Supplementary Material S1: Synthetic orthodontic–periodontal case scenarios and clinical data

## CASES

*Note: The following cases do not represent actual patient data; they are synthetic scenarios representing clinically plausible presentations described in the literature. Cephalometric, dental, and periodontal values were generated within accepted anatomical and clinical limits and were designed to be internally consistent. Definitive findings regarding three-dimensional bone morphology were provided only in cases for which supporting imaging was specified.*

## *PROMPT*

Generate **photorealistic synthetic orthodontic records** based on the characteristics provided below. Third molars are excluded from the assessment. There are no missing or supernumerary teeth. Each dental arch contains 14 teeth, including the second permanent molars, resulting in a total of 28 teeth. There is no significant Bolton discrepancy or history of previous orthodontic treatment.

Accurately and realistically represent the specified **orthodontic and periodontal findings** without introducing any unspecified characteristics.

Generate **five standard orthodontic records** for the same patient:

- Frontal intraoral photograph
- Right lateral intraoral photograph
- Left lateral intraoral photograph
- Maxillary occlusal intraoral photograph
- Mandibular occlusal intraoral photograph

**Radiographic images:** Panoramic and lateral cephalometric radiographs should not be generated routinely. These images should be generated only when separately and explicitly requested for the respective case. When requested, the radiographic images must be anatomically consistent with the intraoral images of the same patient and compatible with the specified clinical, periodontal, and cephalometric parameters.

All images must be **anatomically consistent with one another** and **compatible with the specified clinical and cephalometric parameters.**

*Note: A standardized master prompt was used to generate all synthetic orthodontic records. Throughout the image generation process, this master prompt remained unchanged across all cases. The orthodontic, cephalometric, and periodontal characteristics of each case were appended to the master prompt as case-specific data.*

*Note: The treatment plans for the cases were prepared to enable the AI evaluators to complete the relevant fields of the assessment form used in the study in a comprehensive and standardized manner. These plans were developed as part of the synthetic case scenarios and were structured to provide the clinical information required for the assessment process.*

## Pilot Case

**Orthodontic Data**

**SNA:** 81°
**SNB:** 79°
**ANB:** 2°
**SN-GoGn:** 33°
**Maxillary arch crowding/spacing:** ≈5 mm of moderate crowding
**Mandibular arch crowding/spacing:** ≈6 mm of moderate crowding
**U1-SN:** 101°
**IMPA:** 90°
**Overjet:** 2 mm
**Overbite:** 3 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Mild maxillary arch constriction of dental origin.
**Additional relevant clinical finding:** Space deficiency in both arches, with particularly pronounced crowding in the mandibular anterior region.

**Periodontal Data**

**Periodontal inflammation status:** Generalized gingival inflammation with pronounced erythema, edema, and bleeding on probing.
**Periodontal diagnosis:** Rapidly progressing periodontitis (Grade C; clinical presentation consistent with aggressive periodontitis according to conventional terminology).
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Pronounced clinical attachment loss, particularly in the mandibular anterior and molar regions.
**Alveolar bone status:** Radiographically evident, pronounced alveolar bone loss disproportionate to the patient's age, with vertical bone defects in some regions.
**Gingival recession:** Pronounced, particularly in the mandibular anterior region; consistent with Cairo RT2 and Miller Class II–III in some teeth.
**Keratinized tissue:** Inadequate width (<2 mm), particularly in the mandibular anterior region.
**Periodontal finding relevant to orthodontic treatment:** High periodontal risk of dehiscence and progression of gingival recession, particularly during labial movement of the mandibular incisors, due to the thin gingival phenotype, inadequate keratinized tissue, and existing bone and attachment loss.



## Calibration Case

### Orthodontic Data

**SNA:** 82°
**SNB:** 76°
**ANB:** 6°
**SN-GoGn:** 36°
**Maxillary arch crowding/spacing:** ≈4 mm of moderate crowding
**Mandibular arch crowding/spacing:** ≈6 mm of moderate crowding
**U1-SN:** 108°
**IMPA:** 95°
**Overjet:** 6 mm
**Overbite:** 4 mm
**Right molar relationship:** Class II
**Left molar relationship:** Class II
**Right canine relationship:** Class II
**Left canine relationship:** Class II
**Transverse finding:** Mild maxillary arch constriction of dental origin.
**Additional relevant clinical finding:** Class II presentation associated with mandibular retrognathia, with space deficiency and a tendency toward proclination in both arches.

### Periodontal Data

**Oral hygiene:** Poor, with generalized plaque accumulation and supragingival/subgingival calculus deposits.
**Periodontal inflammation status:** Generalized gingival inflammation, bleeding on probing, and pronounced erythema, particularly in the mandibular anterior region.
**Periodontal diagnosis:** Rapidly progressing periodontitis (Grade C; clinical presentation consistent with aggressive periodontitis according to conventional terminology).
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Pronounced clinical attachment loss in the anterior and molar regions.
**Alveolar bone status:** Radiographically evident, pronounced horizontal and localized vertical

bone loss, with reduced alveolar bone support in the mandibular anterior region.
**Gingival recession:** Multiple sites of gingival recession, particularly pronounced at the mandibular incisors, consistent with Cairo RT2 and Miller Class II–III classifications.
**Keratinized tissue:** Inadequate width (<2 mm) in the mandibular anterior region.
**Periodontal finding relevant to orthodontic treatment:** High periodontal risk of exceeding the buccal alveolar bone boundaries and progression of gingival recession, particularly during mandibular incisor proclination and Class II camouflage treatment, due to existing bone loss, the thin gingival phenotype, and inadequate keratinized tissue.




## Case 1

### Orthodontic Data

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship.
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors, with balanced skeletal and dental relationships.

### Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable; negative bleeding on probing.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Normal/adequate support; no clinical attachment loss.

**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate in all regions.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 2

### Orthodontic Data

**SNA:** 81°
**SNB:** 79°
**ANB:** 2°
**SN-GoGn:** 33°
**Maxillary arch crowding/spacing:** ≈5 mm of moderate crowding
**Mandibular arch crowding/spacing:** ≈6 mm of moderate crowding
**U1-SN:** 101°
**IMPA:** 90°
**Overjet:** 2 mm
**Overbite:** 3 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Mild maxillary arch constriction of dental origin.
**Additional relevant clinical finding:** Space deficiency in both arches.

### Periodontal Data

**Periodontal inflammation status:** Localized plaque-induced gingival inflammation, with erythema and positive bleeding on probing, particularly in the mandibular anterior region.
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Adequate support; no clinical attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 3

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 30°
**Maxillary arch crowding/spacing:** ≈4 mm of moderate crowding
**Mandibular arch crowding/spacing:** ≈9 mm of severe crowding
**U1-SN:** 102°
**IMPA:** 88°
**Overjet:** 3 mm
**Overbite:** 4 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship.
**Additional relevant clinical finding:** Pronounced space deficiency in the mandibular anterior region, with a slight tendency toward retroclination of the mandibular incisors.

**Periodontal Data**

**Periodontal inflammation status:** Generalized plaque-induced gingival inflammation, with widespread erythema, edema, and positive bleeding on probing.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support; no clinical attachment loss.
**Alveolar bone status:** Radiographically preserved bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Fixed orthodontic treatment involving the extraction of four premolars is planned to create space in both arches and achieve dental alignment and leveling.




## Case 4

**Orthodontic Data**

**SNA:** 84°
**SNB:** 81°
**ANB:** 3°
**SN-GoGn:** 34°
**Maxillary arch crowding/spacing:** Well-aligned teeth (≈0 mm)
**Mandibular arch crowding/spacing:** ≈1 mm of mild crowding
**U1-SN:** 112°
**IMPA:** 100°
**Overjet:** 4 mm
**Overbite:** 2 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship.
**Additional relevant clinical finding:** Proclination of the maxillary and mandibular incisors, lip protrusion, and reduced lip competence; the anterior alveolar boundaries are relevant to the anterior positioning of the incisors.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable; negative bleeding on probing.
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** No interproximal attachment loss; attachment loss limited

to the buccal surfaces of teeth 11 and 21.
**Alveolar bone status:** Interproximal bone levels are preserved; three-dimensional imaging has not been specified for definitive assessment of the anterior labial alveolar boundaries.
**Gingival recession:** Buccal gingival recession of 3 mm at teeth 11 and 21, with preserved interproximal attachment, consistent with Cairo RT1.
**Keratinized tissue:** Reduced width in the maxillary anterior region, measuring approximately 1.5–2 mm at the affected teeth.
**Orthodontic treatment plan:** Fixed orthodontic treatment involving the extraction of four premolars (14, 24, 34, and 44) is planned, with the extraction spaces used for incisor retraction and retroclination.




## Case 5

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 30°
**Maxillary arch crowding/spacing:** ≈6 mm of spacing (generalized diastemas)
**Mandibular arch crowding/spacing:** ≈2 mm of spacing
**U1-SN:** 100°
**IMPA:** 90°
**Overjet:** 3 mm
**Overbite:** 3 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship.
**Additional relevant clinical finding:** Maxillary midline diastema and generalized interdental spacing; no history of a discrepancy between tongue size and tooth size has been specified.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to close multiple diastemas using moderate anchorage.



