHz Visumax system; 155nJ; 120µm/7.5-7.6mm; -; 2.0mm/120°; -	0.66±0.20	0.26±0.13	V -0.36±0.27 H -0.06±0.27	/
David Sung Yong Kang [9]	2018	South Korea	55	28.6±6.4	-4.41±1.74	-0.90±0.66	553.3±26.1	0.01±0.01	3	Keratron Scout	Cornea	500-kHz Visumax system; -/-; -/-; -	0.57±0.18	0.34±0.14	0.35±0.18	/
	2018	South Korea	55	27.5±6.2	-3.79±1.52	-1.09±0.97	552.6±31.5	0.01±0.01	3	Keratron Scout	Cornea	500-kHz Visumax system; -/-; -/-; Triple Centration Technique	0.55±0.14	0.30±0.13	0.31±0.16	/
Manrong Yu [10]	2019	China	32	24.2±4.5	-4.10±0.90*	/	553.0±27.2	/	3	WASCA	Cornea	500-kHz Visumax system; 130nJ; 120µm/7.5mm; 6.5mm; 2.0mm/90°; -	0.39±0.13	-0.26±0.28	0.73±0.48	0.33±0.20
Meiyan Li [11]	2019	China	68	29.5±5.8	-5.95±1.37	-0.84±0.78	551.8±30.0	-0.07±0.11	3	Pentacam HR	Cornea	500-kHz Visumax system; 130nJ; 100µm/-; 6.5-6.8mm; 2.0-4.5mm/90°; -	0.81±0.25	0.42±0.12	0.59±0.28	/
Weiming Yang [12]	2019	China	29	26.5±7.5	-8.23±0.56	-0.94±0.71	542.9±17.4	-0.01±0.06	6	WASCA	Whole eye	500-kHz Visumax system; 130nJ; 110µm/7.5mm; 6.0-6.5mm; 2.0-2.5mm; -	0.55±0.10	0.28±1.00	0.42±0.14	0.12±0.07

Bing Qin [13]	2019	China	30	24.5±6.8	-6.40±1.29*	-0.79±0.60	540.5±30.1	0.02±0.05	6	WASCA	Cornea	500-kHz Visumax system; 130nJ; 110-120µm/-; 6.0-6.6mm; 2.0mm/90°; -	0.36±0.11	0.09±0.07	0.26±0.13	0.13±0.07
	2019	China	30	26.9±6.1	-10.06±0.77*	-1.24±1.05	547.2±25.1	0.00±0.05	6	WASCA	Cornea	500-kHz Visumax system; 130nJ; 110-120µm/-; 6.0-6.6mm; 2.0mm/90°; -	0.41±0.13	0.20±0.12	0.25±0.14	0.11±0.07
Jay Jiyong Kwak [14]	2020	South Korea	57	25.6±5.5	-4.37±1.98	-1.14±0.82	/	-0.04±0.04	3	iTrace	Cornea	500-kHz Visumax system; -; -/-; -; -/-; Triple Centration Technique	0.46±0.22	0.21±0.14	0.28±0.17	0.17±0.12
Mehmet Gulmez [15]	2020	Turkey	94	28.0±6.4	-4.89±2.31	-1.64±1.45	535.6±27.7	0.02±0.04	6	WaveLight	Cornea	500-kHz Visumax system; 150nJ; 130µm/-; 6.0-6.5mm, 2.0mm/135°; -	0.28±0.11	0.24±0.05	0.17±0.03	0.14±0.02
Yuanyuan Zhong [16]	2020	China	43	24.6±3.9	-5.12±1.77	-2.47±0.54	/	-0.03±0.04	48	Pentacam HR	Cornea	500-kHz Visumax system; 130nJ; 120µm/7.6mm; 6.0-6.9mm; 2.0mm/90°; -	0.84±0.29	0.30±0.17	0.61±0.30	/
	2020	China	31	25.3±4.2	-5.58±1.78	-0.55±0.28	/	-0.04±0.04	48	Pentacam HR	Cornea	500-kHz Visumax system; 130nJ; 120µm/7.6µm; 6.0-6.9mm; 2.0mm/90°; -	0.86±0.28	0.40±0.18	0.63±0.32	/
Fei Xia [17]	2020	China	26	28.3±7.8	-5.95±1.14	-0.76±0.48	544.1±28.2	/	1	Pentacam HR	Cornea	500-kHz Visumax system; 130nJ; 100-110µm/7.5-7.8mm; 6.5-6.8mm; 4.5mm/90°; -	0.49±0.25	0.14±0.09	V 0.05±0.07 H 0.07±0.09	/
Ruoyan Wei [18]	2020	China	103	28.7±5.0	-7.39±0.79	-0.93±0.69	549.4±29.1	-0.03±0.04	6	WASCA	Whole eye	500-kHz Visumax system; 130nJ; 110-120µm/-; 6.2-6.5mm; 2.0mm/90°; -	0.37±0.11	0.14±0.09	0.25±0.13	0.12±0.07
Ikhyun Jun [19]	2021	South Korea	91	27.8±6.0	-3.18±1.28	-0.93±0.69	565.2±24.4	-0.12±0.06	6	WaveLight	Cornea	500-kHz Visumax system; -; -/-; -; -/-; Triple Centration Technique	0.48±0.13	0.26±0.10	0.26±0.14	0.17±0.09

