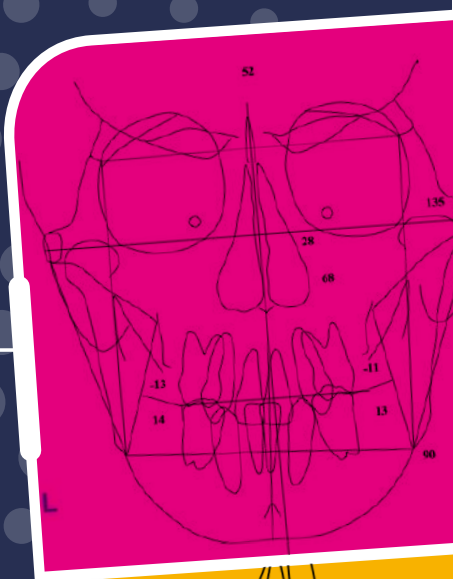
L'ORTHODONTIE BIOPROGRESSIVE
REVIEW N17 – JUNE 2025

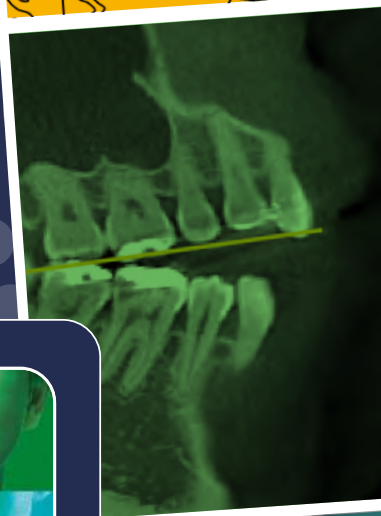
CLINICAL CASES

INTERNATIONAL ISSUE

Discover 10 clinical cases:

- France
- United Arab Emirates
- United Kingdom
- Hungary
- Japan
- Romania
- Vietnam





SBR
SOCIETE BIOPROGRESSIVE RICKETTS

Dear colleague, dear friend,

We've been hard at work producing this beautiful, highly international issue,
as you will see. It allows us to see that beyond words, we can understand each other.

Carl Gugino tells us to look “beyond the teeth” to appreciate the patient as a whole. Seeing that we're treating with the same “bioprogressive concept” is a step in the same direction of thinking and diagnosing serve the same purpose, across all borders.

The first semester of 2025 was marked by our many regional meetings, reflecting the vitality of our Scientific Society. In April, the “universitary seminar” took place in Bordeaux. Bordeaux, bringing together all the Orthodontic residents in France. The SBR supervised the 2nd year residents to treat a case on Electrodont, alternating with lectures.

Thanks to Veronika Dercsar (and her dad Joszef), Romain Poitel, liberal practitioners who devote time to it; thanks to our Universitary staff Delphine Wagner (Strasbourg), Nathalie Foumou and Claire Averland (Lille), Gauthier Dot (Paris), Maxime Rotenberg (Toulouse), Stéphane Renaudin and Marc-Henri Nivet (Nantes), Damien Brezulier (Rennes), Cédric Bazert (Bordeaux). In short, a team!

And now, COLMAR!
We look forward to seeing you at our annual in Colmar on September 12, 13 and 14, on the theme of “Responsible orthodontics responsible orthodontics: commitments for tomorrow”.

We are hearing more and more about the ingestion of microplastics... what if our aligners are contributing to this?
The brain is said to be the organ that accumulates the most microplastics over a lifetime... What should we do with the resins used in 3D printers? These are questions that need to be studied, but there is no need to panic.

The conferences are sure to be fascinating and passionate!
But the East Bureau will undoubtedly help us relax!

Have a great vacation, and see you soon in Alsace.

Patrick
Guézénec
President of the SBR

SUMMARY

International clinical cases

THE SBR TEAM IN BORDEAUX – CLASS OF 2025.

Treatment by functional education and associated multi-bracket

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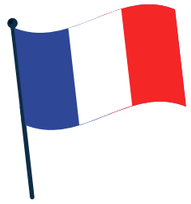


INTRODUCTION

Marius came to my office in January 2012. He was 7 years and 9 months old, and from that first visit, we decided to initiate an awareness training.

As shown in the facial photographs, Marius presents with very significant lower lip sucking, which is responsible for a proclination of the upper incisors. Delaying treatment would be an indisputable loss of chance, with an obvious risk of fracture of those teeth (the edges are already slightly broken).

Even in resting posture, the lower lip is stuck under the upper incisors. I gave him a soft oral screen and explained the exercises he has to practice, pulling it forward and resisting with a lip contraction.

Marius mentioned the mockery at school.

All the data were collected in January 2012: clinical data sheet, buccal and facial photographs, panoramic radiograph, frontal and lateral X-rays.

Fig. 1 à 4
Facial aspects.

FACIAL EXAM

Marius has undue lip disclosure and a bad tongue habit, pushing forward his tongue tip with significant lower lip contraction when swallowing. He has a very gummy smile of 5 mm.

Marius is not aware of his problem, but his mother understands exactly where the issue is, even though she only mentions the **"upper teeth forward"** as the main reason for their consultation. The upper lip is forward, and the mandible appears retrusive.

BUCCAL EXAM

Marius presents with a Class II division 1 malocclusion. He is in mixed dentition with 12 deciduous teeth. The overjet is measured at 14 mm, and the overbite is 90%. There is mild lower crowding of 4 mm and a V-shaped maxilla.

Midlines are centered, and there is space between the upper lateral incisors and deciduous canines on both sides due to tongue pressure.

The TMJs are healthy. Maximum opening is 50 mm, lateral diductions are symmetrical (13 mm), and protrusion reaches 14 mm (edge-to-edge incisors).

RADIOGRAPHIC EXAM

All germs are present, except for the upper wisdom teeth (too young to be visible). Cuspid and premolar germs are well oriented.
The condyles are very short.

Lateral cephalometric analysis (Ricketts) shows a very mesofacial pattern with proclination of the upper incisors. The lower incisors are slightly lingually tipped (18°/A-Pog), but the mandible is positioned posteriorly, with a Pogonion/McNamara line distance of 8 mm. His individualized lower facial height is decreased (41°), as well as the total facial height (55°). The summary of this case is a mesofacial pattern with a retrusive mandible.

Frontal cephalometric analysis (Grummons) reveals a slight maxillary transverse deficiency due to a tongue habit, and this deficiency locks the mandible backward (maxillary width: 53 mm, mandible: 51 mm).

Fig. 5 à 9
Intraoral photos.

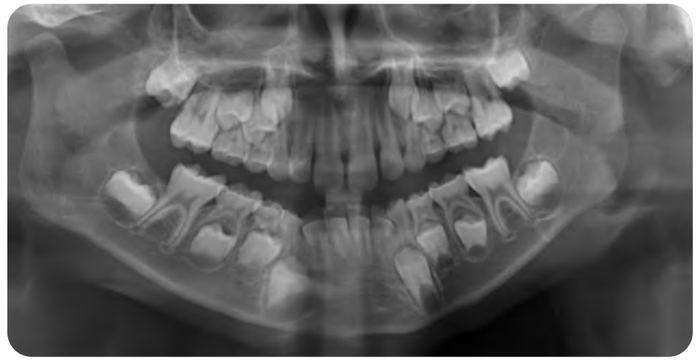
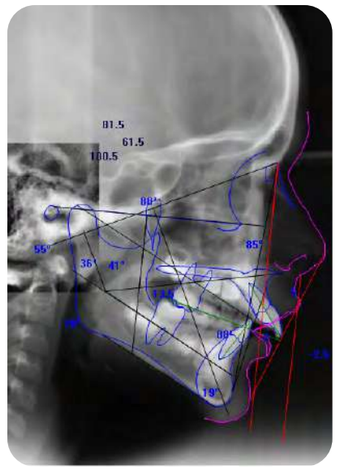


Fig. 10
Panoramic start.



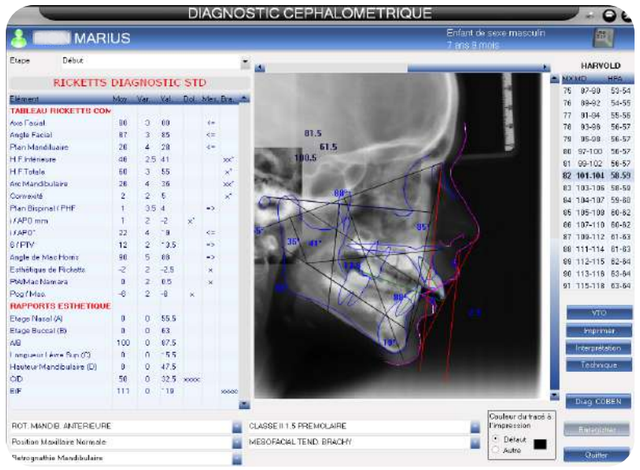
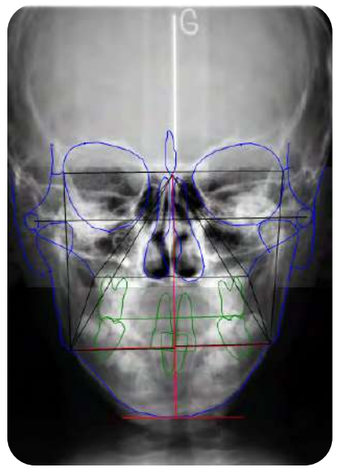


Fig. 11 et 12
Profile cephalometry (Ricketts).



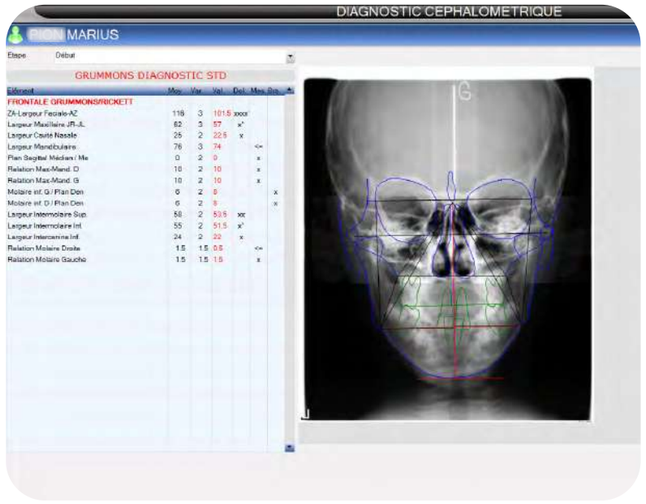
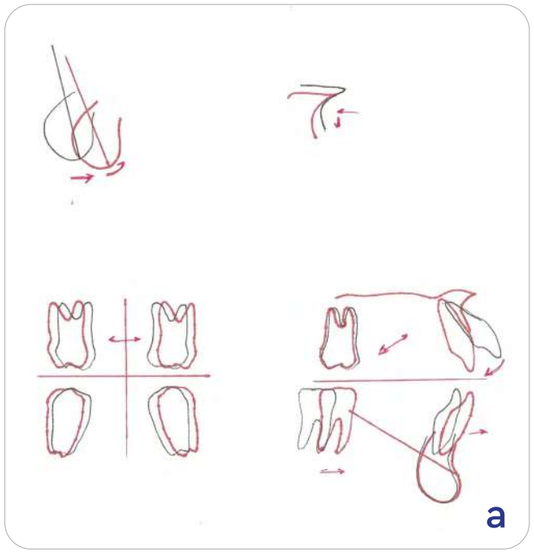


Fig. 13 et 14
Profile cephalometry (Grummons).

VTP shows that we need to retract point A, intrude the upper incisors, and move the mandible and lower denture forward to stimulate growth. Transverse control is also mandatory.

The facial axis is not a key point, and the selected therapeutic arch form is « normal."

Superimpositions: initial/VTP.



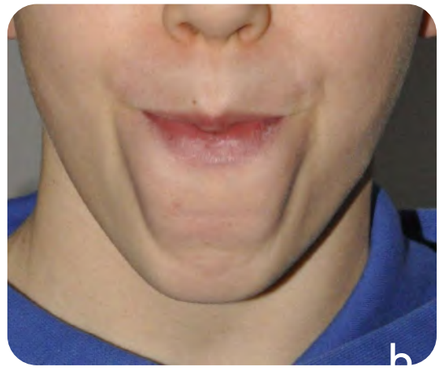


Fig. 15
a. Overlay start.
b. Monkey exercise.

Degree of difficulty of functional matrix is 33+.
DD denture is 2+.
DD skelettal ise 3.
DD of our objectives is 3.

Fig. 16
Bionator.

Treatment Planning

> Awareness training with a soft oral screen and swallowing exercises ("monkey" and bubble exercises: the tongue must pass over the edge of the lower incisors and push on the sublabial furrow).
> Activation of mandibular growth with a Bionator, which can help the forward tipping of the lower incisors.
> Extraction of the first upper premolars can be planned if cooperation is not sufficient.
> Check-up after the first phase and retention with a Hawley plate, wearing a vestibular elastic to increase "rabbiting" and protect these teeth as much as possible.
> Full-mouth bioprogressive bonding and Class II elastics.
> Detailing and finishing.
> Retention.

TREATMENT

Bionator is fixed in june 2012. Marius wears it untill march 2013 Bionator is built in class I relationship.

The Hawley plate is made with a vestibular elastic to allow the buccal sectors to evolve, decreasing the risk of fracture.

Note: A small spot of acrylic is bonded to the upper central incisors, preventing the elastic from moving upward to the gingiva.

Lateral radiography was done in February 2014.

Fig. 17 à 21
Intraoral photos.

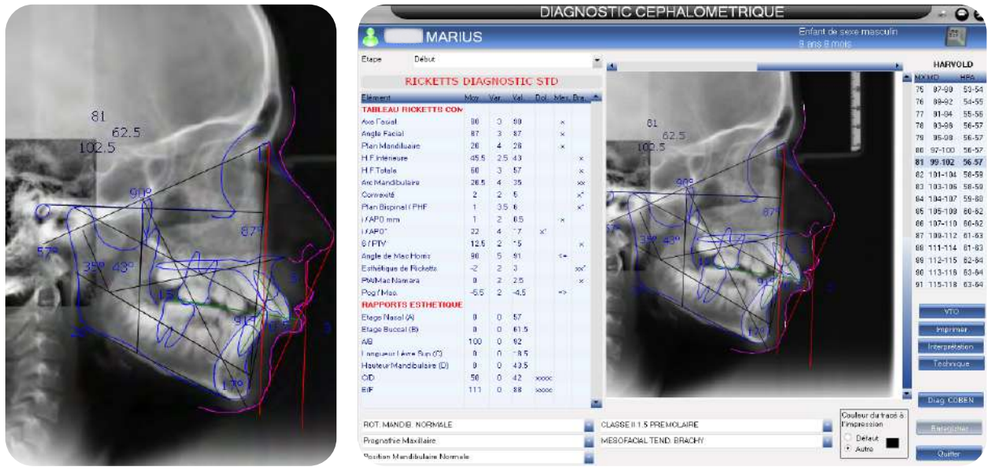


Fig. 22 et 23
Profile cephalometry (Ricketts).

Explanation to the parents to confirm that we don't perform extractions because of the child's cooperation, and we adjust a Quad Helix for 6 months to control molar rotation and transverse dimension.

Fig. 24 à 26
Facial aspects.

Fig. 27 à 31
Intraoral photos.

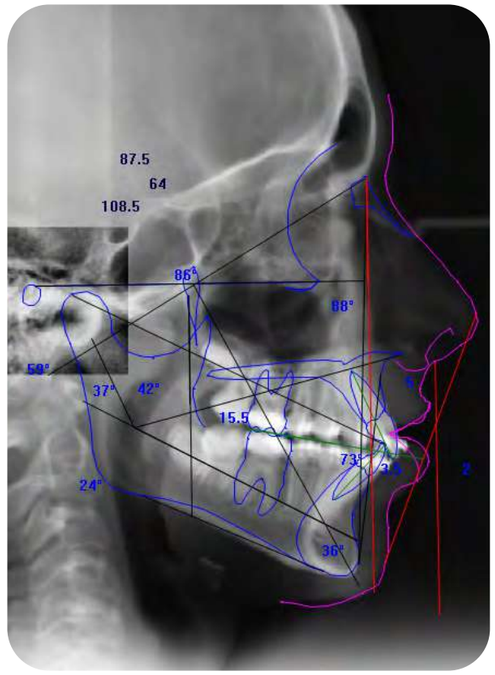


Fig. 32
Lateral teleradiography (Ricketts).

The aesthetics of the face have been significantly improved, even though we still observe lip contraction when swallowing.

The upper arch was fully bonded in November 2014, and the lower arch in January 2015.

Upper utility arch in blue Elgiloy 16x22 with control of lingual torque on buccal sectionals. Mandibular utility arch in blue Elgiloy 16x16 with piggyback continuous arch in .018.

Class II elastics were initiated in May 2015.

Check-up in October 2015.

Finishing wires with classe II elastics at night. Debounding in July 2016, and print for elasto-finisher.

As patient cooperation was really good, we decided to make an elastopositioner in September 2016. A spring retainer was made in February 2018 to correct a slight rotation of the lower right lateral, followed by bonding a fixed retention wire between the lower cuspids.

Marius was monitored until February 2019 (wisdom teeth extractions were counseled).

Fig. 33 à 35
Facial aspects.

Fig. 36 à 38
Restraint prints.

Fig. 39 à 43
Intraoral photos.

Fig. 44 à 46
Face in restraint.

Treatment with the growth activator lasted 9 months (6 appointments).
Then, suspension for 1 year.

Awareness training was still in progress during those 2 years.

Fixed appliances were in place for 2 years.

Retention lasted 3 years (including 6 months with elastodontics).

The total treatment for Marius lasted [insert number] years, from the first visit to the last one.

RESULTS

The Harvold triangle, measured at the retention phase, shows a lengthening of the mandible by 10mm.

Our objectives were achieved with slight bipro-version, which is quite acceptable considering Marius is 12 years old.

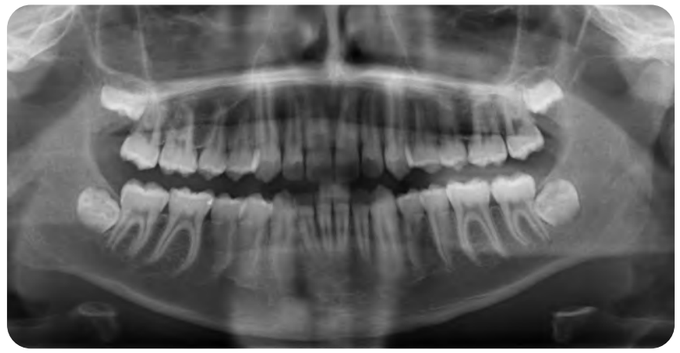


Fig. 47
Final panoramic.

