Table 1. Cephalometric parameters and definitions used for cephalometric analysis

Parameters	Definitions
Maxillary Skeletal Measurements	
SNA (°)	The angle formed between sella, nasion and point A
Co-A (mm)	The distance between condylion and point A
(FH-N)-A (mm)	The distance from point A to line nasion perpendicular to Frankfort horizontal plane
Mandibular Skeletal Measurements	
SNB (°)	The angle formed between sella, nasion and point B
Pg-NB (mm)	The distance from pogonion to nasion–point B line
Co-Gn (mm)	The distance between condylion and gonion
(FH- N)-Pg (mm)	The distance from point B to line nasion perpendicular to Frankfort horizontal plane
Maxillo-mandibular measurements	
ANB (°)	The angle formed between point A, nasion and point B
Wits appraisal (mm)	Drawn perpendiculars from points A and B onto the occlusal plane and measured the distance between these two points
Facial Height Measurements	
Lower anterior facial height (mm)	The distance from anterior nasal spine to menton
Angular Measurements	
SN/PP (°)	The angle formed between the sella-nasion plane and palatal plane
Occl/SN (°)	The angle formed between occlusal and sella–nasion planes
GoGn/SN (°)	The angle formed between mandibular and sella-nasion planes
Dentoalveolar Measurements	
U1-NA (°)	The angle between long axis of the maxillary central incisor and nasion–point A line
U1-NA (mm)	The distance from the incisal edge of the maxillary central incisor to Nasion–point A line
L1-NB (°)	The angle between long axis of the mandibular central incisor and nasion–point B line
L1-NB (mm)	The distance from the incisal edge of the mandibular central incisor to nasion–point B line
U1/PP (°)	The angle between long axis of the maxillary central incisor and palatal plane
IMPA (°)	The angle between mandibular plane and a line drawn down the long axis of the mandibular incisor
FMIA (°)	The angle between Frankfort horizontal plane and a line drawn down the long axis of the mandibular incisor
Interincisor angle (°)	The angle formed by the intersection of lines drawn through the long axis of the maxillary and mandibular incisors
Overjet (mm)	The distance between the incisal ridges of the upper incisor teeth labially and the incisal ridges of the lower incisor teeth
Overbite (mm)	Vertical (superior-inferior) overlap of the maxillary central incisors over the mandibular central incisors
Soft Tissue Measurements	
UL-S (mm)	The distance from upper lip to Steiner's S line
LL-S (mm)	The distance from lower lip to Steiner's S line
Nasolabial angle (°)	The angle formed by drawing a line tangent to the base of the nose and a line tangent to the upper lip

Table 2. Cephalometric analysis of the patient in pretreatment (T0), precorticotomy (T1), posttreatment (T2) and two years follow up (T3) periods

Cephalometric paramaters	T0	T1	T2	T3
Maxillary Skeletal Measurements				
SNA (°)	80	79,5	79,9	80,2
Co-A (mm)	89	90	90,2	90,1
(FH-N)-A (mm)	1,5	1,5	1,3	1,2
Mandibular Skeletal Measurements				
SNB (°)	80,5	80	81,1	80,9
Pg-NB (mm)	1	2	0,5	0,9
Co-Gn (mm)	122	123,5	122,7	123,1
(FH- N)-Pg (mm)	-2	-1	0,4	0,2
Maxillo-Mandibular Measurements				
ANB (°)	-0,5	-0,5	-1,2	-0,7
Wits appraisal (mm)	-1	-1.5	-2,7	-2,1
Facial Height Measurement				
Lower anterior facial height (mm)	66	69	69,6	69,7
Angular Measurements				
SN/PP (°)	16	17	16,7	16,4
Occl/SN (°)	20	18	17,1	16,6
GoGn/SN (°)	38	39,5	39,9	40,1
Dentoalveolar Measurements				
U1-NA (°)	27	29	33,8	33,1
U1-NA (mm)	8	8,5	8,9	8,7
L1-NB (°)	28	29	22,3	23,2
L1-NB (mm)	8	9	5,2	5,6
U1/PP (°)	120	124	129,3	128,5
IMPA (°)	86	87	82,1	82,4
Interincisor angle (°)	125	123	122,7	122
Overjet (mm)	0	0	2,7	2,3
Overbite (mm)	0	0	2,1	1,9
Soft Tissue Measurements				
UL-S (mm)	0.5	1	1,2	0,9
LL-S (mm)	3	3,5	2,4	2,6
Nasolabial angle (°)	111	109	107,5	108,2

Table 3. CBCT measurements and definitions for assessment of the alveolus.

CBCT measurements	Definitions
I	The vertical alveolar bone level at the labial side is the distance from labial projection of the cementoenamel junction of the lower incisors to alveolar crest at the labial side of the lower incisors
II	The vertical alveolar bone level at the lingual side is the distance from lingual projection of the cementoenamel junction of the lower incisors to alveolar crest at the lingual side of the lower incisors
III	The labial alveolar bone thickness at the apex is the distance between apex of the root of the lower incisors and a line drawn from apex of the root of the lower incisor perpendicular to the labial cortical plate
IV	The lingual alveolar bone thickness at the apex is the distance between apex of the root of the lower incisors and a line drawn from apex of the root of the lower incisor perpendicular to the lingual cortical plate
Cervical alveolar width (ld-ld′ with) (mm) (V)	The distance between the most anterosuperior (ld) and the most posterosuperior (ld′) points on the mandibular alveolus
B-B′ width (mm) (VI)	The distance between the B and the B′ (the lingula projection of the B point at the lingual symphysis border) points
Symphysis Width (mm) (VII)	The perpendicular distance from the pogonion to the most convex point of the lingual curvature of the symphysis
Symphsis Height (mm) (VIII)	The distance from the midpoint of the anterior alveolus to the Menton point.
The Symphsis Ratio	The symphysis ratio was calculated by dividing the symphysis height by the symphysis width

Table 4. CBCT analysis of the patient in precorticotomy (T1), posttreatment (T2) and Two years follow up (T3) periods.

CBCT Measurements	Rigth mandibular cental tooth			Right mandibular canine tooth		
	Pre-op	Post-Treatment	Retention	Pre-op	Post-Treatment	Retention
I	1,26	0,90	0,89	1,65	1,27	0,80
II	1,27	0,89	0,89	1,26	1,20	0,80
III	2,04	2,83	3,22	1,27	1,34	2,04
IV	2,43	2,43	2	4,08	4,56	4,08
Cervical alveolar width (ld-ld′ width) (mm) / V	6,32	6,32	6,21	8,09	8,09	8,41
B-B′ width (mm) / VI	7,16	7,44	7,44	4,56	5,73	6,11
Symphysis Width (mm)/VII	10,98	11,29	11,09	9,84	9,14	9,36
Symphsis Height (mm) VIII	31,57	32,56	32,52	29,77	29,47	29,30
Symphsis Ratio	2,88	2,88	2,93	3,03	3,22	3,13

CBCT measurements were performed at the Right Mandibular Central and Right Mandibular Canine Teeth.