## Case 6

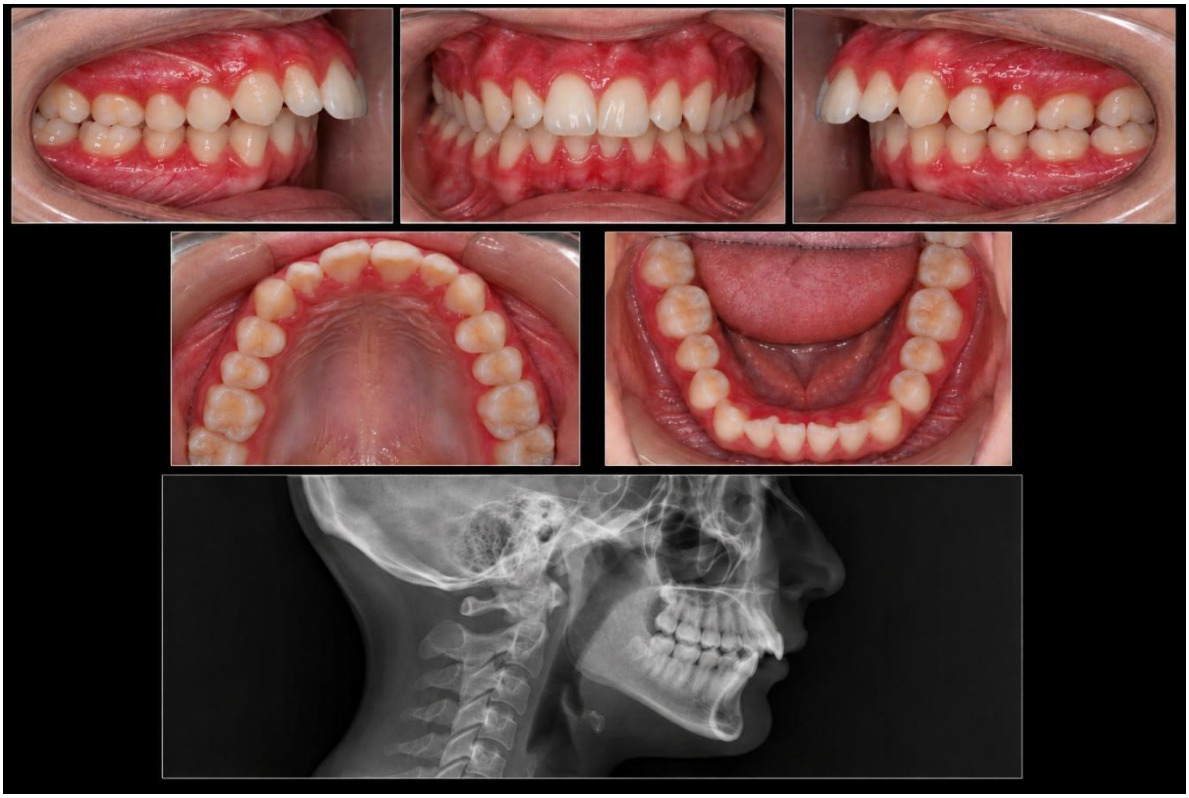
### Orthodontic Data

**SNA:** 83°
**SNB:** 77°
**ANB:** 6°
**SN-GoGn:** 33°
**Maxillary arch crowding/spacing:** ≈2 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 110°
**IMPA:** 95°
**Overjet:** 8 mm
**Overbite:** 4 mm
**Right molar relationship:** Class II
**Left molar relationship:** Class II
**Right canine relationship:** Class II
**Left canine relationship:** Class II
**Transverse finding:** Normal transverse relationship.
**Additional relevant clinical finding:** Increased overjet and difficulty achieving lip closure associated with mandibular retrognathia. Age: 12 years; active growth period.

### Periodontal Data

**Periodontal inflammation status:** Generalized plaque-induced gingival inflammation with positive bleeding on probing.

**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support; no clinical attachment loss.
**Alveolar bone status:** Radiographically preserved bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Functional orthopedic treatment using a removable functional appliance is planned to achieve mandibular advancement.



## Case 7

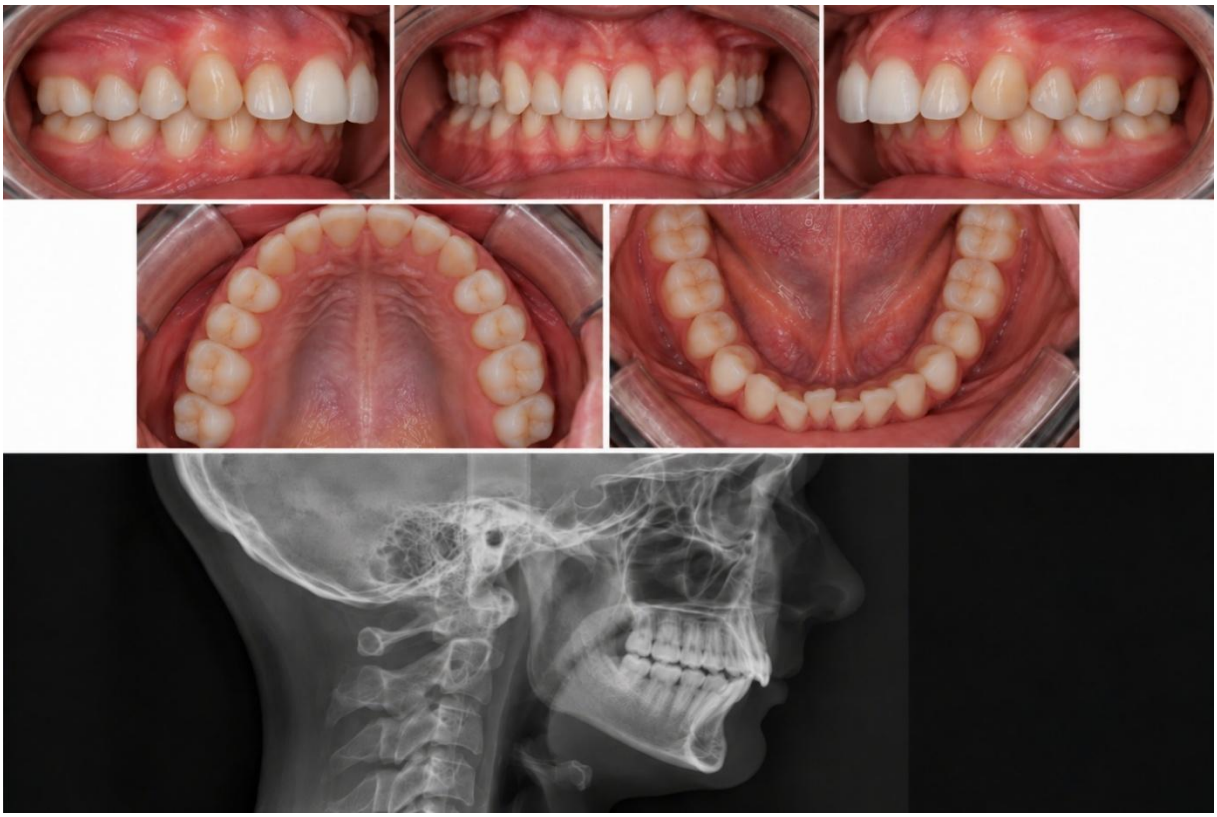
**Orthodontic Data**

**SNA:** 82°
**SNB:** 76°
**ANB:** 6°
**SN-GoGn:** 24°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈4 mm of moderate crowding
**U1-SN:** 108°
**IMPA:** 92°
**Overjet:** 7 mm
**Overbite:** 6 mm
**Right molar relationship:** Class II
**Left molar relationship:** Class II
**Right canine relationship:** Class II
**Left canine relationship:** Class II
**Transverse finding:** Normal transverse relationship.

**Additional relevant clinical finding:** Low mandibular plane angle, pronounced curve of Spee, and deep bite, with a tendency for the mandibular incisors to contact the palatal mucosa.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable, with a tendency toward localized mechanical irritation of the palatal mucosa associated with the deep bite.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Functional orthodontic treatment combined with mandibular incisor intrusion is planned to correct the Class II relationship.



## Case 8

**Orthodontic Data**

**SNA:** 82°
**SNB:** 78°
**ANB:** 4°
**SN-GoGn:** 26°
**Maxillary arch crowding/spacing:** ≈2 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 95°
**IMPA:** 88°
**Overjet:** 2 mm
**Overbite:** 6 mm

**Right molar relationship:** Class II
**Left molar relationship:** Class II
**Right canine relationship:** Class II
**Left canine relationship:** Class II
**Transverse finding:** Normal transverse relationship.
**Additional relevant clinical finding:** Retroclination of the maxillary central incisors and relatively labial positioning of the lateral incisors, presenting a typical Class II Division 2 pattern with a deep bite.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable; negative bleeding on probing.
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** No interproximal attachment loss; attachment loss limited to the buccal surface of tooth 12.
**Alveolar bone status:** Interproximal bone levels are preserved; labial bone support at tooth 12 appears clinically thin.
**Gingival recession:** Buccal gingival recession of 4 mm at tooth 12, with preserved interproximal attachment, consistent with Cairo RT1.
**Keratinized tissue:** Reduced width at tooth 12, measuring approximately 1 mm.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned, involving proclination/protrusion of the maxillary incisors and correction of the Class II relationship through dental camouflage.