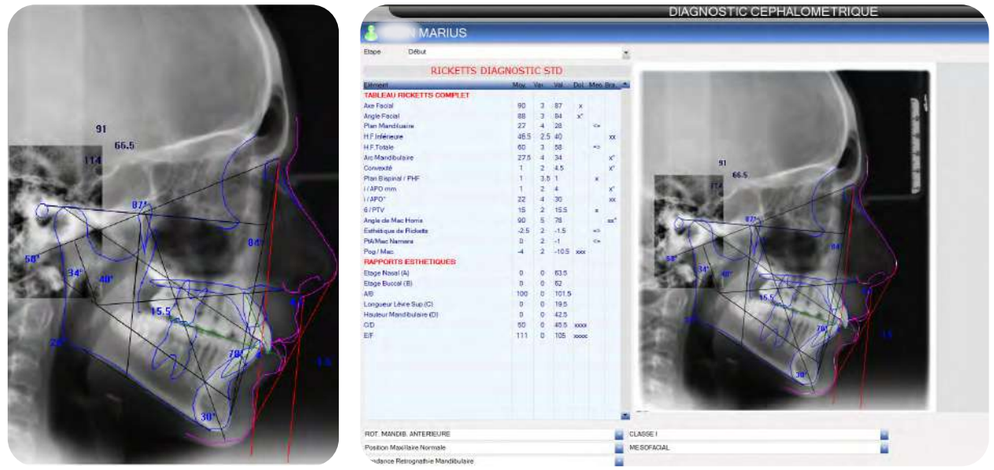
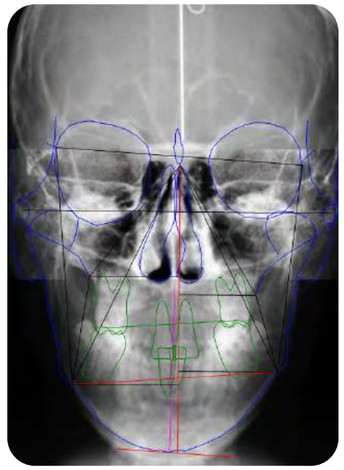


Fig. 48 et 49
Profile cephalometry (Ricketts).



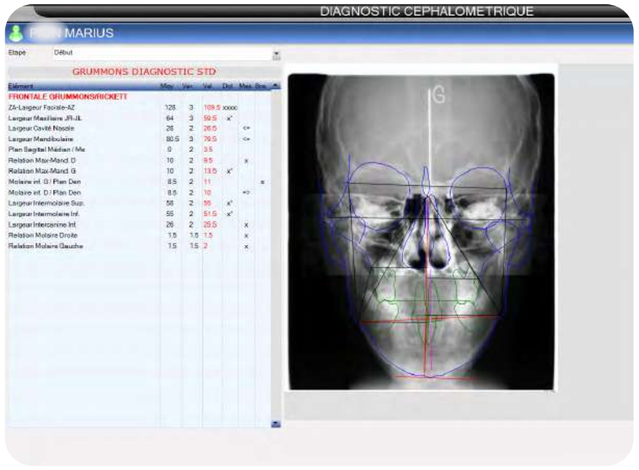


Fig. 50 et 51
Frontal cephalometry (Grummons).

Overjet has been reduced from 14mm to 3mm, and overbite is corrected.
Do we need to propose treatment with 4 extractions, with the risk of decreasing the "tongue box"?

Remaining growth and nasal growth are expected to reduce the protrusion of the lip.

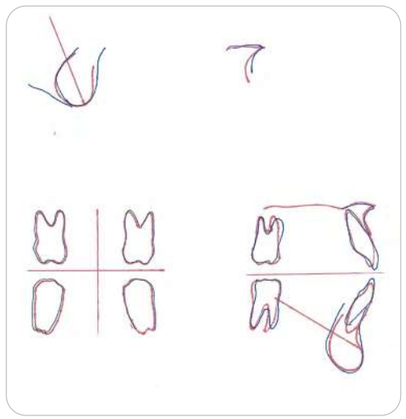


Fig. 52
Début/fin + superposition début VTP.

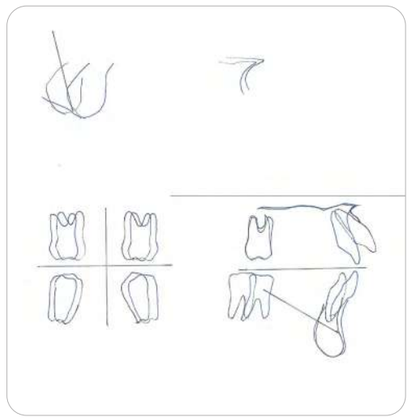


Fig. 53
Superpositions fin/VTP.

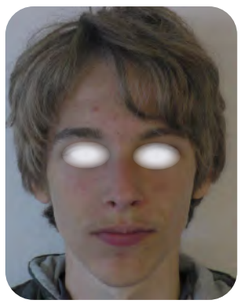
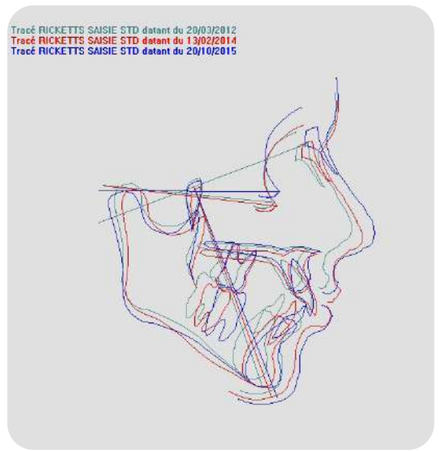


Fig. 54
Post-retention, two years after treatment.

Fig. 55 à 59
Intraoral photos at the end of retention.



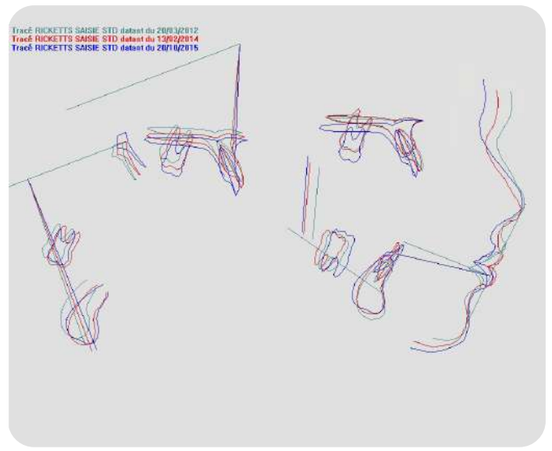


Fig. 60 et 61
Global superposition and five Ricketts superpositions.

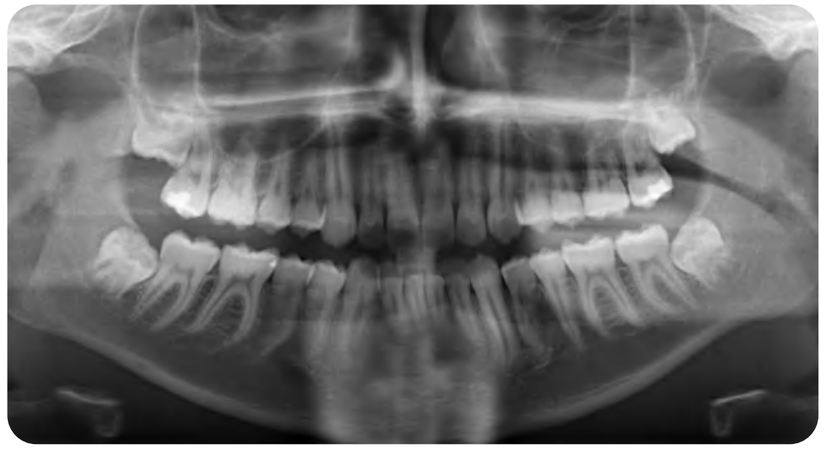


Fig. 62
Final panoramic.

Extraction or Non-extraction: Symphyseal Distraction

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This case was previously presented in L'Orthodontie Française *under the following reference: Jean-Luc Ouhioun. Symphyseal distraction: a case series. L'Orthodontie Française. 2021;92(1):37-65*

ABSTRACT

The debate over "to extract or not to extract" remains ongoing. However, priority should always be given to diagnosis based on a thorough dental, skeletal, esthetic, and functional assessment. Therapeutic methods are meant to achieve the objectives resulting from this diagnosis—the only way to individualize the treatment plan according to the patient. Symphyseal distraction is a surgical procedure aimed at increasing the mandibular bony base at the symphysis and subsequently allowing for an ideal positioning of the mandibular incisor.

CASE REPORT: GUILLAUME L., 9 YEARS 3 MONTHS

Guillaume consulted with his father for a dental crowding issue in both arches. He was 9 years and 3 months old and exhibited many facial signs of oral breathing, particularly dark circles under the eyes and bluish coloration of the lower eyelid. The medical history confirmed our suspicions. He did not snore during sleep, but his breathing was noisy and strictly oral at night. His pillow was frequently stained, explained by a mouth-open posture and nocturnal drooling. The dental examination showed a Class II molar and canine relationship with a 7 mm overjet and 50% overbite, bimaxillary endognathia, and a molar end-to-end occlusion on the left side. The maxillary arch displayed a pronounced V shape. There was significant maxillomandibular crowding.

From an esthetic standpoint, a retruded chin was noted, although this was not confirmed by cephalometry. His facial type was brachyfacial.
The treatment plan included, after eruption of teeth 14-24 and 34, an orthopedic maxillary expansion combined with surgically assisted mandibular distraction, followed by the placement of a quad-helix to correct the arch form. The treatment would continue with fixed multibracket appliances for arch leveling, Class II interarch elastics, incisor positioning, finishing, and retention.

At the very end of the treatment, gingival recession appeared, linked to a thin periodontium, a short epithelial-connective attachment, and a prominent lower labial frenum. Dr. Samuel Salino performed a connective tissue graft for reinforcement and coverage extended to tooth 31 via a palatal graft, as well as a lower labial frenectomy. The third molars were extracted at the end of treatment to facilitate the eruption of the second molars.

Fig. 1
Initial treatment photographs.

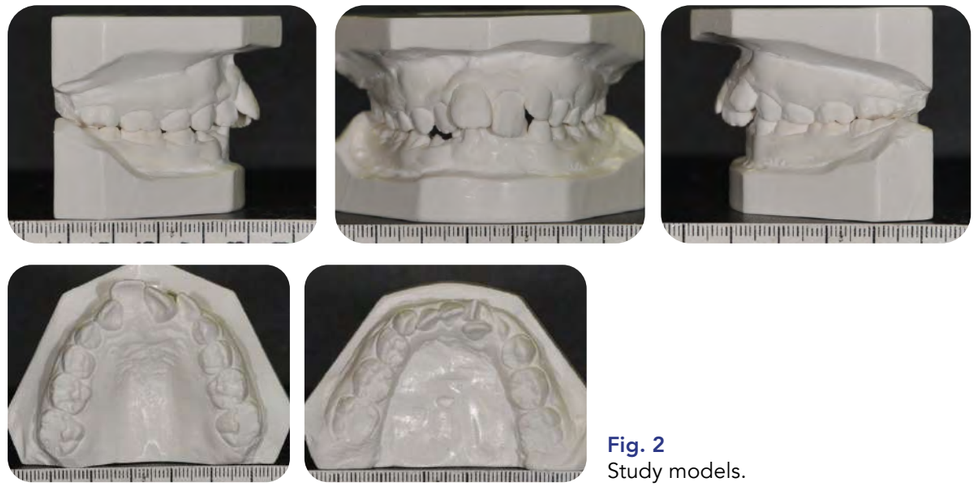
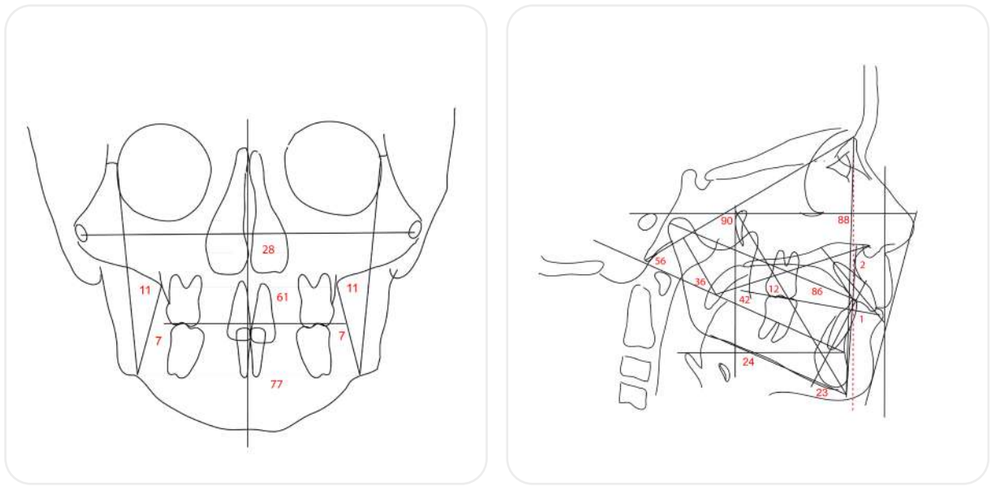


Fig. 2
Study models.

Fig. 3 a, b et c
Initial radiographic assessment.



Drawings A et B
Initial frontal and profile studies.

Fig. 4
Orthopedic maxillary expansion and symphyseal distraction.

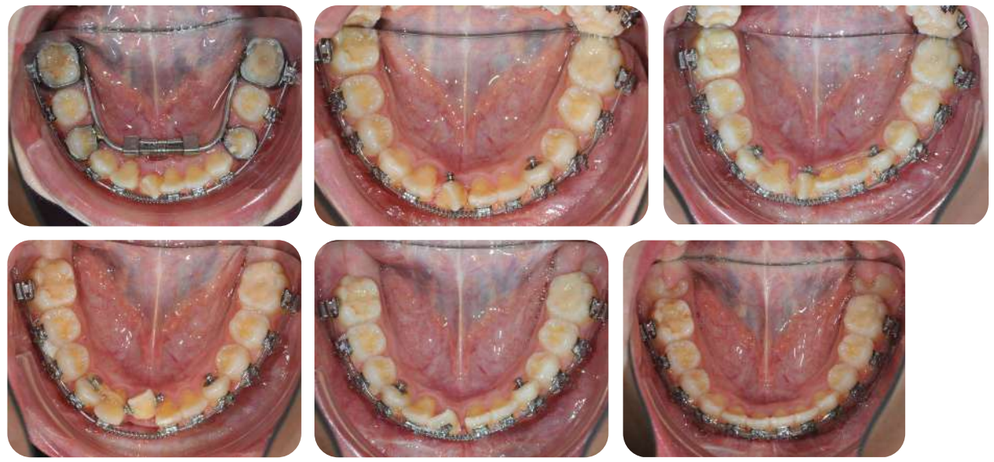
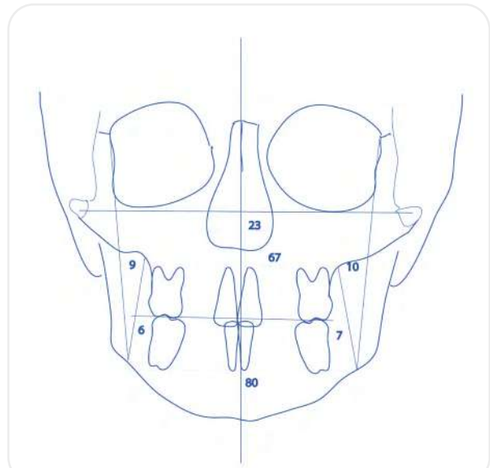


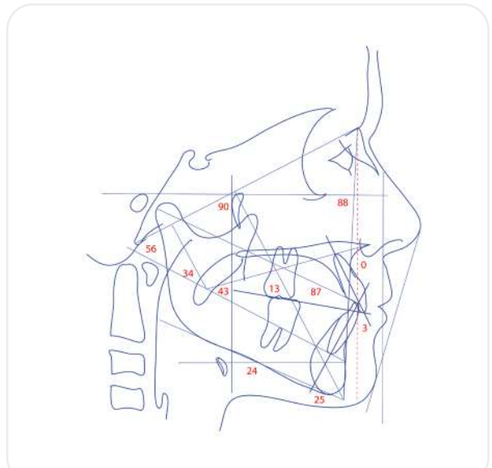
Fig. 5
Progression of mandibular arch leveling.

Fig. 6a
End-of-treatment photographs.

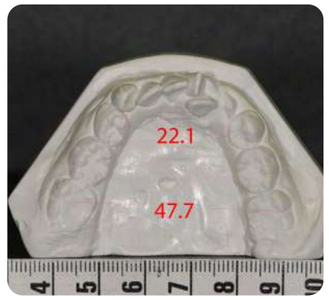
Fig. 6b
Final radiographic assessment.

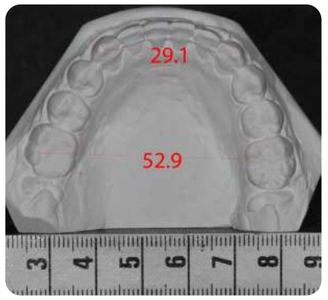
Fig. 7
Final frontal and profile studies.





Drawings C et D
Final frontal and profile studies.





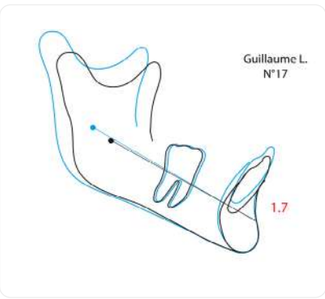


Fig. 8
Obtained results.

CONCLUSION

Symphyseal distraction osteogenesis appears to us as a reliable method to achieve transverse expansion of the anterior mandibular arch and represents an effective alternative both physiologically and esthetically.

As noted with regret by Savoldelli *et al.* in 2015, this technique remains marginal as it is perceived as invasive, complex, and risky. This statement is still considered valid in 2025, although we have been using this procedure since 1997, both in young growing children and adolescents as well as adults, with highly significant results.

