

Parameter	Minors							Adults						
	T0		T1		T0-T1		P Value	T0		T1		T0-T1		P Value
	Mean	SD	Mean	SD	Mean	SD		Mean	SD	Mean	SD	Mean	SD	
SNA(Angle)	80.35	2.46	79.51	3.39	0.84	2.51	0.08	83.75	2.45	82.96	2.56	0.79	2.21	0.06
SNB(Angle)	76.40	2.96	76.52	2.98	-0.12	1.76	0.71	79.59	2.44	78.38	3.12	1.21	2.32	0.01
ANB(Angle)	3.95	2.09	3.01	2.41	0.94	1.71	0.01	4.16	1.76	4.58	1.94	-0.42	1.45	0.12
U1-SN(Angle)	110.94	7.20	102.90	7.15	8.04	7.41	0.00	110.29	9.22	101.23	7.01	9.06	9.62	0.00
U1-NA(Angle)	30.60	6.85	23.38	6.80	7.22	7.18	0.00	26.54	9.04	18.27	6.91	8.27	9.73	0.00
U1-NA(mm)	7.04	2.70	4.25	2.36	2.79	3.27	0.00	6.92	4.78	2.04	2.43	4.88	4.27	0.00
MP-SN(Angle)	38.01	5.68	36.94	6.39	1.06	2.44	0.02	34.52	5.23	34.93	5.92	-0.41	2.72	0.41
MP-FH(Angle)	32.40	5.47	31.62	6.36	0.78	2.52	0.10	28.86	4.62	29.11	5.55	-0.25	2.27	0.54
L1-MP(Angle)	95.24	7.84	92.16	11.06	3.08	6.79	0.02	98.01	6.96	94.65	6.14	3.36	7.66	0.02
L1-NB(Angle)	29.63	5.52	25.62	7.96	4.02	6.79	0.00	32.13	7.02	27.96	5.20	4.17	7.57	0.00
L1-NB(mm)	6.81	2.35	5.07	2.18	1.74	2.38	0.00	7.69	3.83	5.54	1.97	2.15	4.13	0.01
U1-L1(Angle)	115.82	8.95	128.00	9.73	-12.17	9.33	0.00	117.17	11.10	129.19	9.24	-12.02	13.49	0.00

SD standard deviation, T paired t-test, W Wilcoxon test

Tab1 The cephalometric data of minors and adults before and after orthodontic treatment

Central incisor																	
Parameter	Minors							Adults									
	T0		T1		T1-T0		<i>P^a</i>	T0		T1		T1-T0		<i>P^b</i>	<i>P^c</i>	<i>P^d</i>	<i>P^e</i>
	Mean	SD	Mean	SD	Mean	SD		Mean	SD	Mean	SD	Mean	SD				
La3(mm)	0.60	0.44	0.97	0.45	0.38	0.47	0.00	0.40	0.46	0.57	0.51	0.16	0.44	0.00	0.01	0.00	0.01
La6(mm)	1.18	0.33	1.47	0.52	0.29	0.42	0.00	1.19	0.44	1.28	0.49	0.09	0.46	0.12	0.87	0.04	0.02
La9(mm)	1.49	0.46	1.81	0.82	0.32	0.70	0.00	1.20	0.55	1.46	0.76	0.26	0.85	0.02	0.00	0.02	0.68
P3(mm)	3.20	1.18	2.32	1.55	-0.88	1.21	0.00	2.58	0.89	1.10	0.85	-1.48	0.79	0.00	0.00	0.00	0.00
P6(mm)	4.87	1.83	4.05	2.32	-0.82	1.82	0.00	4.40	1.31	2.71	1.61	-1.70	1.41	0.00	0.12	0.00	0.00
P9(mm)	6.77	2.46	6.44	3.12	-0.33	2.25	0.24	6.88	1.93	5.29	2.56	-1.59	2.67	0.00	0.79	0.04	0.00
T3(mm)	10.32	1.18	9.57	2.14	-0.75	1.72	0.00	9.31	1.18	7.97	1.05	-1.34	0.99	0.00	0.00	0.00	0.02
T6(mm)	11.41	1.78	10.58	2.23	-0.84	1.72	0.00	10.70	1.58	9.12	1.46	-1.58	1.47	0.00	0.03	0.00	0.01
T9(mm)	11.79	2.17	11.52	2.51	-0.26	2.02	0.29	11.58	2.03	10.48	2.14	-1.11	2.23	0.00	0.61	0.02	0.03

Abbreviations: SD, standard deviation; T0, before orthodontic treatment; T1, after orthodontic treatment; T1-T0, difference value during T0 to T1.

P^a represents the P -value of t test of T1-T0 in the minors group.

P^b represents the P -value of t test of T1-T0 in the adults group.

P^c represents the P-value of t test of T0 between the two groups.

P^d represents the P -value of t test of T1 between the two groups.

P^e represents the P -value of t test of T1-T0 between the two groups.