## Case 9

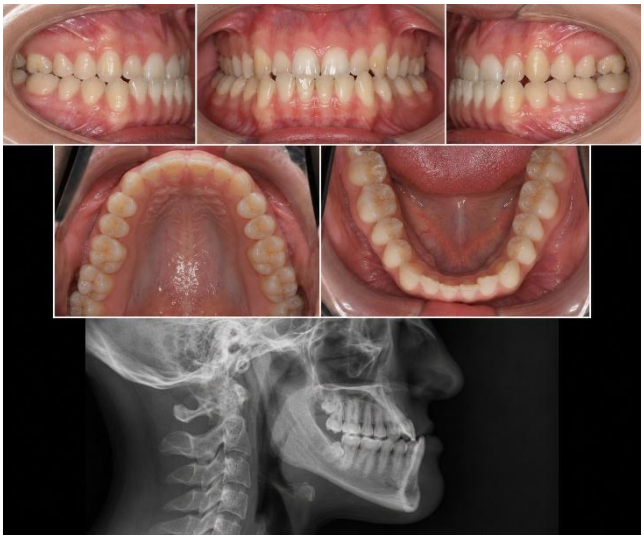
**Orthodontic Data**

**SNA:** 79°
**SNB:** 83°
**ANB:** −4°
**SN-GoGn:** 35°
**Maxillary arch crowding/spacing:** ≈3 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈2 mm of mild crowding

**U1-SN:** 108°
**IMPA:** 84°
**Overjet:** −3 mm
**Overbite:** 1 mm
**Right molar relationship:** Class III
**Left molar relationship:** Class III
**Right canine relationship:** Class III
**Left canine relationship:** Class III
**Transverse finding:** Mild maxillary transverse constriction.
**Additional relevant clinical finding:** Skeletal Class III relationship with a tendency toward maxillary retrognathia and pronounced dental compensation; the mandibular incisors are already retroclined. Age: 20 years; growth is complete.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Adequate but limited periodontal support in the mandibular anterior region.
**Alveolar bone status:** The labial alveolar boundary of the mandibular incisors shows a tendency toward thinness.
**Gingival recession:** None/incipient tendency toward gingival recession in the mandibular anterior region.
**Keratinized tissue:** Reduced width in the mandibular anterior region.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to correct the Class III relationship through dental camouflage.



## Case 10

**Orthodontic Data**

**SNA:** 81°
**SNB:** 82°
**ANB:** −1°
**SN-GoGn:** 32°
**Maxillary arch crowding/spacing:** ≈4 mm of moderate crowding

**Mandibular arch crowding/spacing:** ≈1 mm of mild crowding
**U1-SN:** 98°
**IMPA:** 92°
**Overjet:** −1 mm
**Overbite:** 2 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship.
**Additional relevant clinical finding:** Anterior dental crossbite associated with retroclination of the maxillary incisors; Class I molar relationship. Possible anterior functional shift.

**Periodontal Data**

**Periodontal inflammation status:** Localized plaque-induced gingival inflammation, with erythema and positive bleeding on probing in the maxillary anterior region.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support; no clinical attachment loss.
**Alveolar bone status:** Radiographically preserved bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Proclination/protrusion of the maxillary incisors is planned using a removable appliance or fixed orthodontic treatment.



## Case 11

### Orthodontic Data

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 33°
**Maxillary arch crowding/spacing:** ≈5 mm of moderate crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 102°
**IMPA:** 91°
**Overjet:** 3 mm
**Overbite:** 3 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Bilateral posterior crossbite; maxillary transverse constriction and a high/narrow palatal vault.
**Additional relevant clinical finding:** Age: 11 years; active growth period and early sutural maturation.

## Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Adequate support.
**Alveolar bone status:** Posterior buccal alveolar bone is relevant to transverse changes (clinical assessment; imaging for definitive bone thickness has not been specified).
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Transverse maxillary expansion using rapid maxillary expansion is planned.



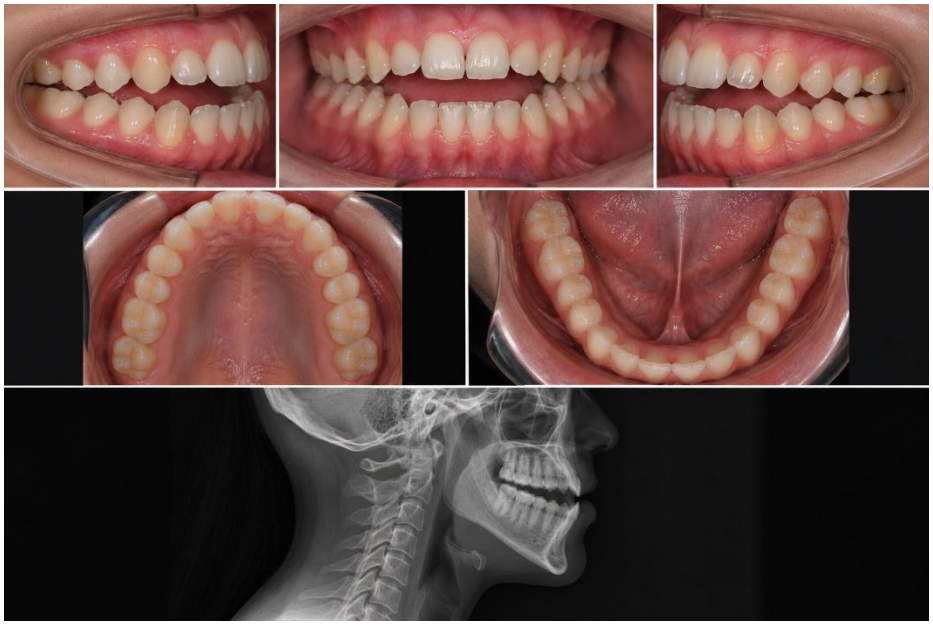
## Case 12

### Orthodontic Data

**SNA:** 82°
**SNB:** 78°
**ANB:** 4°
**SN-GoGn:** 40° (high angle)
**Maxillary arch crowding/spacing:** ≈2 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈2 mm of mild crowding
**U1-SN:** 106°
**IMPA:** 94°
**Overjet:** 3 mm
**Overbite:** −3 mm (anterior open bite)
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Mild maxillary arch constriction.
**Additional relevant clinical finding:** Hyperdivergent pattern, increased lower facial height, and anterior open bite; no history of parafunction or tongue-related habits has been specified.

### Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Maxillary molar intrusion using non-extraction fixed orthodontic treatment is planned.



## Case 13

### Orthodontic Data

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 25° (low angle)
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈2 mm of mild crowding
**U1-SN:** 100°
**IMPA:** 88°
**Overjet:** 3 mm
**Overbite:** 6 mm (deep bite)
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Isolated deep bite with reduced lower facial height and a pronounced curve of Spee.

### Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support (preserved in all regions).
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Selective mandibular incisor intrusion using non-extraction fixed orthodontic treatment is planned.



## Case 14

### Orthodontic Data

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈3 mm of asymmetric crowding
**Mandibular arch crowding/spacing:** ≈2 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 3 mm
**Overbite:** 3 mm
**Right molar relationship:** Class I
**Left molar relationship:** Half-unit Class II
**Right canine relationship:** Class I
**Left canine relationship:** Class II
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Maxillary midline shifted approximately 2 mm to the right; dental asymmetry predominantly associated with left-sided space deficiency. No history of premature primary tooth loss has been specified.

### Periodontal Data

**Periodontal inflammation status:** Clinically stable following initial periodontal treatment; low levels of bleeding on probing and no pockets ≥6 mm.

**Gingival phenotype:** Thick phenotype.

**Periodontal support/attachment:** Localized interdental clinical attachment loss of 3–4 mm; moderately reduced periodontal support.

**Alveolar bone status:** Approximately 15–25% horizontal bone loss in posterior regions, limited to the coronal third of the root; no vertical defects.

**Gingival recession:** Localized recession of 1–2 mm in posterior regions.

**Keratinized tissue:** Generally adequate.

**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned for molar distalization in the left maxillary posterior region.



## Case 15

### Orthodontic Data

**SNA:** 82°

**SNB:** 79°

**ANB:** 3°

**SN-GoGn:** 32°

**Maxillary arch crowding/spacing:** ≈2 mm of mild crowding

**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding

**U1-SN:** 105°

**IMPA:** 93°

**Overjet:** 5 mm

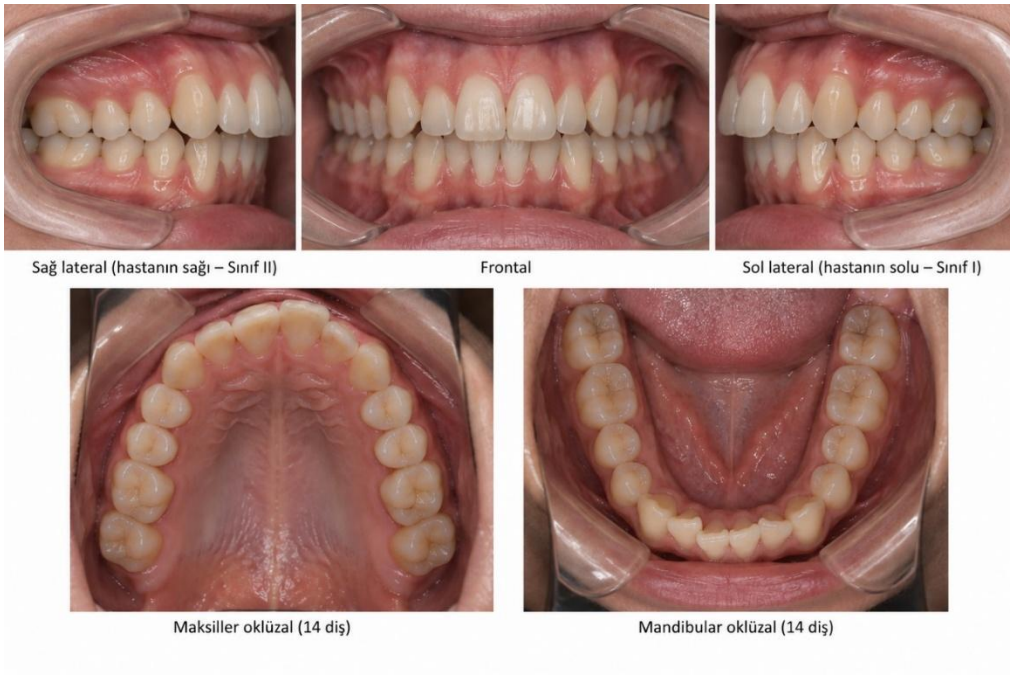
**Overbite:** 3 mm

**Right molar relationship:** Class II

**Left molar relationship:** Class I
**Right canine relationship:** Class II
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship; mandibular midline shifted to the right.
**Additional relevant clinical finding:** Class II on the right and Class I on the left (subdivision); asymmetric sagittal relationship.

### Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to correct the mandibular dental midline and right Class II relationship using asymmetric Class II elastic mechanics.




## Case 16

### Orthodontic Data

**SNA:** 82°
**SNB:** 81°
**ANB:** 1°
**SN-GoGn:** 34°
**Maxillary arch crowding/spacing:** ≈2 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈5 mm of moderate crowding
**U1-SN:** 102°
**IMPA:** 90°

**Overjet:** 2 mm
**Overbite:** 2 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mandibular anterior space deficiency; periodontal variables in the mandibular incisor region determine the limits of tooth positioning.

### Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable (no inflammation).
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Adequate but limited support.
**Alveolar bone status:** Labial alveolar bone at the mandibular incisors appears thin (consistent with the clinical thin phenotype; CBCT has not been specified for definitive measurement).
**Gingival recession:** Localized gingival recession in the mandibular central incisor region (31/41), approximately 2 mm on clinical examination, consistent with Cairo RT1.
**Keratinized tissue:** Reduced width in the mandibular anterior region (≈1.5 mm).
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 17

### Orthodontic Data

**SNA:** 80°
**SNB:** 84°
**ANB:** −4°

**SN-GoGn:** 30°

**Maxillary arch crowding/spacing:** ≈3 mm of mild crowding

**Mandibular arch crowding/spacing:** ≈4 mm of moderate crowding

**U1-SN:** 110°

**IMPA:** 82°

**Overjet:** −2 mm

**Overbite:** 2 mm

**Right molar relationship:** Class III

**Left molar relationship:** Class III

**Right canine relationship:** Class III

**Left canine relationship:** Class III

**Transverse finding:** Mild maxillary transverse constriction.

**Additional relevant clinical finding:** Age: 22 years; growth is complete. Skeletal Class III with pronounced dental compensation; mandibular incisors are already markedly retroclined, and mandibular anterior alveolar boundaries are relevant.

### Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable; no bleeding on probing.

**Gingival phenotype:** Thin phenotype.

**Periodontal support/attachment:** No interproximal attachment loss; pronounced attachment loss limited to the buccal surfaces of teeth 31 and 41.

**Alveolar bone status:** Interproximal bone levels are preserved; the labial alveolar boundary of the mandibular incisors appears thin, and three-dimensional imaging has not been specified.

**Gingival recession:** Buccal gingival recession of 4–5 mm at teeth 31 and 41; interproximal attachment is preserved, consistent with Cairo RT1.

**Keratinized tissue:** Markedly reduced at teeth 31 and 41; approximately 1 mm.

**Orthodontic treatment plan:** Fixed orthodontic treatment is planned to achieve presurgical dental decompensation through mandibular incisor proclination and maxillary incisor retroclination, followed by orthognathic surgery to correct the skeletal Class III relationship.



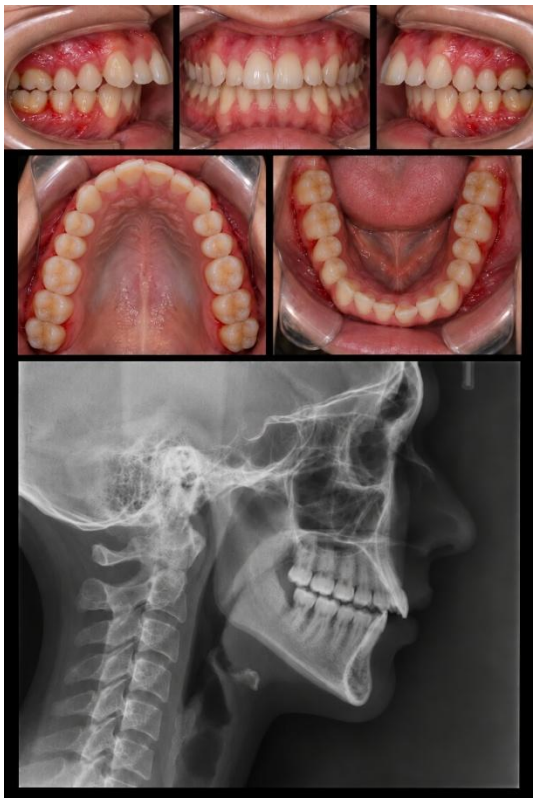
## Case 18

### Orthodontic Data

**SNA:** 83°
**SNB:** 78°
**ANB:** 5°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈3 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈2 mm of mild crowding
**U1-SN:** 106°
**IMPA:** 94°
**Overjet:** 6 mm
**Overbite:** 4 mm
**Right molar relationship:** Class II
**Left molar relationship:** Class II
**Right canine relationship:** Class II
**Left canine relationship:** Class II
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Age: 24 years; growth is complete. Class II sagittal relationship associated with mandibular retrognathia.

## Periodontal Data

**Periodontal inflammation status:** Active periodontal inflammation; bleeding on probing and multiple 5–6 mm periodontal pockets in posterior regions.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Interdental clinical attachment loss of 3–4 mm; moderately reduced periodontal support.
**Alveolar bone status:** Approximately 20–30% horizontal bone loss in posterior regions, limited to the coronal third of the root, with a localized angular defect.
**Gingival recession:** Localized recession of 1–2 mm in posterior buccal regions.
**Keratinized tissue:** Generally adequate.
**Orthodontic treatment plan:** Fixed orthodontic treatment involving extraction of teeth 14 and 24 is planned, using extraction spaces to retract the maxillary anterior teeth and correct the Class II relationship through dental camouflage.



## Case 19

### Orthodontic Data

**SNA:** 85°
**SNB:** 82°
**ANB:** 3°
**SN-GoGn:** 33°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈1 mm of mild crowding
**U1-SN:** 116°
**IMPA:** 102°
**Overjet:** 5 mm
**Overbite:** 2 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Pronounced bimaxillary dentoalveolar protrusion and lip protrusion; anterior positioning and anchorage control are relevant. Age: 21 years.

### Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable; no bleeding on probing.
**Gingival phenotype:** Thin phenotype.

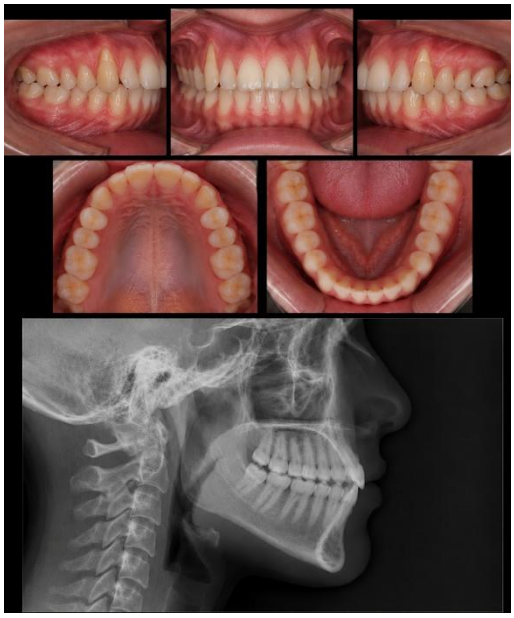
**Periodontal support/attachment:** No interproximal attachment loss; attachment loss limited to the buccal surfaces of multiple teeth between 13 and 23.

**Alveolar bone status:** Interproximal bone levels are preserved; anterior labial alveolar boundaries appear clinically thin, and imaging for definitive bone thickness has not been specified.

**Gingival recession:** Buccal gingival recession of 3–4 mm at teeth 13, 12, 22, and 23; interproximal attachment is preserved, consistent with Cairo RT1.

**Keratinized tissue:** Limited to 1–2 mm at some sites in the maxillary anterior region.

**Orthodontic treatment plan:** Fixed orthodontic treatment involving extraction of four premolars (14, 24, 34, and 44) is planned, using extraction spaces for incisor retraction and retroclination.



## Case 20

### Orthodontic Data

**SNA:** 81°

**SNB:** 79°

**ANB:** 2°

**SN-GoGn:** 34°

**Maxillary arch crowding/spacing:** ≈6 mm of moderate crowding

**Mandibular arch crowding/spacing:** ≈2 mm of mild crowding

**U1-SN:** 103°

**IMPA:** 92°

**Overjet:** 3 mm

**Overbite:** 2 mm

**Right molar relationship:** Class I

**Left molar relationship:** Class I

**Right canine relationship:** Class I

**Left canine relationship:** Class I

**Transverse finding:** Tendency toward bilateral posterior crossbite; maxillary constriction.

**Additional relevant clinical finding:** Age: 15 years; advanced skeletal maturation (relevant to the choice of transverse treatment approach). Thin buccal phenotype in the posterior region.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable.

**Gingival phenotype:** Thin phenotype.

**Periodontal support/attachment:** Adequate support.

**Alveolar bone status:** Posterior buccal alveolar bone appears thin (consistent with the clinical thin phenotype; CBCT has not been specified).