ACKNOWLEDGMENTS

We would like to thank Professor Pierre Bouletreau and Drs. Christian Paulus and Luc Richard. Without the involvement of surgeons, this type of treatment would not be possible.

CONFLICTS OF INTEREST

The author declares no conflicts of interest regarding the data published in this article.

The ordinary story of a borderline case

Dr Saïd **Kholoki**
SQODF
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INTRODUCTION

Once upon a time, there was a 12-year-old Egyptian girl named Mariam. She came to my office with her mother for an orthodontic consultation. Her main demand was: Teeth too far forward!
I will focus on the diagnostic system used to treat this case using Gugino's therapeutic chart. Our case can be described as follows.

CLINICAL EXAMINATION

Mariam has few functional problems, with a class I denture with crowding. She is aware of her aesthetic concerns and ready to collaborate as much as possible (fig. 1 and 2).

DENTURE DESCRIPTION

It is a classic case of class I with crowding, without major problems in the vertical direction, and a slight transverse constriction to both dental arches.
All the permanent teeth are present (fig. 3, 4, and 5).

Fig. 1
Extra-oral photos – Start of treatment.

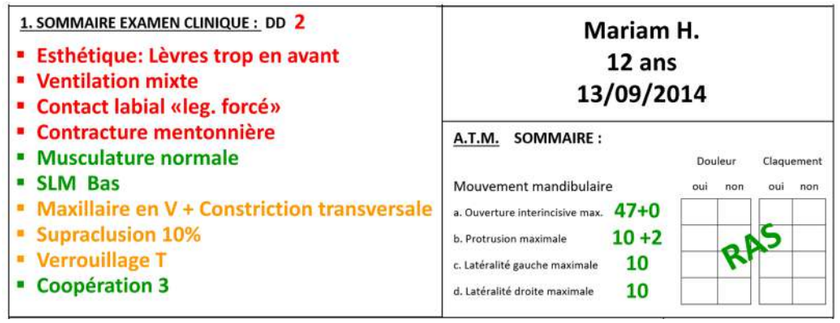


Fig. 2
Clinical examination summary - Start of treatment.

Fig. 3
Intra-oral photos – Start of treatment.

Fig. 4
OPG Start of treatment.

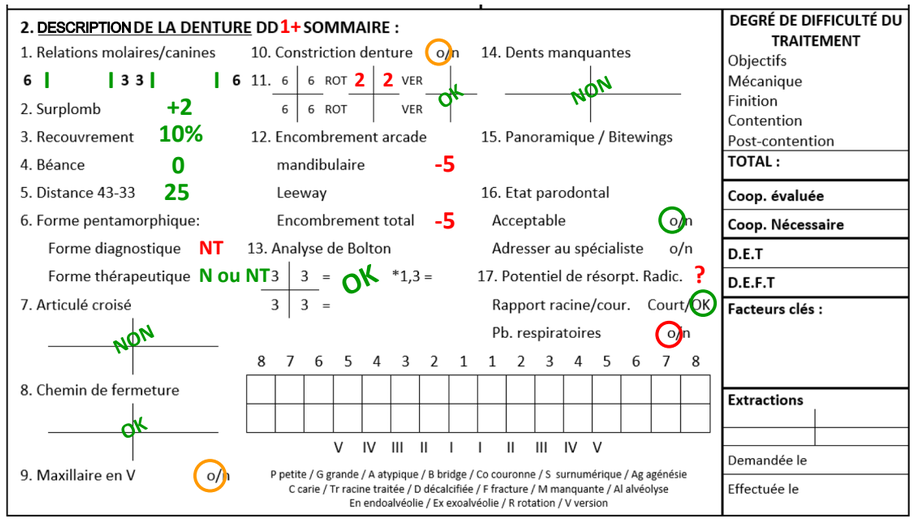


Fig. 5
Review of the denture description.

SKELETAL DESCRIPTION

The examination of the profile x-ray shows the presence of enlarged tonsils, anatomical signs of mesofacial typology and a biprotrusion.

The frontal x-ray reveals a non-permeable right nasal cavity, but no obvious asymmetry.

The cephalometric analysis and synthesis show a class I skeletal relationship with bi-promaxillia, bi-protrusion and a meso tendency brachy vertical pattern (fig. 6, 7, and 8).

AESTHETIC DESCRIPTION

The aesthetic problem of labial biprotrusion is visible, the rest is acceptable (fig. 9).

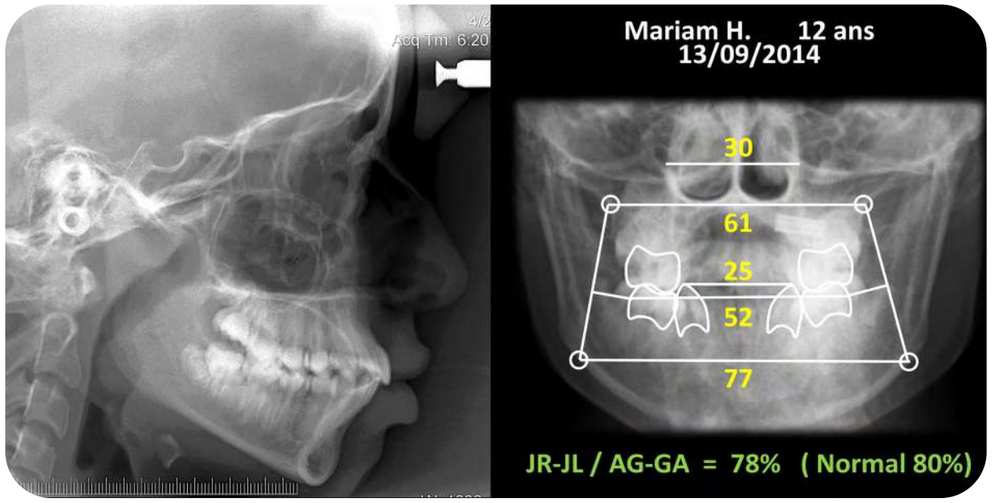
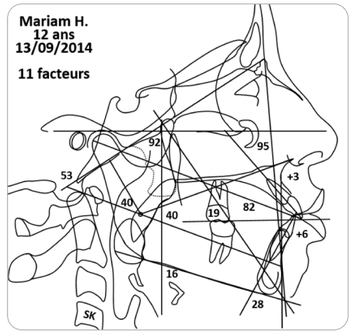


Fig. 6
Facial and profile x-ray – Start of treatment.



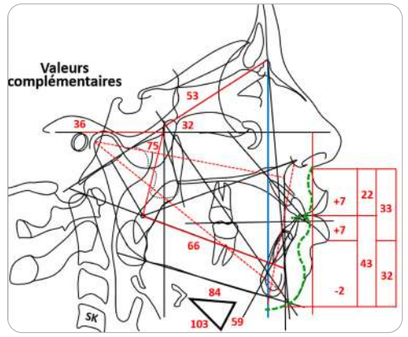


Fig. 7
Cephalometric analysis – Start of treatment.

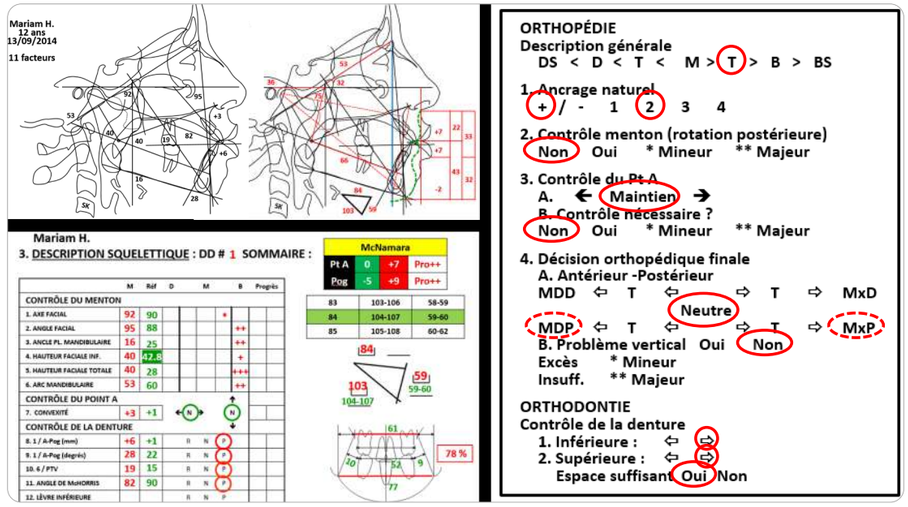


Fig. 8
The cephalometric synthesis

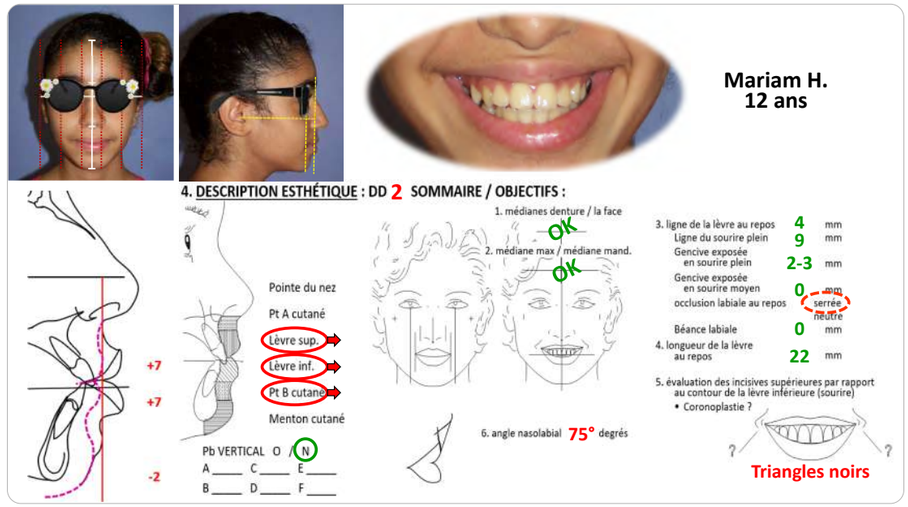


Fig. 9
The aesthetic description.

DESCRIPTION OF FUNCTIONAL MATRIX

Although some signs of nasal obstruction are present, they remain insignificant during clinical examination. However, chin and labial contraction is visible (fig. 10).

This "borderline" case forced me to foresee two scenarios, one without extraction, the other with. Both options are possible.
Each has its advantages and disadvantages, but the option with extraction seemed to me more suitable and perfectly met the main demand of the patient.

Avoiding extractions could make the profile even more protrusive! (Fig.11).
Despite Mariam's wishes, her mother declined the option with extractions and preferred treatment without!

To meet the expectations of both mother and daughter, I suggested starting treatment without extraction, and reassessing the situation a few months later.

A treatment plan without extractions has been implemented to begin with. (Fig. 12).

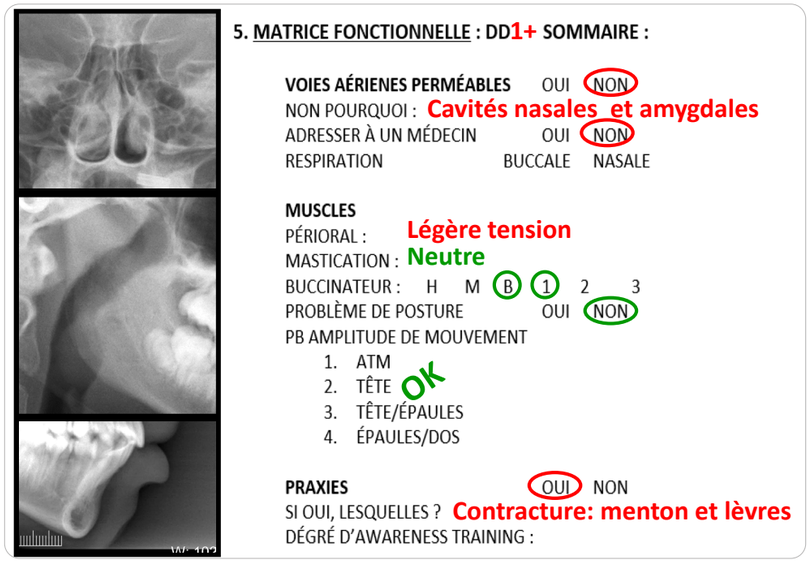


Fig. 10
The functional description.

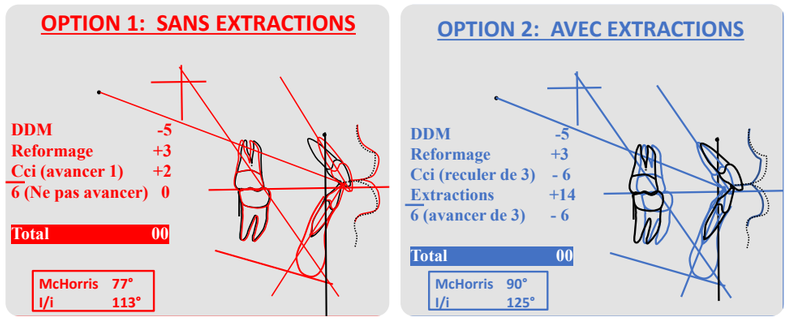


Fig. 11
Projects of treatment with and without extraction.

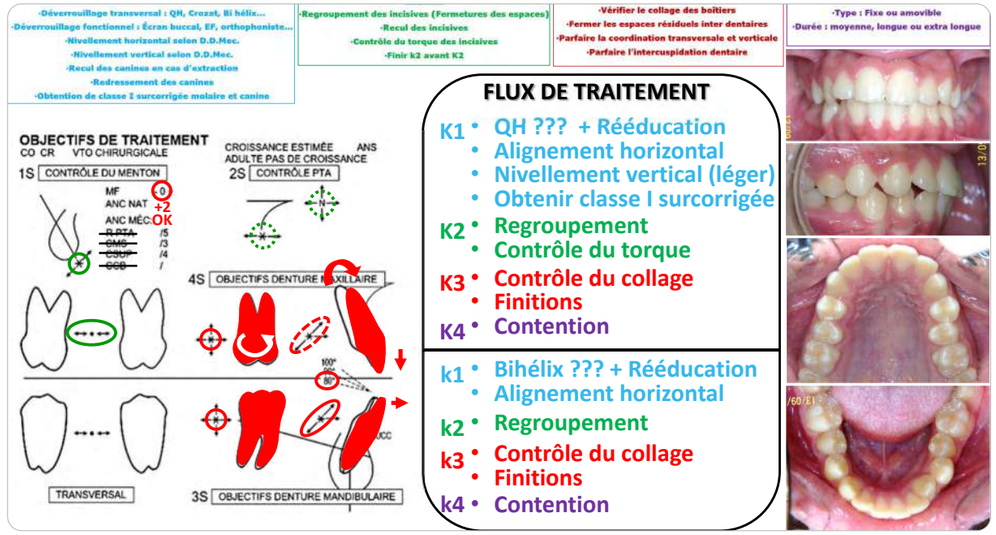


Fig. 12
Treatment objectives without extraction and therapeutic flow.

Six months later a new profile x-ray was made.

It highlights an aggravation of biprotrusion of the front teeth and obviously lip protrusion, which did not please the patient or her mother. They are ready to accept extractions! (Fig. 13).

From the new x-ray, I made a new VTO with more precise objectives and orthodontic superimpositions.

A new treatment plan has been put in place. (Fig. 14 and 15).

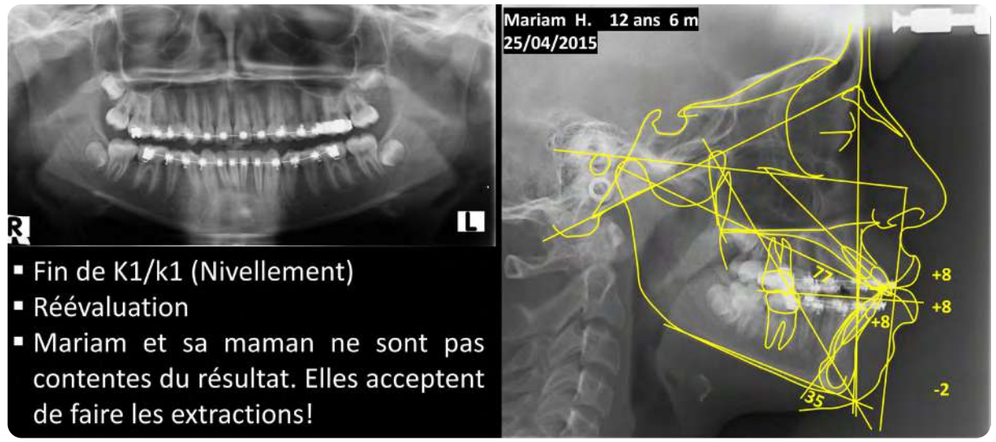


Fig. 13
The situation after the trial period without extractions.

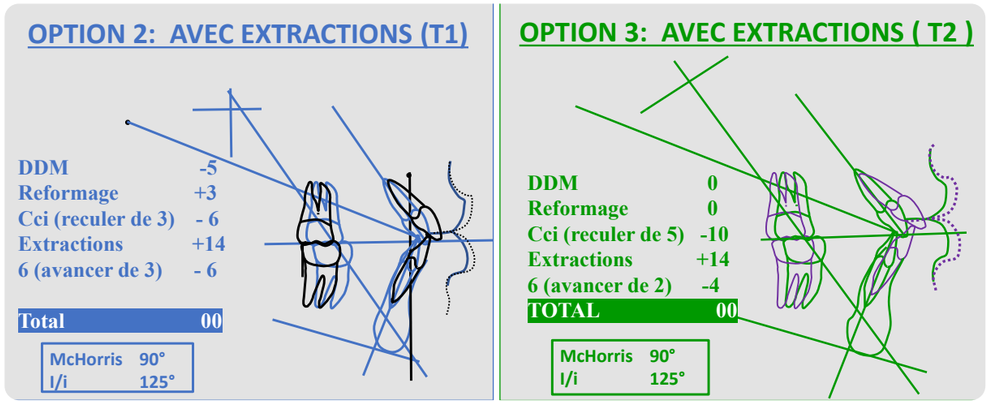


Fig. 14
The two VTOs with extraction from the starting x-ray and from the x-ray after levelling.