Ikhyun Jun	2021	South Korea	59	27.3±7.0	-3.26±1.49	-0.97±0.94	563.9±22.0	-0.11±0.07	6	WaveLight	Cornea	500-kHz Visumax system; -/-; -/;; Triple Centration Technique	0.53±0.16	0.34±0.13	0.29±0.17	0.15±0.09
D. Rex Hamilton [20]	2021	United States	49	31.6±6.3	-3.77±1.60	-0.50±0.46	/	/	1	Galilei G4	Cornea	500-kHz Visumax system; 125-130nJ(4.5 spot spacing); 120µm/7.5µm; 6.5mm; -/-; -	0.58±0.15	0.32±0.12	0.37±0.14	/
	2021	United States	49	29.1±5.1	-4.02±1.39	-0.10±0.19	/	/	1	Galilei G4	Cornea	500-kHz Visumax system; 125nJ(3.0 spot spacing); 120µm/7.5µm; 6.5mm; -/-; -	0.63±0.13	0.40±0.10	0.39±0.15	/
Yewei Yin [21]	2021	China	51	23.9±4.8	-7.96±0.94*	-0.79±0.51	/	/	6	iTrace	Whole eye	500-kHz Visumax system; 130nJ; 100-120µm/-; 6.0-6.8mm; 4.0mm/90°; -	0.59±0.60	0.26±0.45	0.40±0.41	0.16±0.12
Meng Lin [22]	2021	China	64	23.3±5.0	-4.17±1.55	-0.66±0.54	555.8±31.7	-0.02±0.04	6	OPD-Scan II	Whole eye	500-kHz Visumax system; 135nJ; 120µm/7-8mm; 6.4-6.9mm; 2.0mm/90°; -	0.53±0.26	0.14±0.10	0.29±0.17	0.29±0.11
Yu Zhang [23]	2022	China	102	28.2±6.1	-5.09±1.26	-0.63±0.31	548.0±24.0	/	6	WaveLight	Cornea	500-kHz Visumax system; 140nJ; 120µm/7.6µm; 6.5mm; 2.0mm/-; -	0.70±0.20	0.45±0.16	0.40±0.20	/
Mengjun Fu [24]	2022	China	36	29.4±5.9	-2.58±0.59	0.73±0.44	/	/	24	WASCA	Whole eye	500-kHz Visumax system; 130nJ; 120µm/-; 6.5-6.8mm; 2.0mm/90°; -	0.82±0.53	0.12±0.10	V -0.10±0.18 H 0.08±0.25	/
Cong Zhou [25]	2023	China	100	21.00 [#]	-3.78±0.10	-3.61±0.10	541.1±3.5	0.00±0.00	3	Sirius	Cornea	500-kHz Visumax system; 130nJ; 110-120µm/-; 6.5mm; -/-; -	0.68±0.02	0.37±0.01	0.44±0.02	0.21±0.01
	2023	China	100	18.00 [#]	-0.64±0.06	-0.58±0.06	546.9±3.5	0.00±0.00	3	Sirius	Cornea	500-kHz Visumax system; 130nJ; 110-120µm/-; 6.8mm; -/-; -	0.61±0.02	0.31±0.01	0.37±0.02	0.20±0.01

Wuqiang Luo [26]	2023	China	32	27.7±5.6	-7.84±0.64	-1.00±0.45	546.1±23.3	/	48	WASCA	Whole eye	500-kHz Visumax system; 130nJ; 110-120μm/-; 6.0-6.7mm; -/-; -	0.20±0.08	-3.87±2.43	2.88±2.14	/
This study	2024	China	65	28.6±4.9	-3.35±0.62	-0.76±0.60	537.5±29.7	-0.04±0.04	3	iTrace	Whole eye	500-kHz Visumax system; 110-120nJ; 110-120μm/7.6mm; 6.5mm; 3.0mm/120°; -	0.18±0.08	0.02±0.06	0.11±0.08	0.09±0.04
	2024	China	85	29.0±6.2	-5.53±0.99	-0.89±0.71	535.4±26.4	-0.03±0.04	3	iTrace	Whole eye	500-kHz Visumax system; 110-120nJ; 110-120μm/7.6mm; 6.5mm; 3.0mm/120°; -	0.19±0.77	0.02±0.05	0.14±0.08	0.08±0.05
	2024	China	103	29.3±5.7	-4.50±1.24	-0.47±0.35	532.9±25.0	-0.04±0.04	3	iTrace	Whole eye	500-kHz Visumax system; 110-120nJ; 110-120μm/7.6mm; 6.5mm; 3.0mm/120°; -	0.17±0.07	0.03±0.06	0.12±0.07	0.08±0.04
	2024	China	47	27.6±5.6	-4.78±1.64	-1.62±0.49	539.9±32.2	-0.03±0.04	3	iTrace	Whole eye	500-kHz Visumax system; 110-120nJ; 110-120μm/7.6mm; 6.5mm; 3.0mm/120°; -	0.21±0.09	0.02±0.06	0.15±0.09	0.10±0.06

* Spherical equivalent; # Median of values; CA = coma aberration; CCT = central corneal thickness; CDVA = corrected distance visual acuity; H = horizontal coma aberration; HOA = high order aberration; Postop = Postoperative; SA = spherical aberration; TA = trefoil aberration; tHOA = total high order aberration; V = vertical coma aberration. CDVA was statistically analyzed in the form of LogMAR. All values are displayed in the form of mean ± standard deviation.

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