**Gingival recession:** None.

**Keratinized tissue:** Adequate.

**Orthodontic treatment plan:** Rapid maxillary expansion is planned to correct maxillary transverse constriction.



## Case 21

**Orthodontic Data**

**SNA:** 82°

**SNB:** 79°

**ANB:** 3°

**SN-GoGn:** 31°

**Maxillary arch crowding/spacing:** ≈4 mm of moderate crowding

**Mandibular arch crowding/spacing:** ≈2 mm of mild crowding

**U1-SN:** 104°

**IMPA:** 93°

**Overjet:** 5 mm

**Overbite:** 3 mm

**Right molar relationship:** Half-unit Class II

**Left molar relationship:** Half-unit Class II
**Right canine relationship:** Half-unit Class II
**Left canine relationship:** Half-unit Class II
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Half-unit Class II; no pronounced maxillary incisor protrusion. Maxillary molar position is relevant to sagittal correction options.

### Periodontal Data

**Periodontal inflammation status:** Generalized plaque-induced gingival inflammation with bleeding on probing.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support; no clinical attachment loss.
**Alveolar bone status:** Radiographically preserved bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to correct the Class II relationship through maxillary molar distalization.



## Case 22

### Orthodontic Data

**SNA:** 83°
**SNB:** 80°
**ANB:** 3°
**SN-GoGn:** 30°
**Maxillary arch crowding/spacing:** ≈4 mm of spacing
**Mandibular arch crowding/spacing:** ≈1 mm of mild crowding
**U1-SN:** 112°
**IMPA:** 95°
**Overjet:** 6 mm
**Overbite:** 3 mm
**Right molar relationship:** Class I

**Left molar relationship:** Class I

**Right canine relationship:** Class I

**Left canine relationship:** Class I

**Transverse finding:** Normal transverse relationship

**Additional relevant clinical finding:** Maxillary incisor proclination, midline diastema, and generalized maxillary spacing; anterior positioning is relevant.

### Periodontal Data

**Periodontal inflammation status:** Localized active periodontal inflammation; bleeding on probing and 5 mm pockets in the maxillary anterior region.

**Gingival phenotype:** Thick phenotype.

**Periodontal support/attachment:** Localized interdental clinical attachment loss of 3 mm around teeth 11 and 21.

**Alveolar bone status:** Localized horizontal bone loss around teeth 11 and 21, limited to the coronal third of the root.

**Gingival recession:** Buccal recession of 2 mm at tooth 11.

**Keratinized tissue:** Generally adequate.

**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to close maxillary arch spaces through maxillary incisor retroclination/retraction.



## Case 23

### Orthodontic Data

**SNA:** 82°

**SNB:** 80°

**ANB:** 2°

**SN-GoGn:** 32°

**Maxillary arch crowding/spacing:** ≈4 mm of moderate crowding

**Mandibular arch crowding/spacing:** ≈5 mm of moderate crowding

**U1-SN:** 103°

**IMPA:** 93°

**Overjet:** 3 mm

**Overbite:** 3 mm

**Right molar relationship:** Class I

**Left molar relationship:** Class I

**Right canine relationship:** Class I

**Left canine relationship:** Class I

**Transverse finding:** Normal transverse relationship

**Additional relevant clinical finding:** Adult; orthodontic presentation of Class I crowding. The current periodontal condition is a clinically decisive variable.

## Periodontal Data

**Periodontal inflammation status:** Findings consistent with active inflammation: generalized gingival erythema and edema, and widespread increased bleeding on probing.

**Gingival phenotype:** Thick phenotype.

**Periodontal support/attachment:** No pronounced clinical attachment loss.

**Alveolar bone status:** Radiographically preserved bone levels.

**Gingival recession:** None.

**Keratinized tissue:** Adequate.

**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 24

### Orthodontic Data

**SNA:** 83°

**SNB:** 79°

**ANB:** 4°

**SN-GoGn:** 35°

**Maxillary arch crowding/spacing:** ≈4 mm of maxillary anterior spacing (pathological migration)

**Mandibular arch crowding/spacing:** ≈2 mm of mild crowding

**U1-SN:** 110°

**IMPA:** 92°

**Overjet:** 6 mm

**Overbite:** 5 mm

**Right molar relationship:** Class I

**Left molar relationship:** Class I

**Right canine relationship:** Class I

**Left canine relationship:** Class I

**Transverse finding:** Normal transverse relationship

**Additional relevant clinical finding:** Age: approximately 45 years. Pathological migration and secondary spacing of the maxillary anterior teeth; periodontal support determines anterior positioning.

### Periodontal Data

**Periodontal inflammation status:** Inflammation largely controlled/stabilized following periodontal treatment.

**Gingival phenotype:** Thin phenotype.

**Periodontal support/attachment:** Widespread reduction in periodontal support; generalized clinical attachment loss.

**Alveolar bone status:** Widespread horizontal alveolar bone loss (radiographically approximately one-third of root length).

**Gingival recession:** Widespread localized recession.

**Keratinized tissue:** Reduced at some sites.

**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to close maxillary arch spaces through maxillary incisor retraction/retroclination and to achieve mandibular incisor intrusion.



## Case 25

### Orthodontic Data

**SNA:** 82°
**SNB:** 81°
**ANB:** 1°
**SN-GoGn:** 33°
**Maxillary arch crowding/spacing:** ≈2 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈4 mm of moderate crowding
**U1-SN:** 102°
**IMPA:** 96°
**Overjet:** 2 mm
**Overbite:** 2 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** CBCT assessment revealed dehiscence of the labial cortical plate at the mandibular central incisor (41) (imaging modality: CBCT). The mandibular incisors are already slightly proclined.

### Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Adequate clinical attachment; however, labial bone support is reduced.
**Alveolar bone status:** CBCT-confirmed dehiscence of the labial cortical plate at tooth 41.
**Gingival recession:** Incipient recession at tooth 41.
**Keratinized tissue:** Reduced width in the mandibular anterior region.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 26

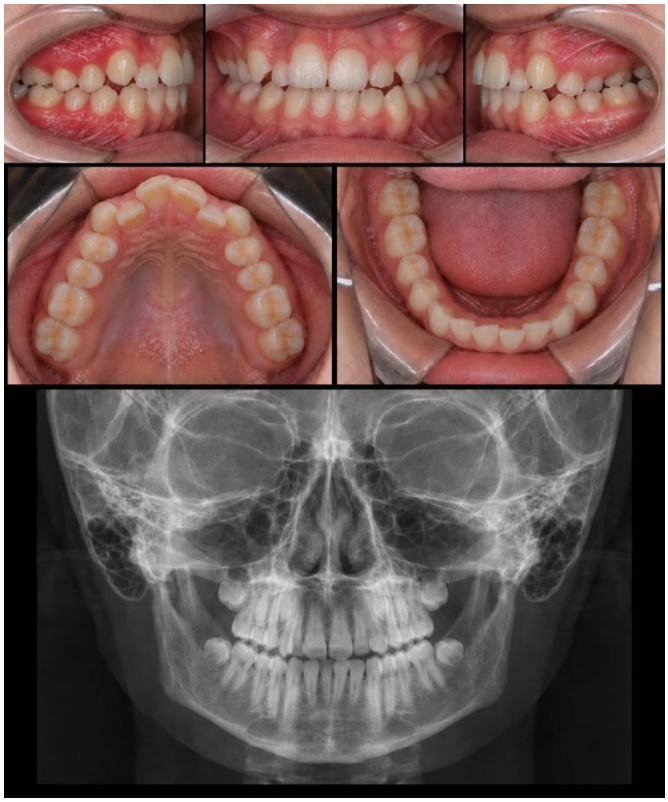
### Orthodontic Data

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 32°
**Maxillary arch crowding/spacing:** ≈4 mm of moderate crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 91°
**Overjet:** 3 mm
**Overbite:** 3 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Left unilateral posterior crossbite; functional mandibular shift with leftward deviation of the mandibular midline on closure.
**Additional relevant clinical finding:** Age: 10 years; active growth period. The apparent asymmetry may be functional in origin.

### Periodontal Data

**Periodontal inflammation status:** Localized plaque-induced gingival inflammation with bleeding on probing in the posterior region on the crossbite side.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate support; no clinical attachment loss.
**Alveolar bone status:** Radiographically preserved bone levels.

**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Rapid maxillary expansion is planned to correct maxillary transverse constriction.



## Case 27

### Orthodontic Data

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈5 mm of moderate crowding
**Mandibular arch crowding/spacing:** ≈4 mm of moderate crowding
**U1-SN:** 103°
**IMPA:** 94°
**Overjet:** 3 mm
**Overbite:** 3 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Borderline profile with respect to space-gaining strategy; limits of tooth positioning are clinically relevant because of the thin phenotype.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Adequate support.
**Alveolar bone status:** Radiographically normal bone levels (thin biotype).
**Gingival recession:** None.
**Keratinized tissue:** Adequate but borderline.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 28

**Orthodontic Data**

**SNA:** 83°
**SNB:** 78°
**ANB:** 5°
**SN-GoGn:** 32°
**Maxillary arch crowding/spacing:** ≈3 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 107°
**IMPA:** 93°
**Overjet:** 6 mm
**Overbite:** 4 mm
**Right molar relationship:** Class II
**Left molar relationship:** Class II
**Right canine relationship:** Class II
**Left canine relationship:** Class II
**Transverse finding:** Normal transverse relationship

**Additional relevant clinical finding:** Adult. Localized periodontal problems in the molar regions in addition to a Class II sagittal relationship; the current periodontal condition is clinically decisive.

### Periodontal Data

**Periodontal inflammation status:** Localized findings consistent with active inflammation in molar regions: bleeding on probing and increased probing depths.