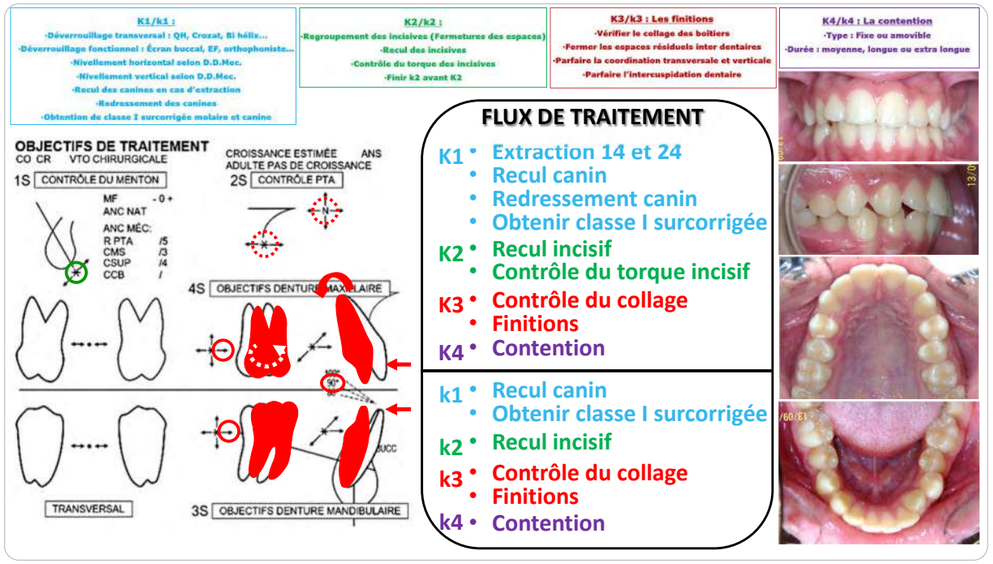


Fig. 15
Treatment objectives with extraction and therapeutic flow.

The case has a low mechanical difficulty which allowed me to treat it in straight wire technique from A to Z.

After treatment, immediate results indicate that some finishing is required, which was achieved using two finishing aligners. (Fig. 16).

Post-treatment x-rays show an acceptable overall stability of the vertical dimension, a significant reduction in bi-protrusion, and an improvement in labial profile.

The comparison of the results obtained with the dental objectives previously set, shows a very satisfactory reliability of the VTO and orthodontic treatment performed. (Fig. 17, 18, 19, and 20).

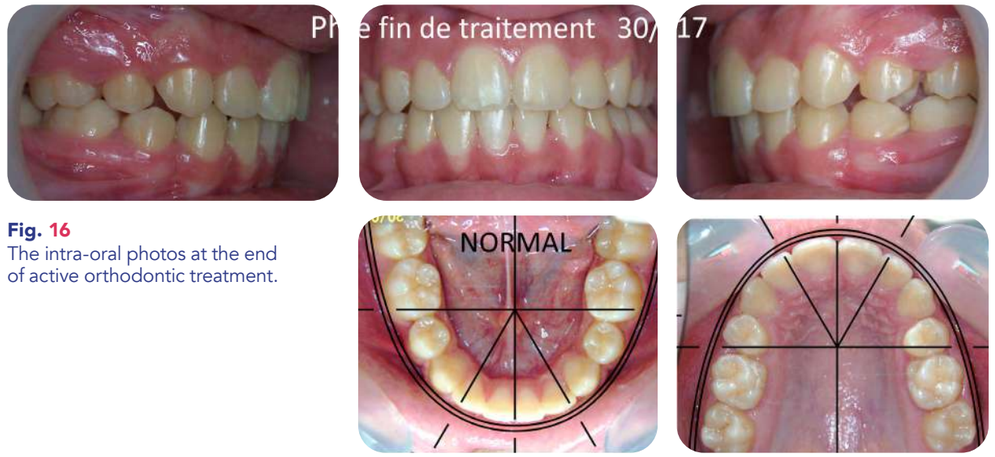


Fig. 16
The intra-oral photos at the end of active orthodontic treatment.

Fig. 17
End of orthodontic treatment x-rays.

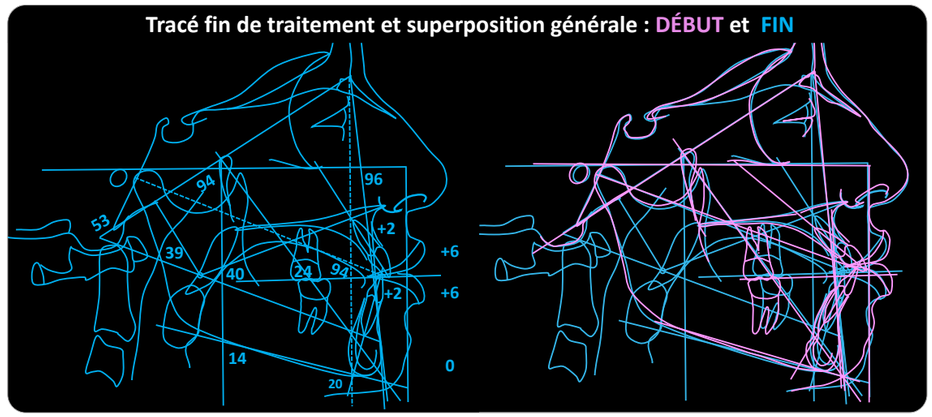


Fig. 18
The end of processing plot, and general superimposition (before/after).

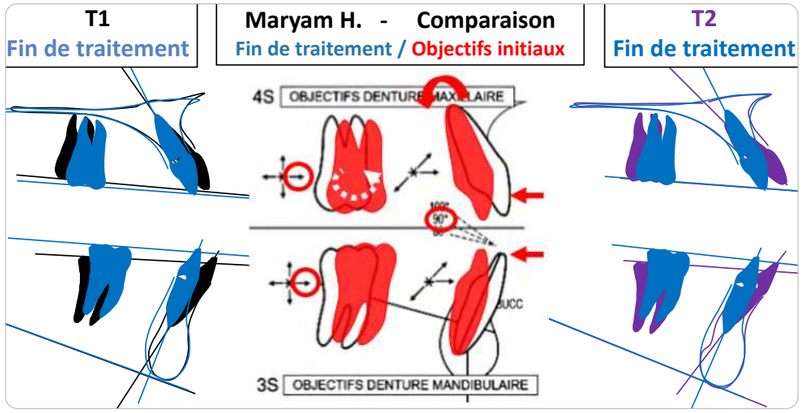


Fig. 19
Comparisons between planned objectives and results achieved.

Fig. 20
Extra-oral photos of the end of ortho-dontic treatment.

Two retention aligners are used. The period of retention lasted 24 months with very good cooperation. Documents at the end of this period show incredible stability of dental occlusion, improved respiratory airway permeability and pleasant joy on Mariam's face. (Fig. 21, 22 and 23).

Fig. 21
The intra-oral photos at the end of the retention phase.

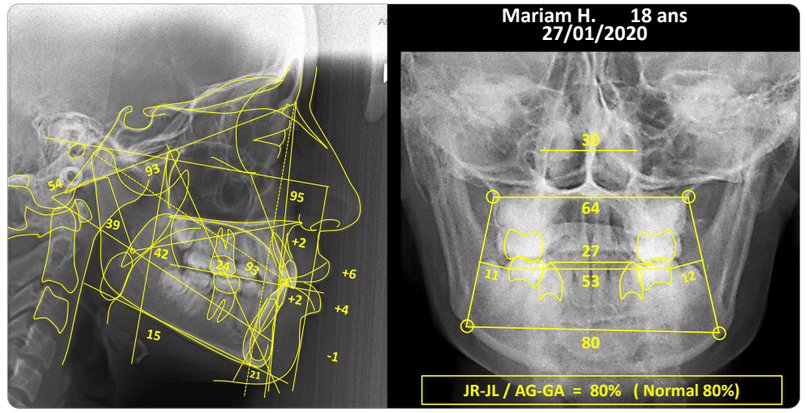


Fig. 22
Radiographic documents at the end of containment.

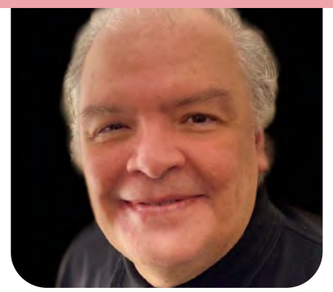
Fig. 23
Extra-oral photos at the end of the restraint.

Five years after the end of treatment, a very satisfactory stability of the case is observed, with a very good functional occlusion.
The wisdom teeth could be placed without any concern (Fig. 24).

This is how our story ends. Everyone was happy, especially Mariam who became a young woman with a radiant smile.

Fig. 24
Intra-oral photos five years after the end of treatment.

The therapeutic approach to a CL III case based on typology, morphology, and etiology



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Exclusively Practicing Orthodontics – Dubai, U.A.E.

INTRODUCTION

Augustin is a 35-year-old native of Saint Lucia. He came for a third orthodontic opinion, seeking a non-surgical solution for his dental issue. The two colleagues who consulted before his visit confirmed that an orthodontic therapeutic choice cannot be made, and that a surgical choice is mandatory.

FACE EXAMINATION (FIG. 1)

Augustin's face reflects his ethnic origin: a long face with a transfrontal profile, associated with a bi-protrusion, full-bodied lips, and a slightly smaller chin. Augustin does not have any remarks on the aesthetics of his face or profile.

ENDO-ORAL AND FUNCTIONAL EXAMINATION (FIG. 2)

Augustin is not affected by respiratory problems, even though he has lingual functional disturbances. His tongue is huge, and he maintains a low posture.
The function of swallowing occurs anteriorly. The lingual frenulum is slightly stronger than usual.

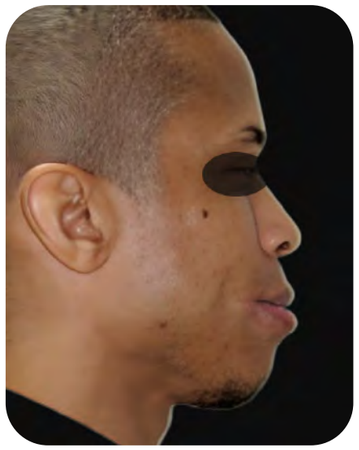


Fig. 1
Photos face and profile Augustin 2021/06/28/.

Augustin had a frenectomy as a young child. The dental report shows CL III canines and molars, with an anterior crossbite. Augustin has an open bite with protrusions on the lower and upper incisors. Dental arches are large in size.

The A.T.M. exam does not show any limitations in right and left lateral movement, and the opening movement is accurate, while there is no stress on the joints or deviation from the path. The quality of the attached gums is good, and the hygiene is satisfactory.

DENTAL DESCRIPTION

The right lower canine and molar are in partial CL III position. The left canine and molar are total CL III. An anterior crossbite of –2 mm with an open bite.
The dental arch shape is normally wide, with slight problems with maxillary molar rotation. The wisdom teeth are present. Crowded lower incisors measuring –4 mm. There are no dental cavities.
The quality of the desmodontal bone is correct, with a positive natural anchorage and a crown-root ratio of 1/3.

Fig. 2
Photos intraoral – Augustin 2021/06/28.

Fig. 3a
Dental descriptions (1) – Augustin 2021/06/28.

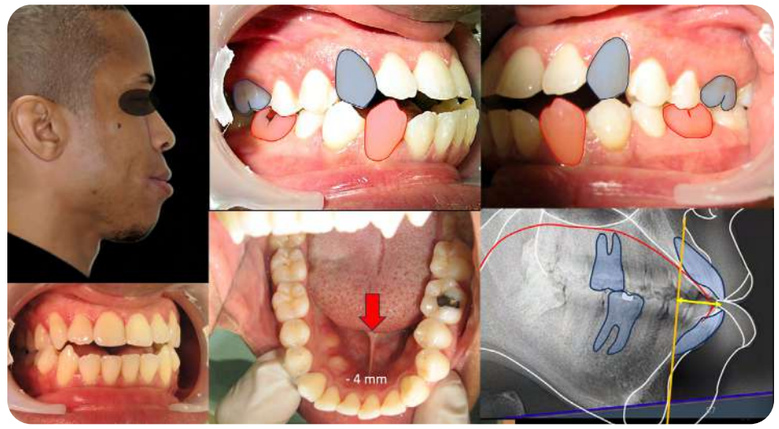


Fig. 3b
Dental descriptions (1) – Augustin 2021/06/28.

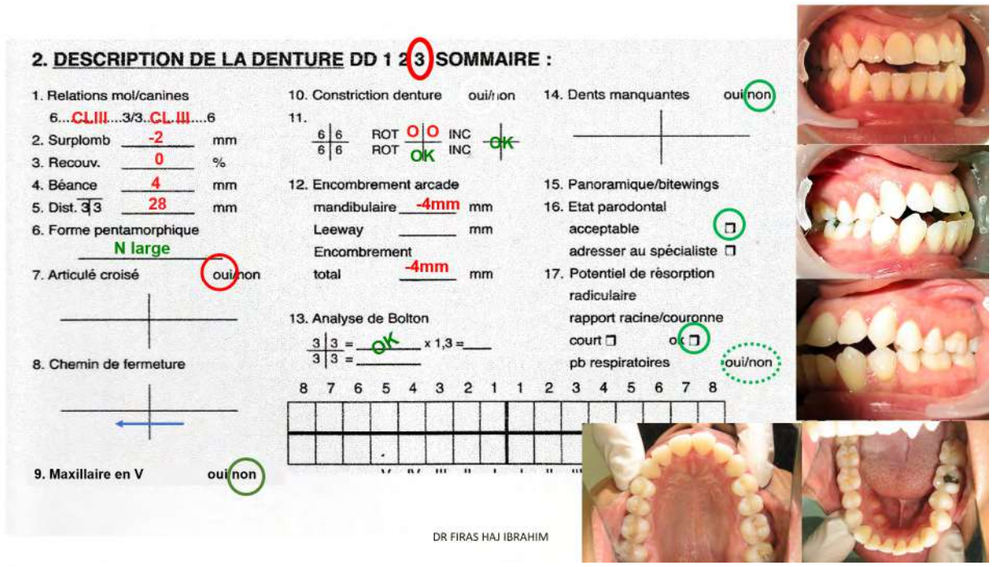


Fig. 4
Dental descriptions (2) – Augustin 2021/06/28.

SKELETAL DESCRIPTION

Eyeball (fig. 5)

Airway clearance, low position of the hyoid, middle lingual posture in its posterior part, and low position in its anterior part.

Cephalometric analysis synthesis (fig. 6 et 7)

The base of the skull is short. Its deflection, as well as its morphology, favors a posterior projection of the maxilla, as well as an anterior projection of the mandible (CL III SKELETAL). The amount of growth of the maxillary and mandibular bone parts is normal. The dolicho-facial typology, which is ethnic in origin, minimizes the anterior-posterior offset. The final intermaxillary skeletal report is CL I (promaxillary/promandibular).

The final facial pattern does not reveal any skeletal relationship of CL III. The profile is transfrontal, with an excessive protrusion of the maxillary and mandibular incisors (ethnic biprotrusion). (Fig. 6/7).

The dental report is CL III due to the mandibular dental arch being in the anterior position and the occlusion planes being inclined.

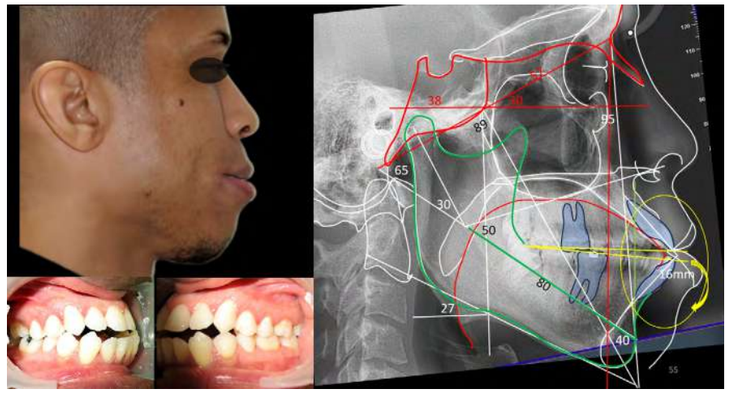


Fig. 5
Skeletal descriptions, Eyeball – Augustin 2021/06/28.

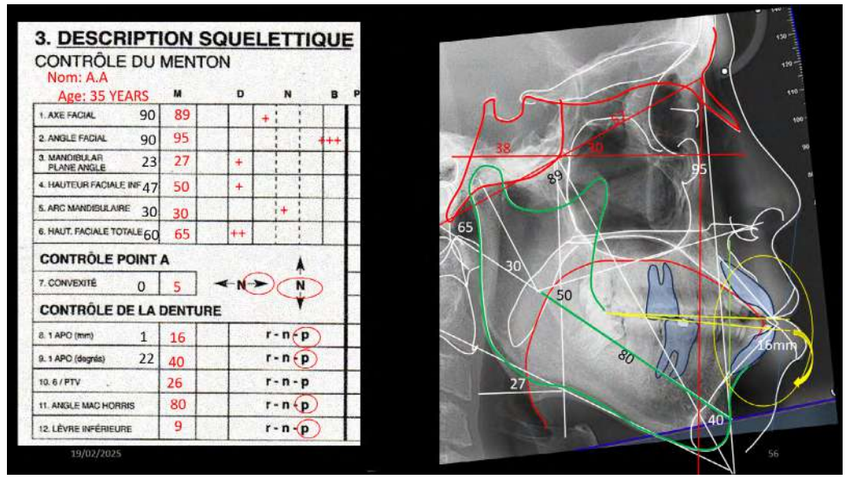


Fig. 6
Skeletal descriptions, cephalometric analysis – Augustin 2021/06/28.

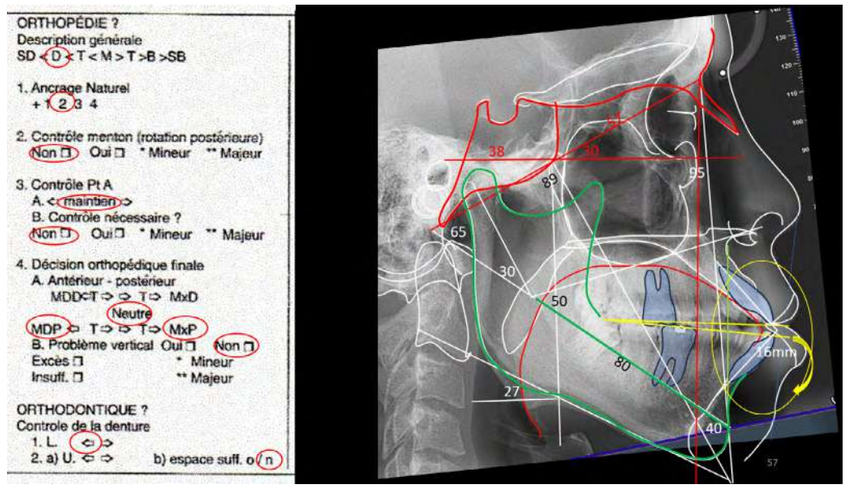


Fig. 7
Skeletal descriptions, cephalometric analysis – Augustin 2021/06/28.