Tab2 Changes of alveolar bone thickness at the crestal, mid-root and apical third in central incisor

Lateral incisor																	
Parameter	Minors							Adults							P^c	P^d	P^e
	T0		T1		T1-T0		P^a	T0		T1		T1-T0		P^b			
	Mean	SD	Mean	SD	Mean	SD		Mean	SD	Mean	SD	Mean	SD				
La3(mm)	0.65	0.45	0.71	0.48	0.06	0.51	0.34	0.45	0.50	0.33	0.42	-0.11	0.49	0.05	0.01	0.00	0.04
La6(mm)	0.80	0.39	1.02	0.46	0.22	0.53	0.00	1.03	0.41	1.04	0.52	0.02	0.49	0.87	0.01	0.99	0.04
La9(mm)	0.92	0.60	1.37	0.67	0.47	0.66	0.00	0.70	0.46	0.94	0.65	0.20	0.48	0.00	0.02	0.00	0.01
P3(mm)	2.18	0.79	1.31	0.87	-0.87	0.81	0.00	1.78	0.70	0.59	0.64	-1.19	0.81	0.00	0.01	0.00	0.01
P6(mm)	3.60	1.27	2.51	1.51	-1.08	1.03	0.00	3.19	1.12	1.65	1.38	-1.55	1.34	0.00	0.07	0.00	0.03
P9(mm)	5.15	1.68	4.26	2.21	-0.89	1.44	0.00	4.96	1.50	3.33	2.08	-1.63	1.69	0.00	0.52	0.03	0.01
T3(mm)	9.13	1.03	8.17	1.19	-0.88	0.94	0.00	8.37	1.05	7.11	0.77	-1.26	0.88	0.00	0.00	0.00	0.02
T6(mm)	10.24	1.44	9.07	1.64	-1.17	1.26	0.00	9.84	1.40	8.14	1.26	-1.70	1.51	0.00	0.15	0.00	0.04
T9(mm)	10.45	1.74	9.58	2.09	-0.86	1.24	0.00	9.93	1.49	8.48	1.94	-1.44	1.59	0.00	0.07	0.00	0.03

Abbreviations: SD, standard deviation; T0, before orthodontic treatment; T1, after orthodontic treatment; T1-T0, difference value during T0 to T1.

P^a represents the P -value of t test of T1-T0 in the minors group.

P^b represents the P -value of t test of T1-T0 in the adults group.

P^c represents the P-value of t test of T0 between the two groups.

P^d represents the P -value of t test of T1 between the two groups.

P^e represents the P -value of t test of T1-T0 between the two groups.

Tab3 Changes of alveolar bone thickness at the crestal, mid-root and apical third in lateral incisor

		Minors								Adults								P^c	P^d	P^e
		Parameter		T0		T1		T1-T0		P^a	T0		T1		T1-T0		P^b			
				Mean	SD	Mean	SD	Mean	SD		Mean	SD	Mean	SD	Mean	SD				
Central incisor	ABD-Lab(mm)	0.81	0.55	0.65	0.50	(0.15)	0.55	0.03	1.45	0.70	1.61	0.93	0.16	0.86	0.03	0.00	0.00	0.02		
	ABD-Pla(mm)	0.65	0.51	0.81	1.03	0.16	1.12	0.25	1.31	0.89	2.20	1.95	0.89	1.81	0.00	0.00	0.00	0.01		
Lateral incisor	ABD-Lab(mm)	0.82	0.49	1.01	1.24	0.06	0.55	0.19	1.63	0.96	2.27	1.67	0.65	1.59	0.00	0.00	0.00	0.01		
	ABD-Pla(mm)	0.53	0.41	0.88	0.61	0.35	0.68	0.00	1.52	3.75	3.04	2.27	1.52	4.43	0.01	0.03	0.00	0.03		

Abbreviations: SD, standard deviation; T0, before orthodontic treatment; T1, after orthodontic treatment; T1-T0, difference value during T0 to T1.

P^a represents the P -value of t test of T1-T0 in the minors group.

P^b represents the P -value of t test of T1-T0 in the adults group.

P^c represents the P-value of t test of T0 between the two groups.

P^d represents the P -value of t test of T1 between the two groups.

P^e represents the P -value of t test of T1-T0 between the two groups.

Tab4 Changes in the labial and palatal alveolar bone height in central incisors and lateral incisors before (T0) and After treatment (T1)

		Minors								Adults								
	Parameter	T0		T1		T1-T0		P^a	T0		T1		T1-T0		P^b	P^c	P^d	P^e
		Mean	SD	Mean	SD	Mean	SD		Mean	SD	Mean	SD	Mean	SD				
Central incisor	ABA-Lab(mm ²)	6.41	1.90	8.54	2.51	2.13	2.58	0.00	5.69	1.92	6.85	3.06	1.16	2.55	0.00	0.03	0.00	0.04
	ABA-Pla(mm ²)	32.98	9.41	26.67	14.28	-6.31	11.98	0.00	29.21	8.15	17.27	10.22	-11.94	9.71	0.00	0.02	0.00	0.01
Lateral incisor	ABA-Lab(mm ²)	4.91	2.53	6.47	2.75	1.84	2.47	0.00	4.07	1.80	4.80	2.39	0.73	2.38	0.01	0.04	0.00	0.01
	ABA-Pla(mm ²)	24.38	8.14	16.13	9.32	-8.25	7.21	0.00	20.12	7.29	10.27	8.79	-9.81	9.13	0.00	0.00	0.00	0.27

Abbreviations: SD, standard deviation; T0, before orthodontic treatment; T1, after orthodontic treatment; T1-T0, difference value during T0 to T1.

P^a represents the P -value of t test of T1-T0 in the minors group.

P^b represents the P -value of t test of T1-T0 in the adults group.

P^c represents the P-value of t test of T0 between the two groups.

P^d represents the P -value of t test of T1 between the two groups.

P^e represents the P -value of t test of T1-T0 between the two groups.

Tab5 Changes in the labial and palatal alveolar bone area in central incisors and lateral incisors before (T0) and After treatment (T1)