**Gingival phenotype:** Thick phenotype.

**Periodontal support/attachment:** Localized clinical attachment loss and reduced support (in the affected region).

**Alveolar bone status:** Localized bone loss in affected molar regions (radiographically approximately one-third of root length).

**Gingival recession:** Localized recession on buccal surfaces of molars.

**Keratinized tissue:** Generally adequate.

**Orthodontic treatment plan:** Fixed orthodontic treatment involving extraction of two maxillary premolars is planned to retract the maxillary anterior teeth and correct the Class II relationship through dental camouflage.



## Case 29

### Orthodontic Data

**SNA:** 82°

**SNB:** 80°

**ANB:** 2°

**SN-GoGn:** 30°

**Maxillary arch crowding/spacing:** ≈2 mm of mild crowding

**Mandibular arch crowding/spacing:** ≈2 mm of mild crowding

**U1-SN:** 102°

**IMPA:** 90°

**Overjet:** 3 mm

**Overbite:** 3 mm

**Right molar relationship:** Class I

**Left molar relationship:** Class I

**Right canine relationship:** Class I

**Left canine relationship:** Class I

**Transverse finding:** Normal transverse relationship

**Additional relevant clinical finding:** Relative infraposition of the maxillary right central incisor and gingival margin discrepancy; vertical level discrepancy in the esthetic region. The incisal/gingival level relationship is relevant.

## Periodontal Data

**Periodontal inflammation status:** Clinically healthy/stable; no bleeding on probing.

**Gingival phenotype:** Thin phenotype.

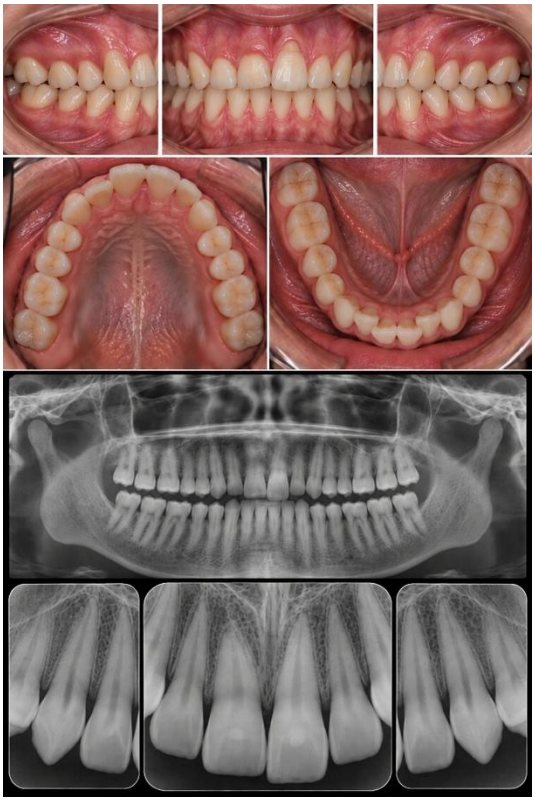
**Periodontal support/attachment:** No interproximal attachment loss; attachment loss limited to the buccal surface of tooth 21.

**Alveolar bone status:** Interproximal bone levels are preserved; gingival/bone level asymmetry in the maxillary anterior region.

**Gingival recession:** Buccal gingival recession of 3 mm at tooth 21; interproximal attachment is preserved, consistent with Cairo RT1.

**Keratinized tissue:** Limited to approximately 1.5 mm at tooth 21.

**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 30

### Orthodontic Data

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 33°
**Maxillary arch crowding/spacing:** ≈6 mm of moderate-to-severe crowding
**Mandibular arch crowding/spacing:** ≈6 mm of moderate-to-severe crowding
**U1-SN:** 104°
**IMPA:** 93°
**Overjet:** 3 mm
**Overbite:** 3 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Adult. Pronounced space deficiency in both arches; reduced periodontal support of posterior teeth is directly relevant to anchorage planning.

### Periodontal Data

**Periodontal inflammation status:** Stable following periodontal treatment.
**Gingival phenotype:** Thin-to-intermediate phenotype.
**Periodontal support/attachment:** Localized reduced support in the posterior region.
**Alveolar bone status:** Localized horizontal bone loss in molar regions (radiographically approximately one-quarter to one-third of root length).
**Gingival recession:** Localized posterior recession.
**Keratinized tissue:** Adequate.
**Orthodontic treatment plan:** Fixed orthodontic treatment involving extraction of four premolars is planned, with extraction space closure and dental alignment using moderate anchorage.



## Case 31

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Normal/adequate; no clinical attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.

**Keratinized tissue:** Adequate.
**Mucogingival finding:** Maxillary labial frenum with a high coronal insertion in the maxillary anterior region, terminating close to the papillary region between the central incisors.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 32

**Orthodontic Data**
**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.
**Periodontal Data**
**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thin phenotype.

**Periodontal support/attachment:** Adequate; no clinical attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate in the maxillary anterior region.
**Mucogingival finding:** Maxillary labial frenum with a high coronal insertion in the maxillary anterior region, associated with a thin and more delicate gingival margin.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 33

**Orthodontic Data**
**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thick phenotype.
**Periodontal Data**
**Periodontal support/attachment:** Normal/adequate; no clinical attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Mucogingival finding:** Maxillary labial frenum with a high coronal insertion in the maxillary anterior region, terminating close to the papillary region between the central incisors.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 34

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Adequate; no clinical attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate in the maxillary anterior region.
**Mucogingival finding:** Maxillary labial frenum with a high coronal insertion in the maxillary anterior region, associated with a thin and more delicate gingival margin.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.




## Case 35

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Adequate; no attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate in the mandibular anterior region.

**Mucogingival finding:** Shallow vestibular sulcus in the mandibular anterior region; the mucogingival junction is relatively close to the gingival margin.

**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 36

**Orthodontic Data**

**SNA:** 82°

**SNB:** 80°

**ANB:** 2°

**SN-GoGn:** 31°

**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding

**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding

**U1-SN:** 103°

**IMPA:** 92°

**Overjet:** 2.5 mm

**Overbite:** 2.5 mm

**Right/left molar relationship:** Class I

**Right/left canine relationship:** Class I

**Transverse finding:** Normal transverse relationship

**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable.

**Gingival phenotype:** Thin phenotype.

**Periodontal support/attachment:** Adequate; no clinical attachment loss.

**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate in the mandibular anterior region.
**Mucogingival finding:** Markedly shallow mandibular anterior vestibule; the mucogingival junction is close to the gingival margin, associated with a thin phenotype.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 37

**Orthodontic Data**
**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I

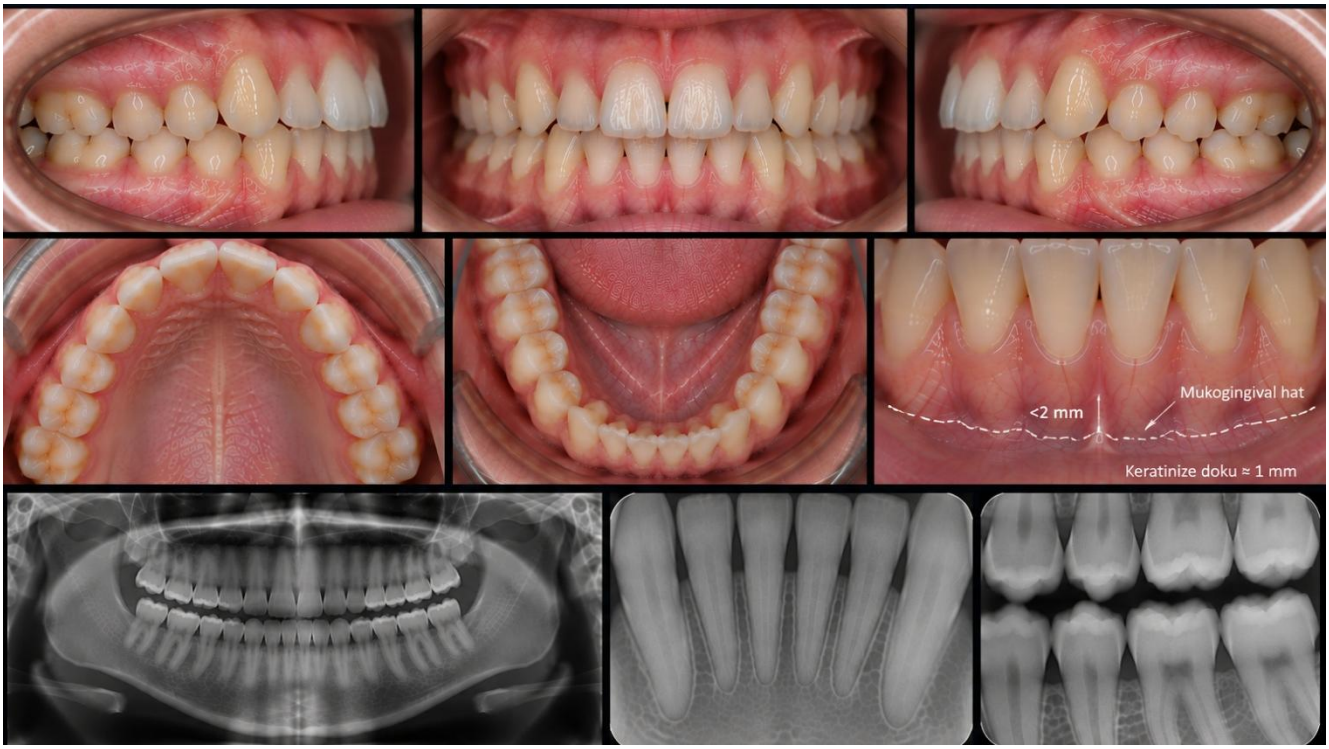
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.
**Periodontal Data**
**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Normal/adequate; no clinical attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Locally reduced in the mandibular anterior region; approximately 2 mm.
**Mucogingival finding:** Reduced band of keratinized tissue on the labial aspect of the mandibular incisors; however, tissue thickness is clinically consistent with a thick phenotype.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 38