AESTHETIC DESCRIPTIONS (FIG. 8)

The face is elongated with a transfrontal profile in perfect harmony with the skeletal ratio. It does not reflect the dental CL III ratio. The patient has a biprotrusion.

FUNCTIONAL MATRIX (FIG. 9)

Ventilation is nasal, the orbicularis is loose, the lips are fleshy, the tongue is large, posture and functions are disturbed, and mobility is limited. The functional matrix of the tongue is the most important pathological factor.

It could be responsible for the mesial derivative of the mandibular dental arch, CL III occlusion with anterior crossbite, and the excessive vestibular protrusion of the mandibular incisors. (Fig. 9). To ensure good therapeutic conduct and stability of results, tongue proficiency is an essential element of therapy.

TREATMENT OBJECTIVES (FIG. 10)

Augustin's CL III dental occlusion is diagnosed with a mesial derivative of the mandibular dental arch and a bascule of the occlusion plane, with a crossbite and an open bite.

Pathological changes in the mandibular dental arch are closely related to disturbances in the lingual functional matrix (based on its volume, posture, functions, and mobility).

The morphology and growth of the base of the skull can promote an intermaxillary skeletal relationship of CL III.

Despite the normal development of the maxilla and mandible, and the patient's dolichofacial structure, a skeletal report of CL I with a transfrontal profile (mostly ethnic) was produced. The aesthetic profile is harmonious with the skeletal ratio, so there is no need for orthognathic surgery.

Orthodontic treatment is indicated. It consists of establishing a dental CL I report, correcting the open bite, the crossbite, and straightening the mandibular occlusion plane.

The mandibular dental arch needs to be straightened and retracted without altering its wide shape, and it needs to be in harmony with the lingual volume. The choice of premolar extraction is not recommended. Therapeutic objectives are difficult to achieve due to the significant amount of retraction of the mandibular dental arch.

Extraction of mandibular wisdom teeth could be a solution to find the required space for the desired movement, without affecting the width of the dental arches. Rehabilitation of lingual posture and function is crucial for successful treatment.

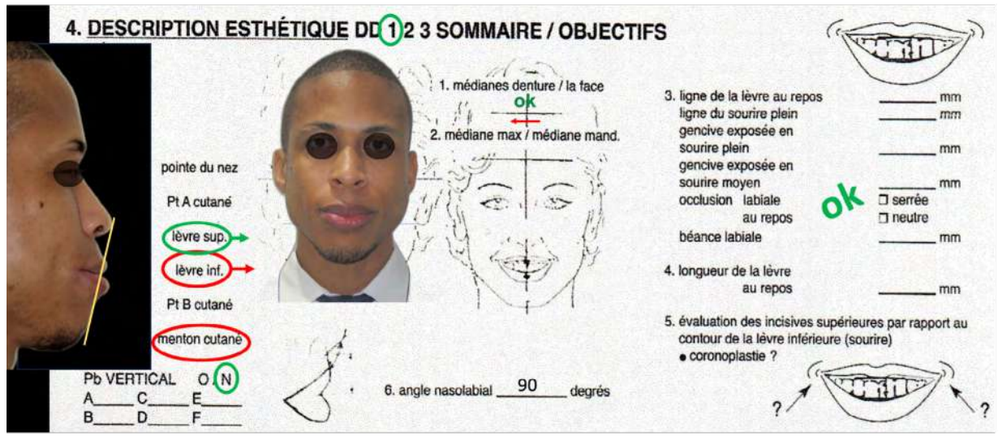


Fig. 8
Aesthetic description – Augustin 2021/06/28.

The functional neutralization of the tongue could be facilitated by releasing lingual mobility through a frenectomy.

The feasibility of functional rehabilitation in adults is a subject of considerable controversy. From our perspective, as long as there is willpower and the ability to intervene and perform functional exercises, the outcomes could be favorable.

Our clinical experience in adult cases has shown us the effectiveness of the procedure, with varying degrees depending on patient motivation. The question that needs to be addressed is whether or not the patient is motivated to carry out these functional exercises. (Fig. 10).

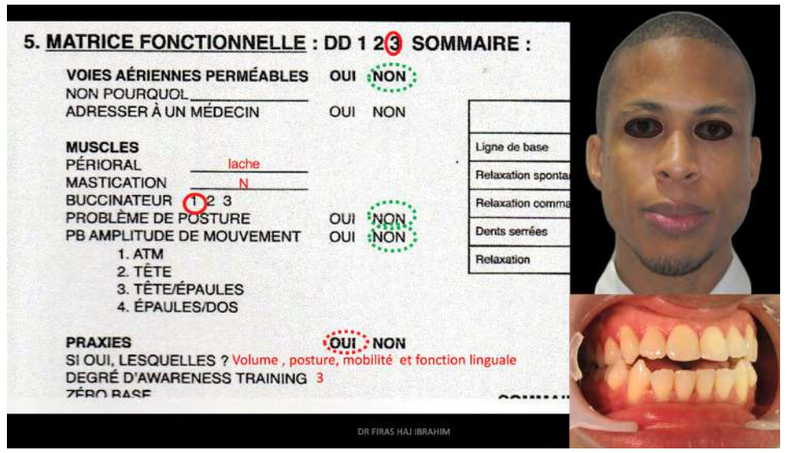


Fig. 9
Functional matrix – Augustin 2021/06/28.

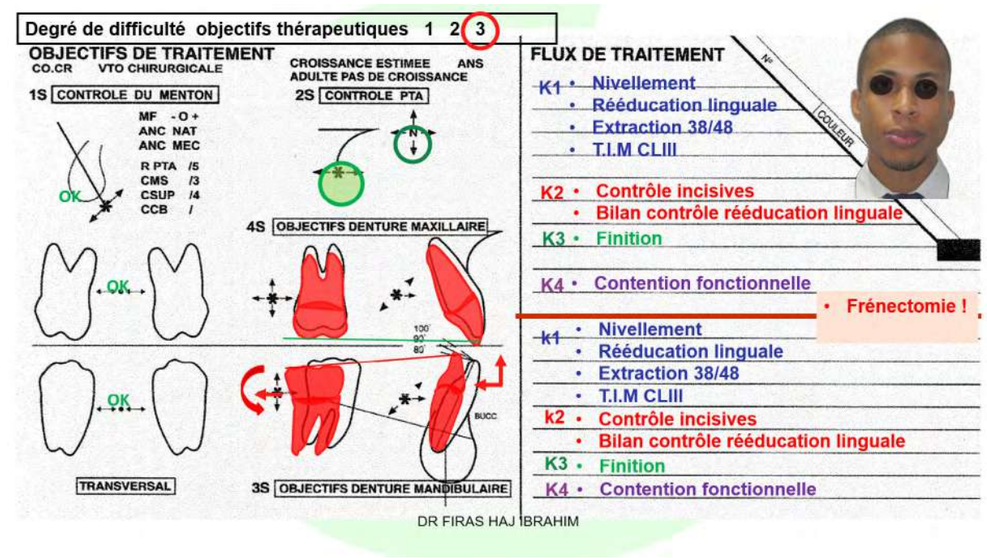


Fig. 10
Flow of treatment – Augustin 2021/06/28.

THE FLOW OF TREATMENT

1 – Levelling (fig. 11)

For the levelling stage, M.B.T. self-ligating brackets were selected. It is beneficial for the mandibular incisors to use a negative vestibular-root torque (-6°) when controlling extra vestibular protrusion. Most of the time during the levelling stage, the NI/TI straight arc technique with variable sections was utilized.

2 – Rehabilitation of the tongue

Tongue awareness training started at the first appointment. The tongue's mobility was sufficient to carry out the exercises, so the frenectomy was postponed. A functional educator (E.F. braces) was also employed. Nasal ventilation made it easier to use the apparatus. Patient motivation was excellent.

3 – Elastic mechanism of CL III correction (fig. 12 et 13)

At the end of the levelling stage, extraction of mandibular wisdom teeth (38/48) was prescribed. CL III elastic intermaxillary traction was established one week following the extraction. At the time of completion, elastic traction for CL I was used to confirm the occlusal position.

4 – Finishing (fig. 14 et 15)

The finishing stage was quite long. For this stage, classical metallic RICKETTS brackets were utilized. Control of the occlusion plane took a long time, and tongue rehabilitation was very effective. To improve lingual function, the patient accepted the frenectomy.

5 – Retention (fig. 16 et 17)

The inter-canine mandibular zone was secured with a fixed metallic retainer.
A removable polycarbonate retainer for the maxillary dental arch was prescribed.

Augustin was advised to keep his functional reeducator and use it occasionally.

The treatment lasted 3 years. Augustin was frequently out of the country due to his work. This situation gave us the opportunity to confirm functional rehabilitation over a longer period.

Fig. 11
Levelling Augustin, 2021/08/19.

Fig. 12
Elastic traction CL III – Augustin 2021/06/12.

Fig. 13
2022/05/19.

Fig. 14
Finishing – Augustin 2023/11/19.

Fig. 15
End of finishing stage.

Fig. 16
End of treatment – Augustin
2024/06/13.

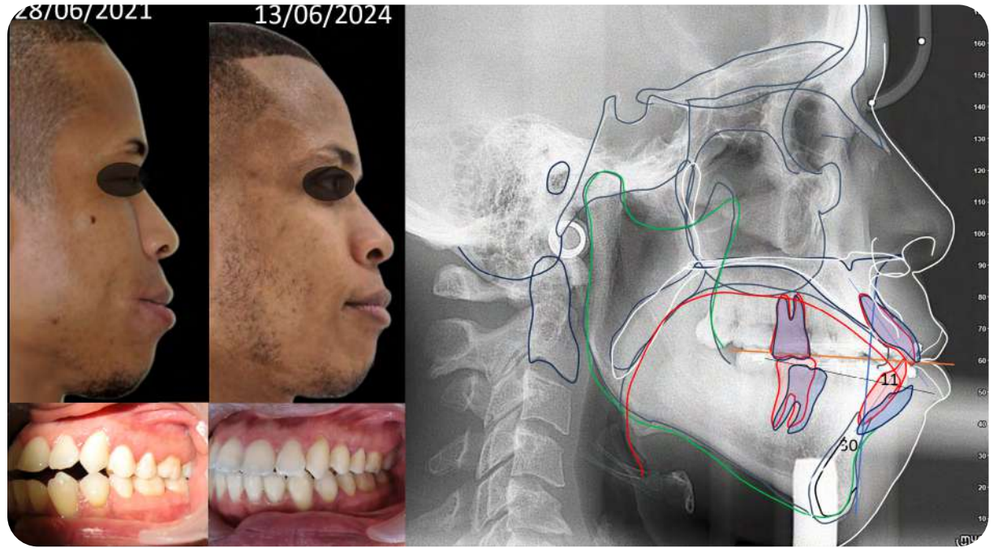


Fig. 17
Superposition of T1 and T2 – Augustin 2024/06/13.

6 – Post-treatment evaluation (fig. 18 et 19)

Eight months of post-therapeutic control showed stability in the rapport between molars and canines in CL I, with correct mandibular realignment and no occlusion plane tilt.
The width of the dental arches has been preserved.

Toning of the tongue and effective posture rehabilitation have occurred.
The biprotrusion of the lips is maintained, with slight recession of the lower lip.
The quality of the alveolar bone is preserved.

An egression of the maxillary wisdom teeth is noted, due to the absence of antagonistic teeth.

Fig. 18a
Post-treatment evaluation – Augustin 2025/01/25.

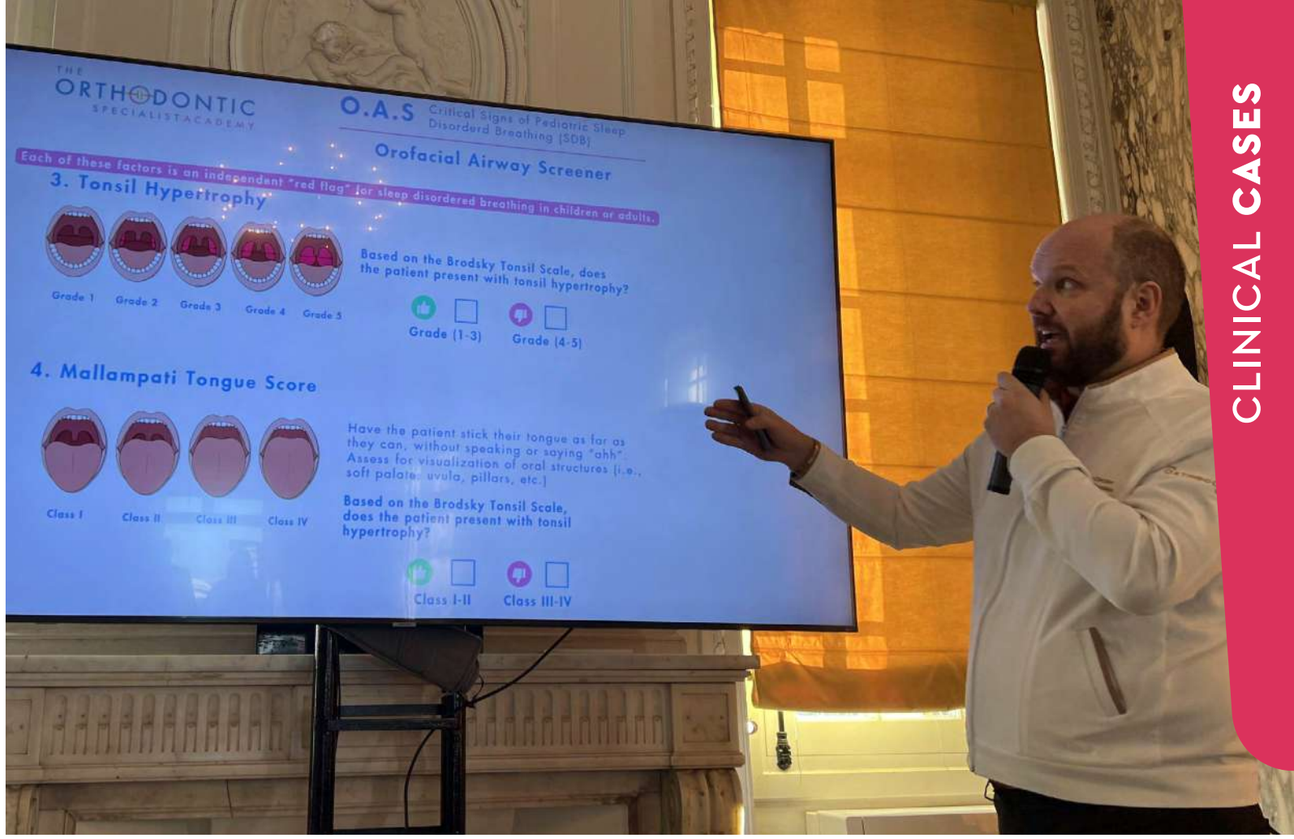
Fig. 18b
Post-treatment evaluation – Augustin 2025/01/25.

Fig. 19
Post-treatment control – Augustin 2025/03/01.

"Prevention is Better Than Cure"
Utilize Angel Aligners for Preventative Orthodontics

Dr Steffen **Decker**

SQODF
(Orthodontic practice in Amersham
United Kingdom)



Advancements in dental care have reshaped our approach to orthodontics, shifting the focus from reactive treatments to proactive, preventative strategies. At The Orthodontic Specialist, we believe that early intervention is key to long-term oral health, particularly in pediatric cases.

Drawing upon insights from our recent collaborative meeting in Marseille on February 3, 2025, with the Societe Bioprogressive Rickets, this article explores the multifaceted benefits of interceptive clear aligners—specifically, angel aligners—and outlines our responsibility as orthodontists in guiding young patients toward healthier futures.

SCREENING YOUNG CHILDREN: OUR RESPONSIBILITY AS ORTHODONTISTS

Early screening is paramount in identifying dental and airway issues in children.
As orthodontists, we have a duty to assess growth patterns and intervene before minor discrepancies evolve into major problems. Early diagnosis not only improves treatment outcomes but also reinforces our commitment to holistic patient care.
Red Flags of Pediatric Sleep Disorder Breathing
Pediatric sleep disorder breathing is a growing concern. Red flags include habitual snoring or gasping during sleep, daytime sleepiness and behavioral issues, mouth breathing, recurrent infections, and poor growth patterns. Recognizing these signs early allows us to address underlying airway issues, which may have significant implications for dental development.

THE POWER OF THE HIGH TRIM LINE IN ANGEL CASES AND EXPANSION

Angel aligners are designed with a high trim line, which offers significant advantages. This feature enhances aesthetic integration while facilitating dental arch expansion.
The high trim line supports the controlled movement of teeth, ensuring that expansion is both efficient and comfortable for the patient.

THE CRITICAL NEED FOR EARLY TREATMENT: KIDS DO NOT GROW OUT OF THE PROBLEM, THEY GROW INTO THEM

Early intervention is crucial—delaying treatment can result in the progression of malocclusions and airway issues. Children who do not receive timely care may develop more severe complications as they grow.

This principle reinforces that prevention is better than cure. Our proactive approach ensures that we intercept issues before they become entrenched.

WHY INTERCEPTIVE CLEAR ALIGNERS?

Interceptive clear aligners offer a less invasive alternative to traditional braces, especially during the critical developmental stages in children.
They allow for gradual correction of minor misalignments and contribute to better overall dental function. Their transparency and removable nature also help maintain oral hygiene and comfort.

BENEFITS OF CLEAR ALIGNERS

Clear aligners provide several key benefits: their aesthetic appeal, being virtually invisible, boosts patient confidence; they are comfortable, with a custom-fit design that reduces irritation compared to metal braces; their removability facilitates easier cleaning, thereby reducing the risk of decay; and they offer precision, with advanced technology ensuring predictable, controlled tooth movement.

CHALLENGES AND SOLUTIONS

While clear aligners offer many benefits, challenges include ensuring compliance, particularly with children; customization of treatment plans for rapidly growing patients; and managing the adjustment period by educating patients and guardians on maintenance and care.

The solutions lie in thorough patient education, regular follow-up appointments, and leveraging digital planning tools to tailor treatment to each child's unique growth pattern.

GENETICS VS. EPIGENETICS IN ORTHODONTICS

Understanding the interplay between genetics and epigenetics is essential.
Genetics provides the blueprint for dental and skeletal structures, while epigenetics explains how environmental factors, such as habits and functional behaviors, can modify these outcomes. This dual perspective reinforces the importance of early, interceptive treatment to influence positive dental development.

ENHANCING FUNCTION: THE FEATURES OF ANGEL ALIGNERS

Angel aligners are engineered with features that promote optimal oral function. They include a tongue guide, which helps direct the tongue into a healthy posture critical for proper dental arch formation, and a habit breaker, which assists in eliminating detrimental oral habits like thumb sucking. These functional elements work synergistically to support both aesthetic and structural dental improvements.

ANGEL BUTTONS AND STAGING IN CHILDREN

Angel buttons serve as anchorage points and play a vital role in staging treatment for children. By facilitating sequential tooth movement, they help achieve precise alignment at each developmental stage. This staged approach ensures that the treatment is both adaptive to growth and predictably effective.

PREDICTABILITY OF MOVEMENTS

The use of advanced digital modeling in the angel aligner system provides a high level of predictability in tooth movements. This technology allows orthodontists to simulate treatment outcomes and adjust plans accordingly, ensuring that the progression of tooth movement is both accurate and efficient.

AIRWAY ASSESSMENT AND TREATMENTS

A comprehensive orthodontic evaluation should always include an airway assessment. Identifying obstructions or restrictions early on enables targeted treatments that improve not only dental alignment but also overall respiratory function. Interventions may range from minor adjustments with clear aligners to collaborative treatments with sleep specialists.

GROWTH OF YOUR BUSINESS FOCUSING ON CHILDREN

Focusing on early intervention in children not only benefits patient outcomes but also positions your practice for sustainable growth.

By offering interceptive clear aligners and comprehensive pediatric screenings, practices can build a reputation for forward-thinking, patient-centered care.

This proactive approach attracts families seeking long-term dental health solutions and establishes a loyal patient base.

In summary, angel aligners represent a significant advancement in preventative orthodontics, combining aesthetic appeal, functionality, and scientific precision. Early screening, targeted interventions, and innovative treatment protocols are vital in ensuring that children do not simply outgrow their problems but are instead guided toward optimal dental health. As we continue to innovate and refine our techniques, our commitment to early, ethical, and effective treatment remains at the forefront of our practice.

This article is intended for informational purposes only and is not a substitute for professional medical advice. Patients and guardians are encouraged to consult with a licensed orthodontist to discuss individual treatment needs.

A Complete Guide to Choosing and Using

Functional Ortho Appliances for Children

The Treatment of Crowding and Class II Cases with U Concept Appliances – the Possibilities of Prevention in Orthodontics.

Dr Veronika **Dercsar**
Hungary

INTRODUCTION

Modern orthodontists have a plethora of treatment methods to choose from when planning theirtreatment. In the past decades emphasis was on the development of materials and technologies, at first in the field of fixed appliances, then TADs, and nowadays in the area of aligner treatment.
With the advent of digitisation it has become possible to precisely plan 3D tooth movement, to delegate parts of the process and to follow a case from a distance.

The average age of young patients is 10-12 years when first seen by the orthodontist. This age determines the typical pathologies already developed as characteristic of race, age, facial type. Manufacturers have reacted to these pathologies by developing various appliances and accessories which make treatment quicker and more effective. The number of adult patients keeps growing who mostly seek solutions to aesthetic issues but also to functional or other problems.

If one considers these developments some questions arise. Why is there a need for such a high number of orthodontic treatments?
Why is there such a high number of patients requiring complex treatment? What are the reasons behind this? Is it possible to intervene somewhere to prevent theprogression of these malocclusions? As said in 1962: The paucity of our present knowledge of etiology in orthodontics compels us to attack the cause and effect relationship from the wrong end – that of effect.

By working backward we shall undoubtedly arrive at the beginning someday. How nice would be to approach it from the other end.
Behind each maloccluson there is a degree of dysfunction.
If a child is only seen at the age of 10 or 12, by then dysfunction, such as muscle weakness, muscle tension have already affected the size of the jaws and the child's face. Bad habits are imbibed into muscle function and only hard work and perseverance can change them.

It is not always possible to correct the changes in the face with fixed appliances, thus it is not always possible to create the best possible version of the child's face by the end of the treatment.

Why children are seen at that age has multiple reasons.

Generally it can be said that parents get theinformation from multiple sources that an orthodontist should only be seen once the permanent teeth have erupted.
This attitude must change.
In functional orthodontics the principle is that visible and also not very obvious dysfunction should be treated as soon as possible – if possible already in infancy.

Parents should be informed and educated on the most important issues and possible solutions to them (breast feeding, nose cleaning, nasal aspiration, mastication, using a cup. nursery rhymes, singing, etc.). Dentists need to be encouraged to diagnose the patient as early as possible and should be presented with effective treatment options to prevent the negative effects of existing dysfunction from developing.

This principle was already laid down in 1918 by Alfred Rogers, the father or Myofunctional Therapy, Angle's disciple, who believed that proper oral muscular function needed to be established through exercises, rather than assuming that it would follow the establishment of good occlusion.

During consultation emphasis is on oral breathing and therefore on the position and function of the tongue. Facial type, perioral muscles muscles of mastication are assessed as well as asymmetry and compensatory mechanisms. Efficient treatment requires teamwork. In addition to the parent, the child and the orthodontist, the team may include speech therapists, physiotherapists, osteopaths, allergologist, etc. An effective element of the treatment is the U concept family of products.

These appliances come in various sizes, shapes and hardness enhance nasal breathing help muscle and function harmonisation, and actively shape the development of the dental arches and help resolve crowding. in addition exercises targeting the various muscles groups are taught and advice given.

Naturally it basically relies on the efforts of both parents and children, which is not always available, but based in the author's experience hard work yields good fruit.

In the three cases – triplets - presented here the efficacy of early treatment with functional trainers is shown as well as the advantages of early intervention.
In the brotherhood here are two girls and a boy. They were born premature - birth weight between 850 and 1900 grams.
This created further issues to be managed in terms of mouth breathing and the development of the face and jaws.
The girls first presented when they were 9 years and 3 months old and their treatment started soon after that. The treatment of the boy started six months later. It is important to remark that often if the upper front teeth seem to be straight to the parent ten the child might not be taken to see the orthodontist.

Basal changes or a deep bite does not seem to be a real problem to parents and unfortunately sometimes not even to the treating dentist. This is one of the reasons why treatment is often started late already with an indication of extraction and already developed dysfunction endanger the stability of the achieved results of the treatment.

CASE 1: LOUISE 9 YEARS AND 3 MONTHS.

Orthodontic pathology: Cl II/1, narrow maxilla, retrognathic mandible, crowding, lack of space, lower incisors bite on the palate.
Functional issues: mouth breathing, the lower lip is trapped behind the upper incisors, weak upper lip, the musculature of the lower lip is too tight at rest and in function. Bad posture, head in an anterior position.

CASE 2: LUCIA 9 YEARS, 3 MONTHS

Orthodontic pathology: Cl I, Cl II tendency, crowding, lack of pace, narrow maxilla.
Functional issues: the lower lip is too tense, the upper lip is weak, bites on the palate.
Initial situation - appliance used : U trainer, U trainer rigid.

The appliance U pilot was chosen to continue. Here there is a choice of 7 sizes and it is recommended.

Fig. 1, 2 et 3
Initial situation - appliance used : U Cl II pre, after 6 months U trainer.

Fig. 4, 5 et 6
After one year – treatment continued : U trainer.

Fig. 7, 8 et 9
After2 years - treatment was continued with a semi rigid U trainer appliance.

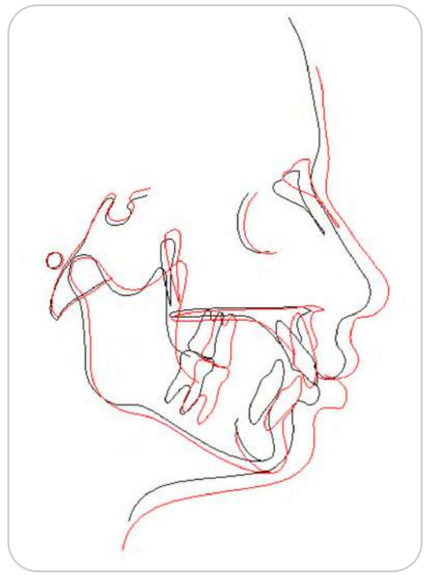


Fig. 10
Tracing.

Ricketts			
	20/01/2024 (CN)	22/01/2022	20/01/2024
6u-6l (OcP)	-3.0±3mm	1.9mm	0.1mm
Overjet	2.5±2.5mm	12.9mm	3.8mm
Overbite	2.5±2mm	5.2mm	3.2mm
1l-OcP	1.3±2mm	4.8mm	1.2mm
3u-3l (OcP)	-2.0±3mm	-2.6mm	1.1mm
Max1-Mand1	130.0±6°	125.6°	138.8°
A-NPog	1.4±2mm	3.7mm	4.4mm
ANS-Xi-PM	47.0±4°	41.9°	43.5°
6u-PTV	14.0±3mm	8.0mm	9.3mm
1l-APog	1.0±2.3mm	-3.1mm	0.0mm
1u-APog	3.5±2.3mm	9.6mm	3.7mm
Mand1-APog	22.0±4°	12.8°	21.4°
Max1-APog	28.0±4°	41.6°	19.8°
Xi-OcP	-1.0±3mm	3.8mm	2.0mm
Li-NsPog'	-2.6±2mm	0.6mm	2.6mm
ANS-sto	24.0mm	21.7mm	20.8mm
sto-OcP	-3.2mm	-1.9mm	-3.0mm
NPog-POr	87.6±3°	85.0°	85.9°
NBa-PtG	90.0±3.5°	84.1°	83.2°
MeGo-NPog	68.0±3.5°	73.7°	71.5°
MeGo-POr	25.3±4.5°	21.3°	22.6°
POr-NA	90.0±3°	89.3°	90.9°
N-CF-A	54.2±3°	59.4°	57.7°
POr-ANSPNS	1.0±3.5°	-1.7°	-3.4°
POr-NBa	27.0±3°	31.9°	32.6°
N-CC	57.4±2.5mm	49.4mm	51.8mm
Go-CF	57.1±3.3mm	51.5mm	52.3mm
POr-CFXi	76.0±3°	69.8°	72.1°
P-PTV	-40.0±2.2mm	-34.1mm	-35.0mm
DC-Xi-PM	27.5±4°	30.0°	27.1°
Xi-PM	69.8±2.7mm	53.7mm	56.1mm

Fig. 11
Table.

Fig. 12 à 17
Initial condition and after 2 years.

to finish treatment with it. It is possible to carry on treatment, wait for the eruption of the second molars. If further adjustments to tooth axes is necessary that an be achieved with a few aligners.

CASE 3: NOHAM 9 YEARS AND 9 MONTHS

Orthodontic pathology: Cl II/1, deep bite, mild crowding.

Functional issues: lower lip too tight, mouth breathing, bad posture, head in an anterior position.
When assessing function it is important to note the deep bite. The contact between upper and lower incisors inhibits the correct development of the mandible. The effect of this on the harmony of the face are difficult or impossible to correct later on. This is one of the reasons why early intervention is important.

Fig. 1, 2 et 3
Initial situation - appliance used : U trainer, U trainer rigid.

Fig. 4, 5 et 6
2 years later - treatment continued with U pilot 3.

Fig. 7, 8, 9 et 10
Initial situation and after 2 years.

Fig. 11, 12 et 13
3 years later - appliance : U pilot 3.

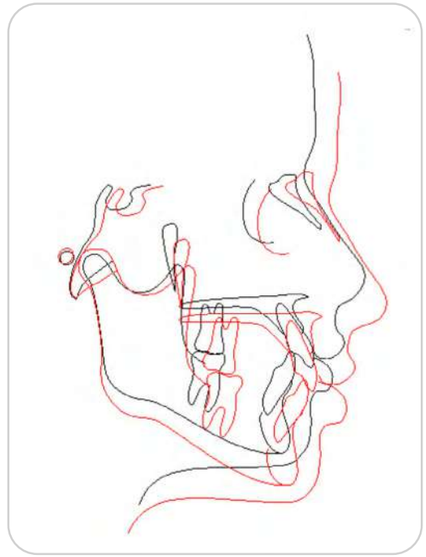


Fig. 14
Tracing.

Ricketts			
	22/01/2022 (CN)	22/01/2022	20/01/2024
6u-6I (OcP)	-3.0±3mm	-1.1mm	-4.3mm
Overjet	2.5±2.5mm	7.1mm	3.0mm
Overbite	2.5±2mm	4.5mm	3.1mm
1I-OcP	1.3±2mm	4.7mm	2.5mm
3u-3I (OcP)	-2.0±3mm	-2.5mm	2.0mm
Max1-Mand1	130.0±6°	131.5°	136.1°
A-NPog	1.8±2mm	0.3mm	2.1mm
ANS-Xi-PM	47.0±4°	44.6°	44.8°
6u-PTV	12.0±3mm	7.7mm	9.2mm
1I-APog	1.0±2.3mm	0.0mm	-0.2mm
1u-APog	3.5±2.3mm	6.5mm	2.5mm
Mand1-APog	22.0±4°	19.9°	18.5°
Max1-APog	28.0±4°	28.7°	23.4°
Xi-OcP	0.0±3mm	0.7mm	-1.1mm
Li-NsPog'	-2.2±2mm	0.8mm	1.4mm
ANS-sto	24.0mm	20.1mm	21.7mm
sto-OcP	-3.4mm	-3.9mm	-2.9mm
NPog-POr	87.0±3°	86.3°	88.6°
NBa-PtG	90.0±3.5°	88.5°	87.6°
MeGo-NPog	68.0±3.5°	70.4°	69.3°
MeGo-POr	26.0±4.5°	23.3°	22.1°
POr-NA	90.0±3°	86.7°	91.0°
N-CF-A	53.4±3°	54.1°	59.7°
POr-ANSPNS	1.0±3.5°	-2.0°	-3.1°
POr-NBa	27.0±3°	27.4°	29.8°
N-CC	55.8±2.5mm	45.7mm	50.2mm
Go-CF	55.7±3.3mm	49.8mm	55.4mm
POr-CFXi	76.0±3°	74.6°	74.5°
P-PTV	-39.0±2.2mm	-31.6mm	-35.3mm
DC-Xi-PM	26.5±4°	29.9°	27.8°
Xi-PM	66.6±2.7mm	53.5mm	57.9mm

Fig. 15
Table.

Functional treatment is part of a two phase approach.

As illustrated by these cases functional trainers are an excellent, effective and easy method of pre-treatment. In the beginning a soft appliance is used and treatment can continued with a semi-rigid one.

The latter can be used if the child chews on the appliance, too. These versions of the appliance help in resolving functional issues, levelling the arches and pre-treat or solve basal issues. The result of this is an easier and quicker second phase and it is easier to maintain the final result.

What is even more important is that the child improves in terms of general condition, sleep, ability to concentrate, digestion, behaviour because with the appliances it is possible to work on mouth breathing, visceral swallowing pattern, bad habits, tight or weak muscles, and a more harmonious muscle function can be obtained.

Fig. 1, 2 et 3
Initial situation.

Fig. 4, 5 et 6
1 year later.

Fig. 7, 8 et 9
After 2 years.

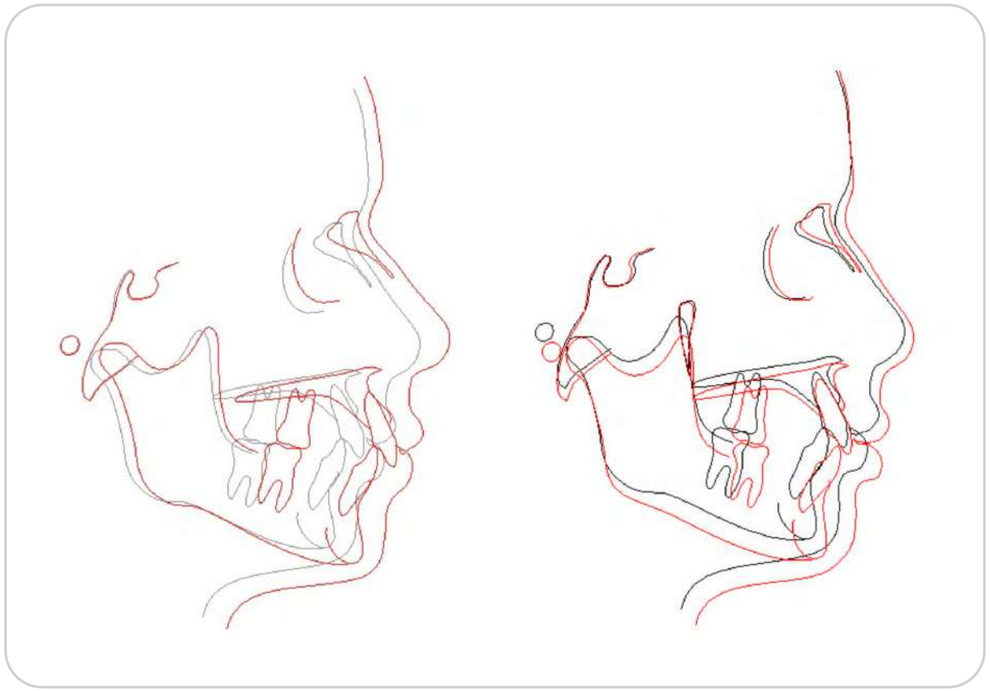


Fig. 10 et 11
Prevision of growth after 2 years and real changes after 2 years.

The child's self esteem is also very important in view of how children are judged by their peers.

Children get into environments very early where bullying is not controlled or punished and they start using social media and other apps where they can become targets. The face of a child growing in a more harmonious orofunctional environment is much less of a target for bullying.

Naturally harmonising function is not limited to early childhood. It is an important part of the treatment teenagers and adults who suffer from snoring, bruxism, clenching or sleep apnea. It has to be appreciated that in the human body everything is related to everything through compensatory mechanisms, even if two issues might seem anatomically very distant.

Thus if function is included in the history taken on the initial appointment and the appropriate appliance is chosen, then not only the position of teeth will change but changes might be noticed in breathing, swallowing and posture. Muscle tensions will be reduced along with less pain in the neck, spine and back, therefore the patient's general health is improved.