**Orthodontic Data**
**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm

**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.
**Periodontal Data**
**Periodontal inflammation status:** Clinically healthy/stable.
**Gingival phenotype:** Thin phenotype.
**Periodontal support/attachment:** Adequate; no existing clinical attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Markedly reduced in the mandibular anterior region, <2 mm (approximately 1–1.5 mm).
**Mucogingival finding:** Narrow band of keratinized tissue and thin gingival margin on the labial aspect of the mandibular incisors.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



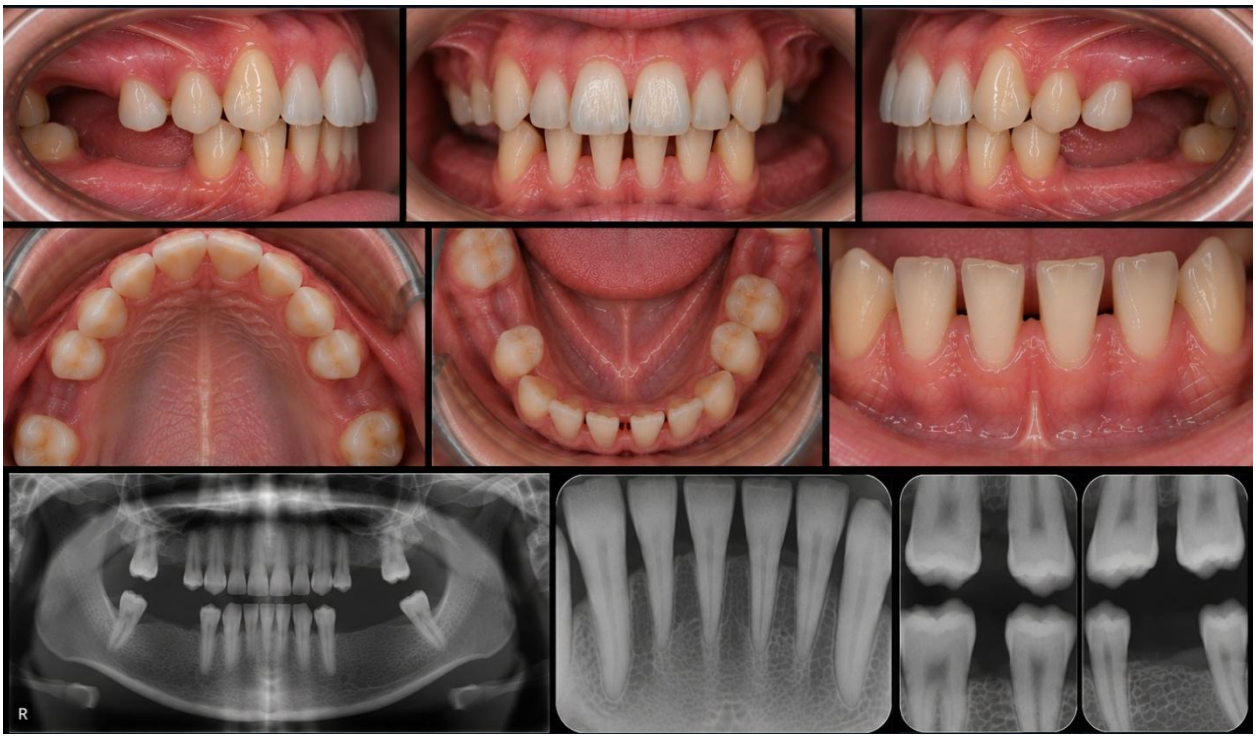

## Case 39

**Orthodontic Data**
**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°

**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal Data**

**Periodontal inflammation status:** Clinically healthy/stable appearance; no gingival erythema or edema. No bleeding on probing.
**Gingival phenotype:** Thick phenotype.
**Periodontal probing depth:** No pathological periodontal pockets detected; probing depths are within physiological limits.
**Periodontal support/attachment:** Despite the absence of clinical signs of active inflammation, reduced periodontal support consistent with radiographic bone loss is present.
**Alveolar bone status:** Radiographically pronounced alveolar bone loss, particularly in first molar and incisor regions. The extent of bone loss is disproportionate to the minimal clinical signs of inflammation.
**Gingival recession:** None.
**Keratinized tissue:** Adequate.
**Family/periodontal history:** Family history/predisposition to pronounced periodontal bone loss at an early age.
**Relevant periodontal clinical finding:** The gingiva appears clinically healthy; despite the absence of bleeding, pronounced inflammation, and pathological pockets, advanced radiographic loss of periodontal support is evident. Periodontal assessment of the potential for rapid progression is important because of familial predisposition and radiographic bone loss disproportionate to clinical findings.
**Orthodontic treatment plan:** Fixed orthodontic treatment is planned to achieve dental alignment and leveling while maintaining the existing posterior edentulous spaces.




## Case 40

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.
**Periodontal inflammation status:** Active periodontal inflammation with pronounced gingival erythema, edema, and bleeding on probing, particularly in incisor and first molar regions.
**Gingival phenotype:** Thick phenotype.

**Periodontal Data**

**Periodontal probing depth:** Increased probing depths and localized periodontal pockets in incisor and first molar regions.
**Periodontal support/attachment:** Pronounced clinical attachment loss and reduced periodontal support, particularly in incisor and first molar regions.

**Alveolar bone status:** Radiographically pronounced alveolar bone loss disproportionate to the patient's age, particularly in first molar and incisor regions.
**Gingival recession:** No pronounced recession.
**Keratinized tissue:** Adequate.
**Family/periodontal history:** Family history/predisposition to pronounced periodontal bone loss at an early age.
**Relevant periodontal clinical finding:** Active inflammation, bleeding on probing, periodontal pockets, and attachment loss in incisor and first molar regions, with pronounced radiographic alveolar bone loss. Familial predisposition and pronounced early periodontal destruction indicate a periodontal presentation at high risk of rapid progression.
**Orthodontic treatment plan:** Fixed orthodontic treatment is planned to achieve dental alignment and leveling while maintaining the existing posterior edentulous spaces.




## Case 41

**Orthodontic Data**

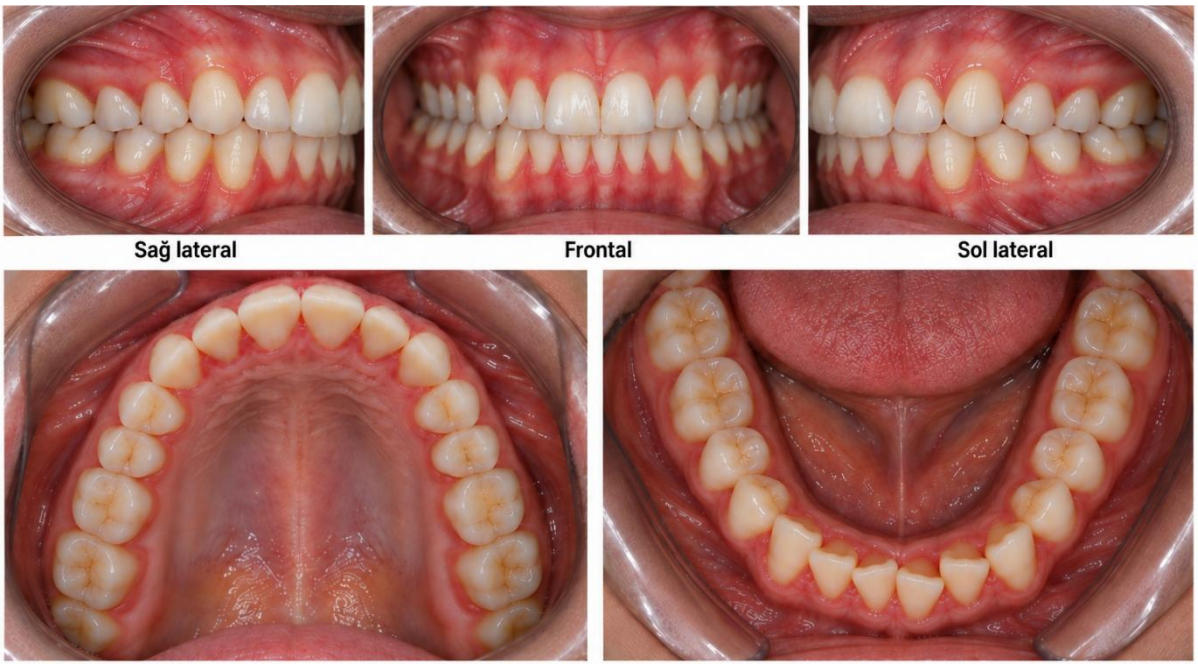
**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I

**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal Data**

**Periodontal inflammation status:** Plaque-induced gingivitis with gingival erythema, edema, and bleeding on probing.
**Gingival phenotype:** Thick phenotype.
**Periodontal support/attachment:** Normal/adequate support; no clinical attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate in all regions.