The principle *nil nocere* is thus supported.

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A case of Angle Class II malocclusion with significant gummy smile in adult

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INTRODUCTION

The patient was a clinical psychologist, 28 years and 6 months old at the time of the initial examination. The chief complaint was a significant gummy smile, bilabial protrusion, and crowding.

FACIAL APPEARANCES (FIG.1)

At full smile, a significant gummy display of 8 mm was observed. At lip closure, she exhibited bilabial protrusion in relation to the E-plane with a mentalis habit. The interlabial gap at repose was 8.5 mm.

Fig. 1
Facial appearances.

Fig. 2
Intraoral findings.

INTRAORAL FINDINGS (FIG. 2)

The lateral occlusion was Class I on the right and Class II on the left. The ALD was -3 mm in the upper and -4 mm in the lower arch. The arch widths of the first molars in the upper and lower arches were 35 mm, respectively.

Four third molars were present. The upper denture midline coincided with the facial midline, while the lower denture midline was shifted to the left.

X-RAY FINDINGS (FIG. 3, 4, 5)

CBCT revealed a sufficient amount of cortical bone for mild transverse expansion around the upper and lower molar roots in the coronal section.

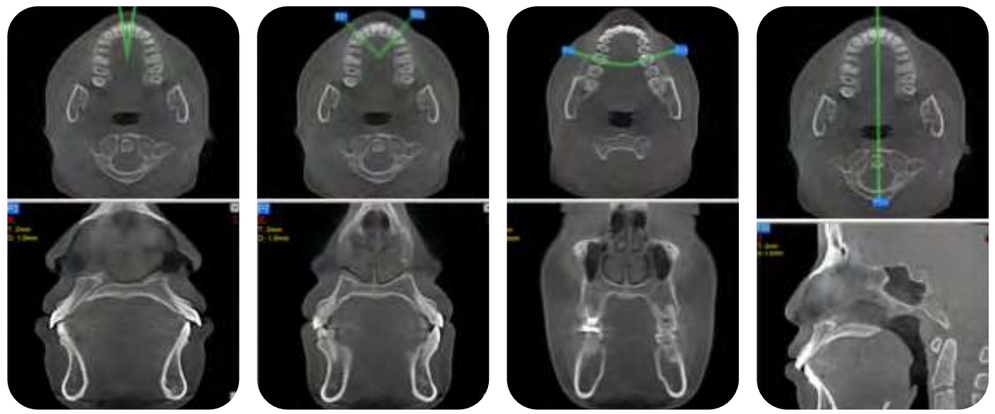
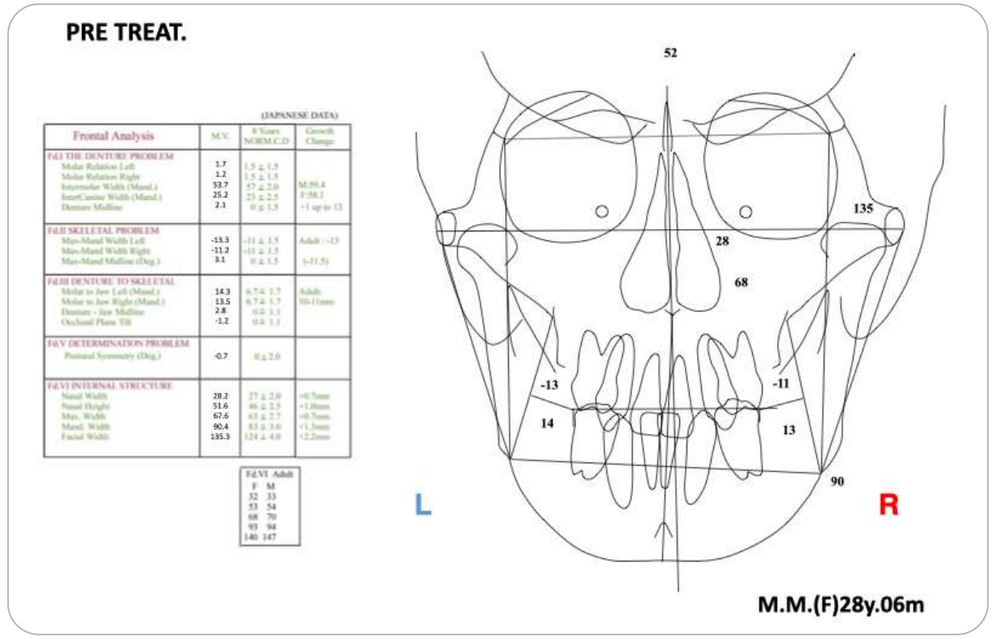


Fig. 3a
Radiographic results.

Fig. 3b
Radiographic results – continued.



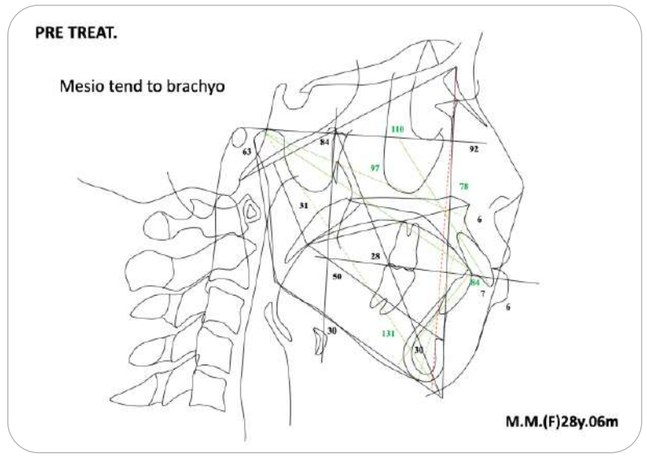


Fig. 4 et 5
Radiographic results – end.

Additionally, the sagittal cross-sectional image of the upper incisors indicated a distance between the upper incisor roots and the floor of the nasal cavity, making it possible to intrude the upper incisors. The frontal cephalogram showed a slight mandibular shift to the left.

The lateral cephalogram indicated a mesiofacial pattern with a tendency toward brachycephaly. Based on the Nasion-perpendicular (McNamara line), prognathism was present in both the upper (Point A) and lower jaws (Pogonion).

In terms of denture description, significant bimaxillary protrusion was observed, with an 85° condylar incisal angle (McHorris angle) and a 105° interincisal angle, indicating labial tipping. Soft tissue issues included bilabial protrusion, a significant gummy smile, and lip incompetence.

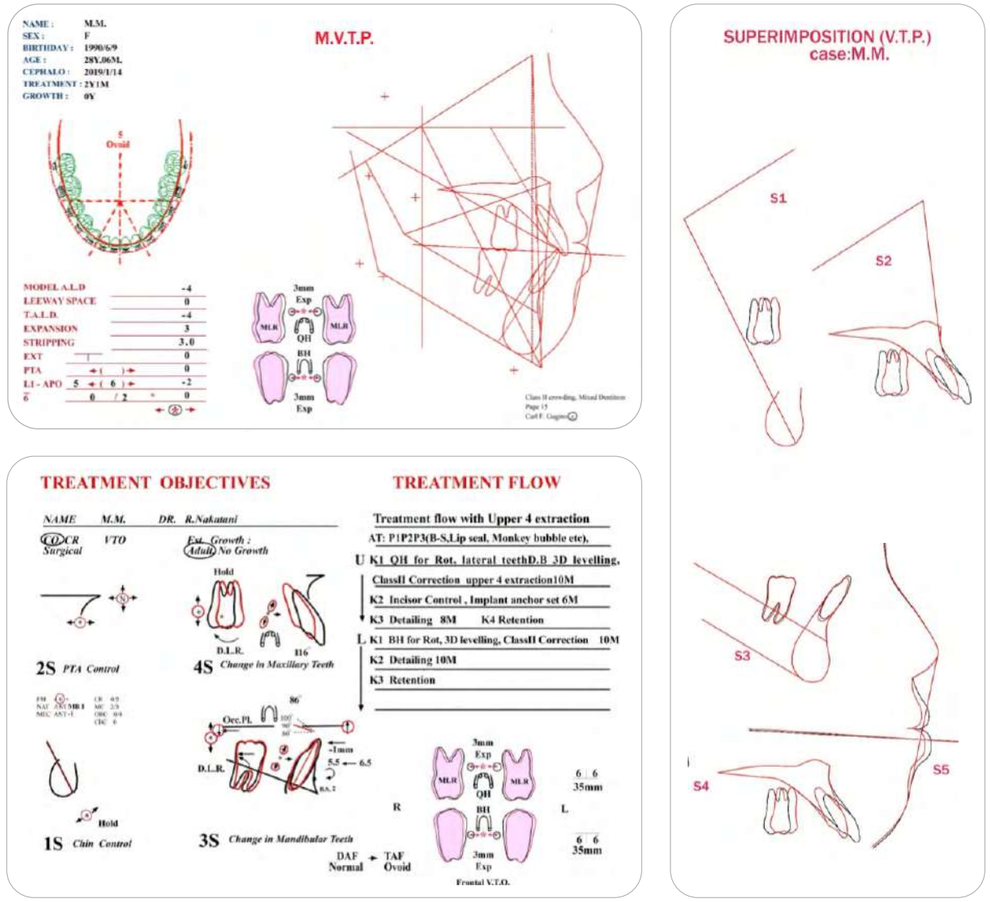


Fig. 6 à 8

CLINICAL EXAMINATION

Anterior tongue thrusting and lip-sucking habits were observed.

TREATMENT PLAN (FIG. 6, 7, 8)

The patient was treated with the extraction of two upper premolars only, resulting in a Class II finish occlusion. For transverse control, the upper and lower first molars were expanded by 3 mm each using QH and BH. It was necessary to apply anchor screws to the upper anterior teeth (between teeth 1 and 2) to reduce the significant gum display at smile, as indicated in the VTP. The objective was to rotate the lower occlusal plane counterclockwise anteriorly, around the depressed position of the upper anterior teeth.

TREATMENT PROCEDURES (FIG. 9–14)

> May 2019

Treatment started with QH on the upper arch, BH on the lower arch, and brackets on the posterior teeth.

Fig. 9

Fig. 10

Two upper first premolars were extracted, followed by upper cuspid retraction. (Fig. 9).

December 2019
A torquing contraction UA was fitted on the upper arch to control intrusion, retraction, and torque of the upper anterior teeth. (Fig. 10).

> June 2020

Once the anterior teeth were under control, CBCT and a lateral cephalogram were taken to re-confirm the distance between the upper anterior teeth and the nasal floor. Implant anchors were installed between teeth 1 and 2 in the upper arch, and intrusion continued. (Fig. 11).

> November 2020

As vertical control of the upper incisors was established, the posterior teeth were brought together, and the upper occlusal plane was determined.

Fig. 11

Fig. 12

The lower arch was coordinated with the upper arch using a Bite Closing UA on the lower arch from the second molars, which were upright under vertical control, aligning the occlusal plane of the upper arch. (Fig. 12)

> Figures 13 and 14
The latter half of the treatment process, after the placement of implant anchors, is shown.

> May 2021
All orthodontic devices were removed.

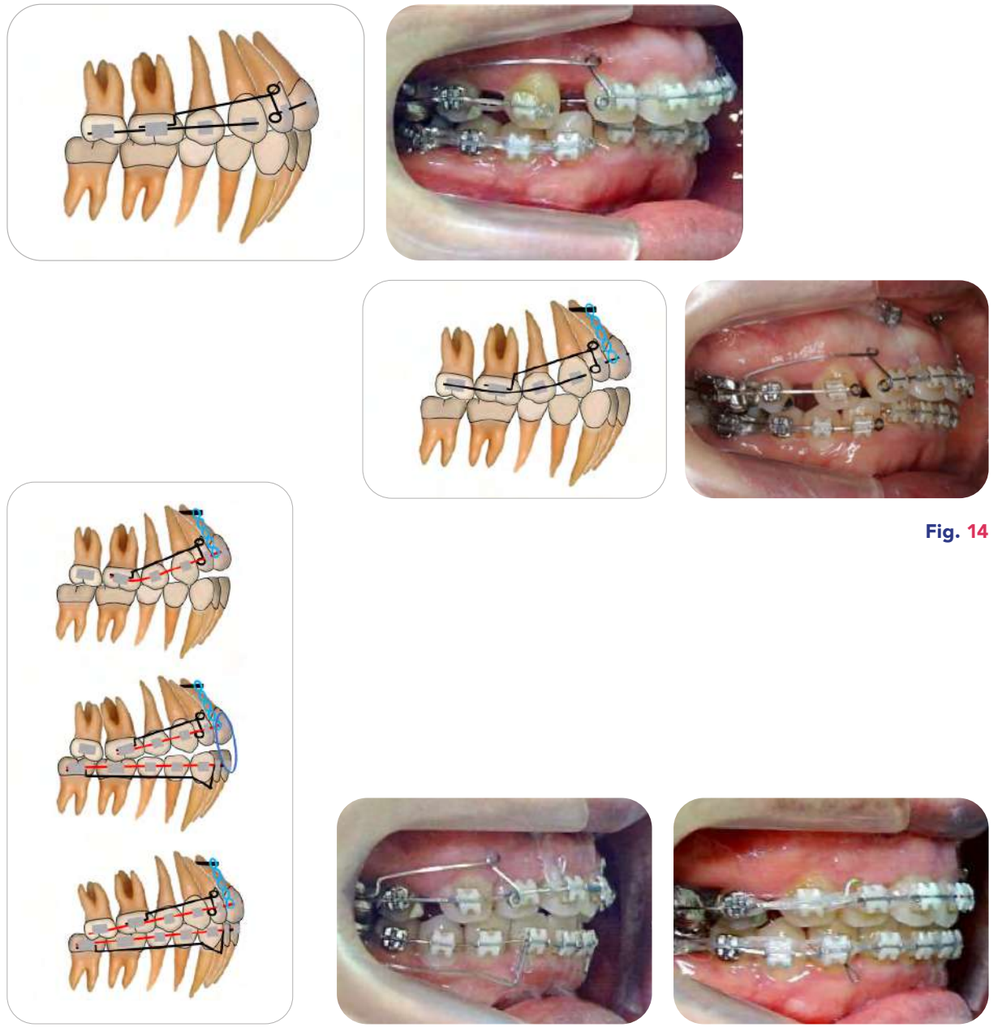


Fig. 14

Fig. 15

TREATMENT RESULTS (FIG. 15–20)

The treatment period lasted 2 years and 1 month. A stable and functional orthodontic occlusion was achieved, and mandibular movement in anterior and lateral guidance was performed smoothly without discomfort (Fig. 15). The significant gummy smile before treatment was reduced from 8.5 mm to 2 mm, as shown in the facial photographs.

The bilabial protrusion with a mentalis habit was significantly improved in the lateral photographs, resulting in a harmonious soft tissue profile. (Figs. 16, 17).

Fig. 15

Fig. 16

Fig. 17

The superimposition of the lateral cephalograms before and after treatment showed that the facial axis was reduced by 1°, and the upper incisors were actively intruded by 6 mm.

The occlusal plane was rotated counterclockwise around the axis of the upper incisors, in accordance with the treatment objectives of VTP. (Fig. 18).

Post-treatment CBCT showed no negative findings such as root resorption. (Fig. 19).

Three years after treatment, the patient maintained a good occlusion (Fig. 20).

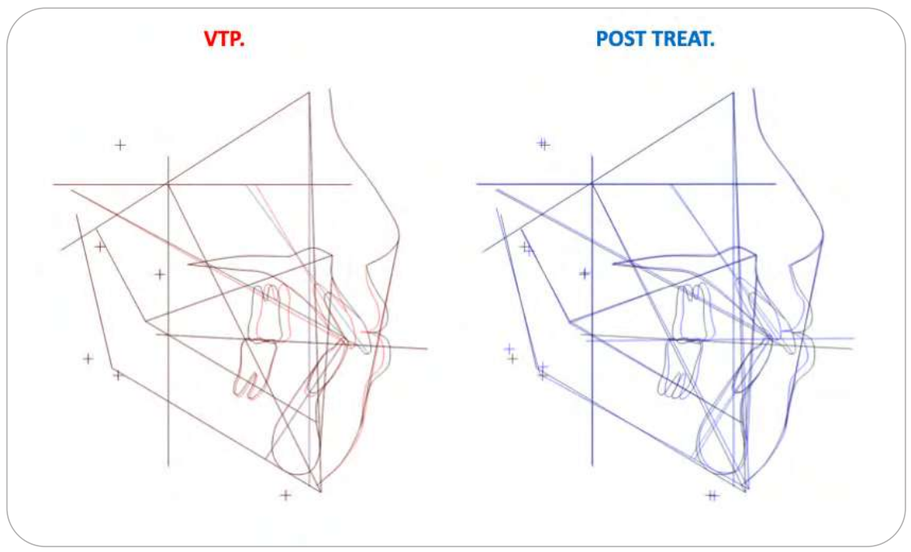


Fig. 18

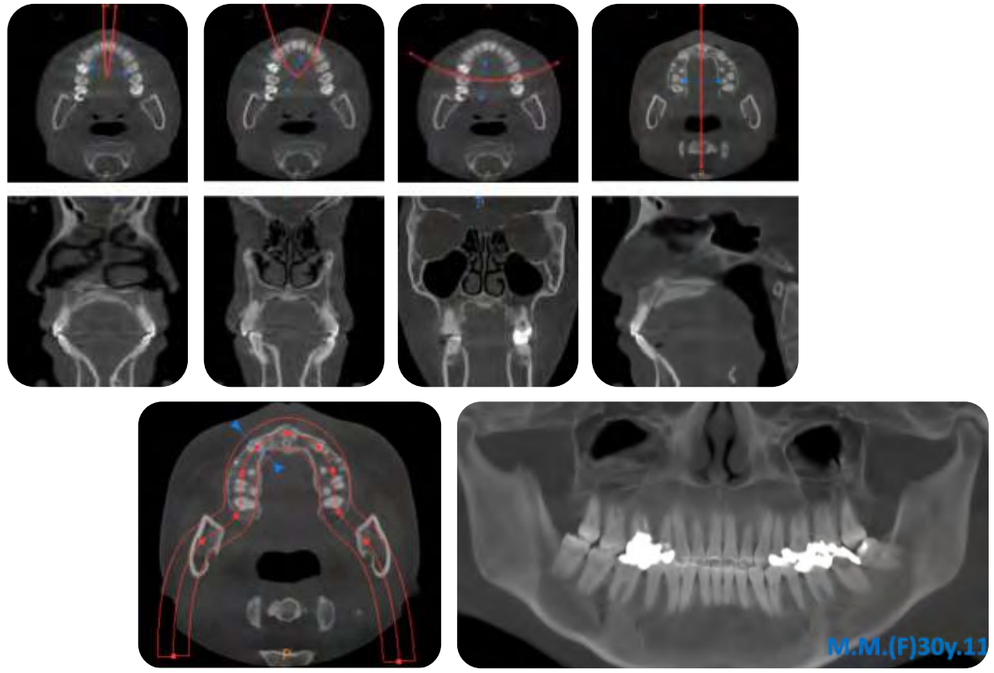


Fig. 19

Fig. 20

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In memoriam

Pascal Herrbach (1939–2025)

M. Delamaire, C. Gugino, A. Chauvois et P. Herrbach, Rennes, 1990.

Lyon, 2010.