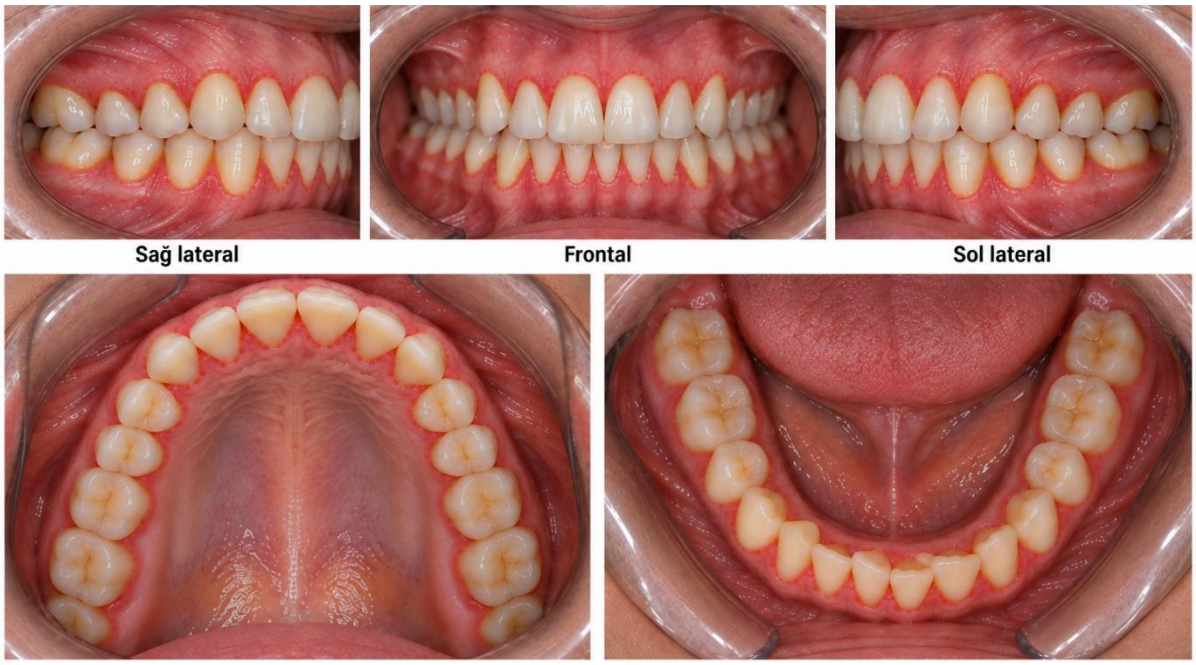
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.




## Case 42

**Orthodontic Data**
**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°

**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.
**Periodontal Data**
**Periodontal inflammation status:** Plaque-induced gingivitis with gingival inflammation and bleeding on probing.
**Gingival phenotype:** Thin gingival phenotype.
**Periodontal support/attachment:** Normal/adequate periodontal support; no clinical attachment loss.
**Alveolar bone status:** Radiographically normal bone levels.
**Gingival recession:** None.
**Keratinized tissue:** Adequate in all regions.
**Oral hygiene and patient compliance:** Oral hygiene is inadequate. Despite previous oral hygiene instruction, plaque control has not improved sufficiently, and the patient has not complied with recommended oral hygiene practices.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.




## Case 43

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.
**Periodontal Data**
**Periodontal inflammation status:** Gingival inflammation with bleeding on probing. Maximum probing depth is 5 mm, with no periodontal pockets ≥6 mm.
**Gingival phenotype:** Thick gingival phenotype.
**Periodontal support/attachment:** Interdental clinical attachment loss of 3–4 mm. No loss of periodontal support severe enough to result in tooth loss.
**Alveolar bone status:** Radiographic horizontal alveolar bone loss (15–33%) limited to the coronal third of the root. No pronounced vertical bone defects.
**Gingival recession:** No pronounced gingival recession.
**Keratinized tissue:** Adequate in all regions.
**Data on periodontitis progression:** Comparison with previous radiographs suggests moderate progression of periodontal destruction over the past 5 years; no findings indicative of rapid progression.
**Additional periodontal findings:** No furcation involvement or tooth loss due to periodontitis.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.




## Case 44

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right/left molar relationship:** Class I
**Right/left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors.

**Periodontal Data**

**Periodontal inflammation status:** Gingival inflammation and bleeding on probing are present. Periodontal pockets ≥6 mm are observed at multiple sites.
**Gingival phenotype:** Thick gingival phenotype.
**Periodontal support/attachment:** Interdental clinical attachment loss ≥5 mm; periodontal support is markedly reduced.

**Alveolar bone status:** Radiographic bone loss extends to the middle third of the root and more apically in some regions. Localized vertical bone defects are present.
**Gingival recession:** Localized mild gingival recession.
**Keratinized tissue:** Generally adequate.
**Additional periodontal findings:** No advanced masticatory dysfunction, severe ridge defect, or need for complex rehabilitation associated with loss of periodontal support.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.



## Case 45

**Orthodontic Data**
**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** Anterior irregularity and spacing associated with loss of periodontal support.

**Mandibular arch crowding/spacing:** Irregularity and pathological tooth migration in the mandibular anterior region.
**U1-SN:** 108°
**IMPA:** 96°
**Overjet:** 4 mm
**Overbite:** 1.5 mm
**Transverse finding:** No pronounced transverse skeletal discrepancy.
**Additional relevant clinical finding:** Pathological tooth migration, anterior spacing, and mobility are present; loss of periodontal support complicates the planning of orthodontic mechanics.
**Periodontal Data**
**Periodontal inflammation status:** Widespread gingival inflammation and bleeding on probing; periodontal pockets ≥6 mm at numerous sites.
**Gingival phenotype:** Thick gingival phenotype.
**Periodontal support/attachment:** Clinical attachment loss ≥5 mm and advanced loss of periodontal support at numerous teeth.
**Alveolar bone status:** Radiographic bone loss extends to the middle third of the root and beyond in many regions; vertical defects are present.
**Gingival recession:** Gingival recession at multiple sites.
**Keratinized tissue:** Generally adequate.
**Additional periodontal findings:** Tooth mobility, pathological tooth migration, and impaired masticatory function associated with advanced loss of periodontal support. The case requires complex multidisciplinary rehabilitation in addition to periodontal stabilization.
**Orthodontic treatment plan:** Fixed orthodontic treatment is planned to close spaces through retraction/retroclination of the maxillary and mandibular incisors.



## Case 46

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal Data**

**Periodontal inflammation status:** Gingival inflammation with bleeding on probing. Maximum probing depth is 5 mm, with no periodontal pockets ≥6 mm.
**Gingival phenotype:** Thick gingival phenotype.
**Periodontal support/attachment:** Interdental clinical attachment loss of 3–4 mm; periodontal support is moderately reduced.
**Alveolar bone status:** Radiographic horizontal alveolar bone loss of approximately 15–33%, limited to the coronal third of the root. No pronounced vertical bone defects.
**Gingival recession:** No pronounced gingival recession.
**Keratinized tissue:** Adequate in all regions.
**Oral hygiene and patient compliance:** Despite previous oral hygiene instruction, plaque control is inadequate. The patient does not regularly perform recommended oral hygiene practices and does not comply with periodontal care recommendations.
**Additional periodontal findings:** No furcation involvement or tooth loss due to periodontitis.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.




## Case 47

**Orthodontic Data**

**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°
**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal Data**

**Periodontal inflammation status:** Gingival inflammation with bleeding on probing. Maximum probing depth is 5 mm, with no periodontal pockets ≥6 mm.

**Gingival phenotype:** Thin gingival phenotype.
**Periodontal support/attachment:** Interdental clinical attachment loss of 3–4 mm; periodontal support is moderately reduced.
**Alveolar bone status:** Radiographic horizontal alveolar bone loss of approximately 15–33%, limited to the coronal third of the root. No pronounced vertical bone defects.
**Gingival recession:** No pronounced gingival recession.
**Keratinized tissue:** Adequate in all regions.
**Oral hygiene and patient compliance:** Despite previous oral hygiene instruction, plaque control is inadequate. The patient does not regularly perform recommended oral hygiene practices and does not comply with periodontal care recommendations.
**Additional periodontal findings:** No furcation involvement or tooth loss due to periodontitis.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.




## Case 48

**Orthodontic Data**
**SNA:** 82°
**SNB:** 80°
**ANB:** 2°
**SN-GoGn:** 31°
**Maxillary arch crowding/spacing:** ≈1 mm of mild crowding
**Mandibular arch crowding/spacing:** ≈3 mm of mild crowding
**U1-SN:** 103°

**IMPA:** 92°
**Overjet:** 2.5 mm
**Overbite:** 2.5 mm
**Right molar relationship:** Class I
**Left molar relationship:** Class I
**Right canine relationship:** Class I
**Left canine relationship:** Class I
**Transverse finding:** Normal transverse relationship
**Additional relevant clinical finding:** Mild rotations of the mandibular incisors; balanced skeletal and dental relationships.

**Periodontal Data**

**Periodontal inflammation status:** Gingival inflammation and bleeding on probing are present. Periodontal pockets ≥6 mm are observed at multiple sites.
**Gingival phenotype:** Thin gingival phenotype.
**Periodontal support/attachment:** Interdental clinical attachment loss ≥5 mm; periodontal support is markedly reduced.
**Alveolar bone status:** Radiographic bone loss extends to the middle third of the root and more apically in some regions; localized vertical bone defects are present.
**Gingival recession:** Localized gingival recession.
**Keratinized tissue:** Reduced keratinized tissue width, particularly in the mandibular anterior region.
**Oral hygiene and patient compliance:** Oral hygiene is moderate; the patient partially complies with periodontal care recommendations.
**Additional periodontal findings:** No advanced masticatory dysfunction or need for complex rehabilitation due to periodontitis.
**Orthodontic treatment plan:** Non-extraction fixed orthodontic treatment is planned to achieve dental alignment and leveling.


Sağ lateral
Frontal
Sol lateral
Üst oklüzal
Alt oklüzal