Pascal was a leading specialist in dentofacial orthopedics for us in eastern France.
He was always keen to pass on his knowledge and mentored many students in Strasbourg. The basic arch and quad-helix adjustment held no secrets for us. As president and treasurer of SBR East, he introduced us, along with Daniel Rollet, to this wonderful bioprogressive philosophy.
Life leaves its mark on all of us. A passionate, demanding, and sometimes tough teacher, Pascal, known as Mr. Herrbach, became an ally and a source of support for our new SBR East team when Daniel left us. We hope to be worthy successors.

Dr Mireille Biegel and the entire SBR East team

A friend and an outstanding teacher, a pillar of bioprogressive dentistry, has left us.
If we had to choose one person to represent the meaning of the word friendship, Pascal would certainly be at the top of the list. For many years, he shared the life of our society, both festive and studious.
Even in recent years, he would call at least once a year, just to see how we were doing, but also to tell us to continue uncompromisingly with the transmission of the bioprogressive concept.
Pascal remains a friend who will be impossible to forget.

Dr Jean-Luc Ouhioun

Typodont inter-university, Strasbourg, France, 2018.

Pascal Herrbach assisted Michel Delamaire for many years in teaching the bioprogressive concept.
He was his right-hand man throughout the CERTOB courses they organized to welcome Carl Gugino with the groups that followed one another in Rennes, and we had the pleasure of seeing this friend again at the SBR congresses. Michel Delamaire said of him that he had "gold in his hands" because he was so talented at bending arches.
He joined us to supervise the interns during the Interfac typodont that took place in Strasbourg in 2018, and it was only natural that he was an honorary member of the SBR.
Always up for a party, with his tongue-in-cheek sense of humor, he was quite a character, and I had the pleasure of inviting him to the SBR's 50th anniversary celebration in Reims, where he was able to reconnect with his Japanese friends whom he had met many times over the years.
We knew him for 40 years, sharing trips together to the US, Japan, Italy, and the islands, and many meals, the most memorable of which took place at "Chez Yvonne" in Strasbourg... What wonderful memories!

Dr Patrick Guézénec

Anne-Marie Caubert-Doniat and Pascal Herrbach, Reims, 2023.

Pascal Herrbach with Patrick Guézénec, Édith Lejoyeux et Jean-Luc Ouhioun.

It is with great sadness that I take the liberty of writing these few lines in memory of my time working with Dr. Pascal Herrbach in the 1970s at his exclusive orthodontic practice:
Pascal welcomed me and his team, who shared the same high standards and rigorous clinical organization, to perfect the training I had begun during my studies with Professor Lacoste, under the guidance of Dr. William Bacon, in the Ricketts bioprogressive technique.
His dexterity and skill in performing a canine retractor with his hands behind his back in record time would have amazed many!
His presence in Reims at the 50th anniversary of the SBR was a great moment of recognition for him by those who knew him, and he shared with us his pride in having been able to contribute to the organization for many years.
Solicited by the management team of the CECSMO and then the Strasbourg internship program, he taught this discipline and his passion, which he had always shared with Dr. Karl Gugino, for Dr. Ricketts' bioprogressive philosophy.

Dr Anne-Marie Caubert-Doniat

The 50th anniversary of the SBR in Reims, with Drs Nezu, Nagata, Tomura and the Japanese delegation.

Orthodontic treatment of an open bite case due to progressive mandibular condylar resorption (PCR)

Dr Takashi **Nezu**
DDS, PhD
Clinique Nezu Orthodontics,
BSC (Japan)
takashinezu@nezuortho.com

INTRODUCTION

The patient had completed her orthodontic treatment at age of 27 years and 5 months at our clinic in 2005 with extraction of upper and lower first premolars (Figures 1, 2, 3, 4,).

Fig. 1

Fig. 2

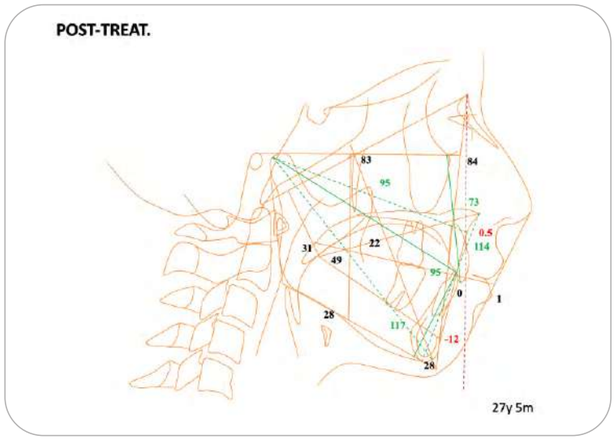


Fig. 3

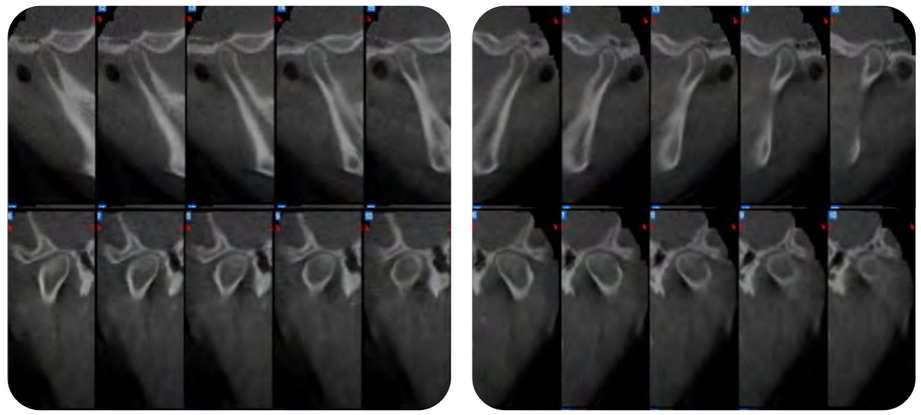


Fig. 4

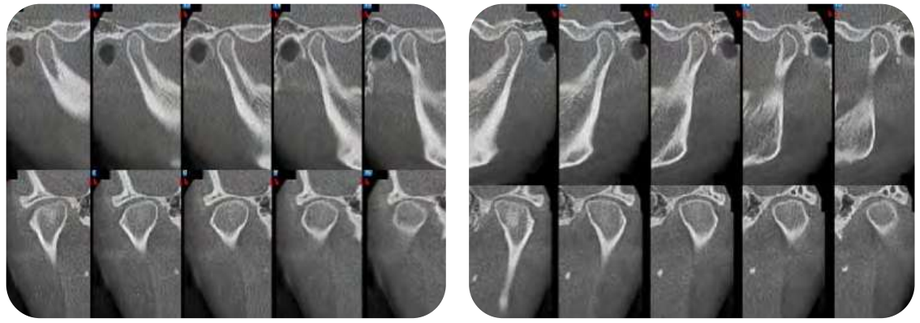


Fig. 5

In 2008, she developed bilateral TMJ arthrosis and underwent splint therapy at a TMD specialist, but there was no improvement (Fig. 5).

However, around 2013, she developed severe open bite (Figure 6), and the TMJ joint was again checked with CBCT, which revealed progressive condylar resorption (PCR) 1) (Fig. 7).

She was then followed by a TMD specialist until the condylar resorption settled down, and re-treatment was started in 2018 at our clinic.

Fig. 6

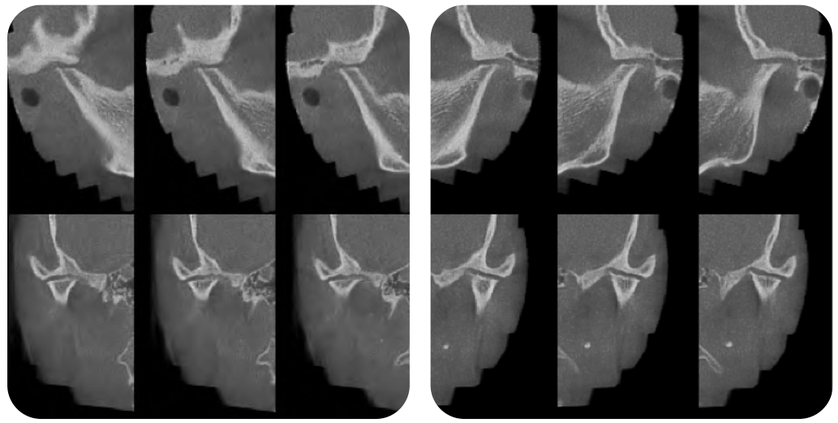


Fig. 7

INITIAL FACIAL VIEWS (FIG. 8)

Frontal view shows no significant deviation of the soft tissues in the frontal face.
The lateral view shows a convex-type lateral face with a marked retrognathic mandible. Perioral lip strain was observed at lip closure.

INTRAORAL VIEWS (FIG. 9)

The interrelationship on the posterior teeth is Class II on the right side and Class I on the left side, and there is a marked open bite with only the second molars in occlusal contact.

Fig. 8
Vues faciales initiales.

Fig. 9
Vues intrabuccales.

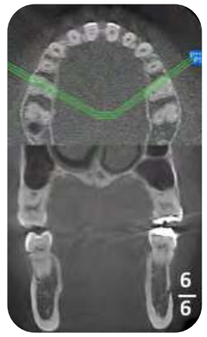
RADIOGRAPHIC FINDINGS (FIG. 10, 11, 12)

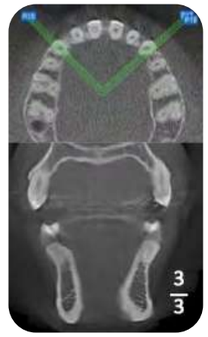
According to CBCT, the amount of alveolar bone around the roots of the posterior teeth was insufficient, so it was difficult to expand transversely.
No further significant bone resorption was observed on the condyles.
The frontal cephalogram showed a slight mandibular shift to the left.

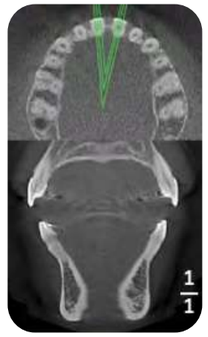
The lateral cephalogram showed a severe Dolico facial pattern with 11° clockwise rotation and significant mandibular retrusion compared to the Facial axis at 2005. 2)
Denture position showed that L1 to APO was +5mm and McHorris angle 3) was 74° indicating protrusive.

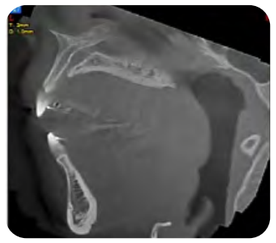
CLINICAL EXAMINATION

Anterior tongue protrusion habit was observed.









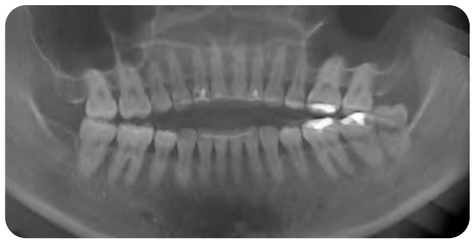


Fig. 10
Résultats radiographiques.

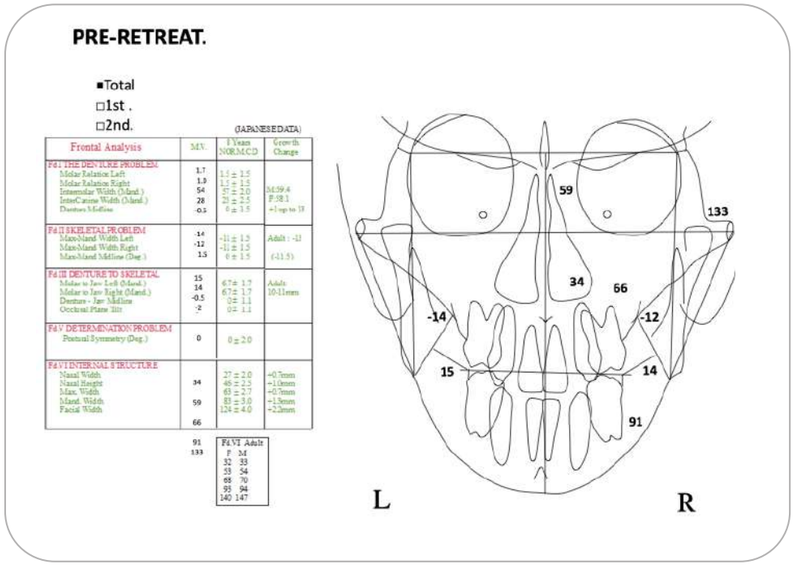


Fig. 11

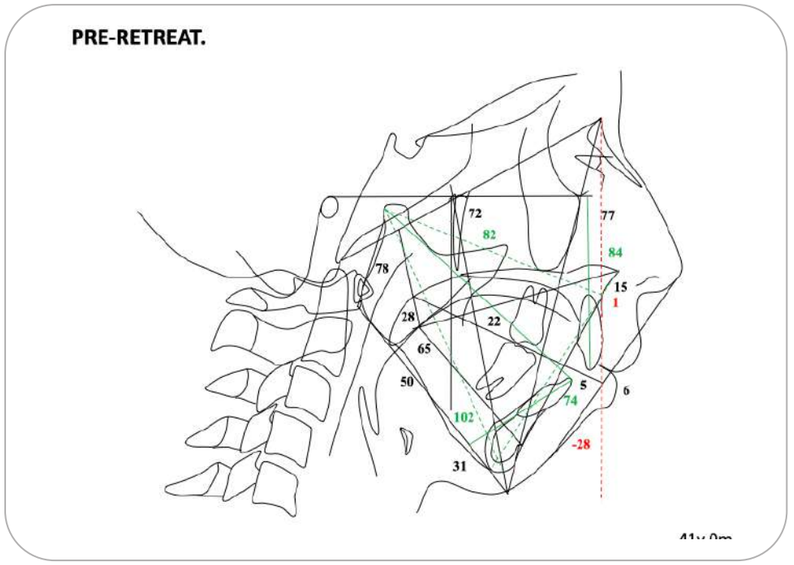


Fig. 12

TREATMENT PLAN
(FIG. 13, 14, 15, 16, 17)

Due to the fact that counterclockwise rotation of the mandible was required in this case, significant intrusion of the maxillary molars was planned 4). In addition to the ordinary upper and lower multi-brackets, TPA (Trans-palatal arch) was inserted to the upper molars and also the implant anchors were installed in the buccal regions between the 6 and 7 in order to intrude the upper molars 5).
The TPA was set with anti-torque against undesirable torquing effect from the anchor.

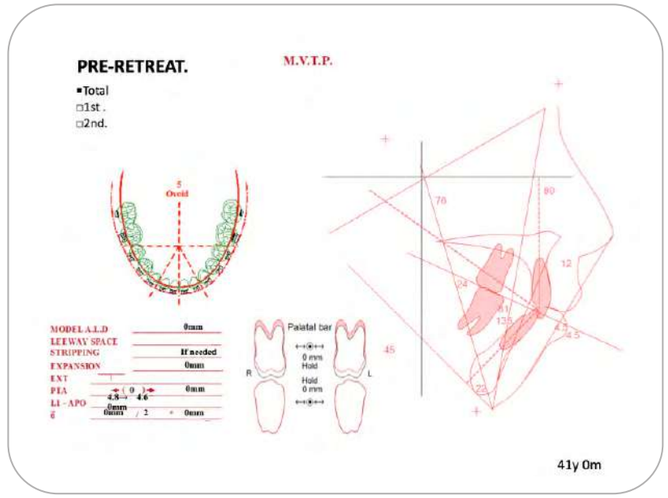


Fig. 13

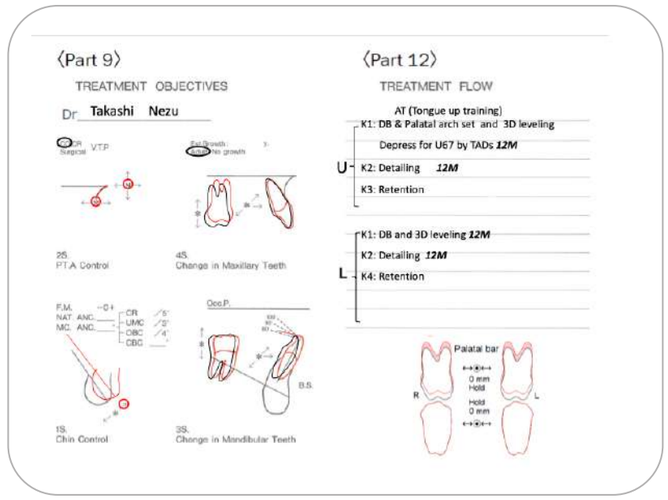


Fig. 14

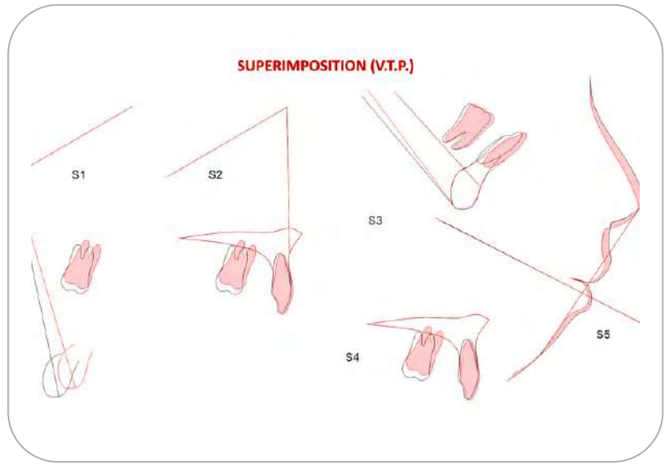


Fig. 15

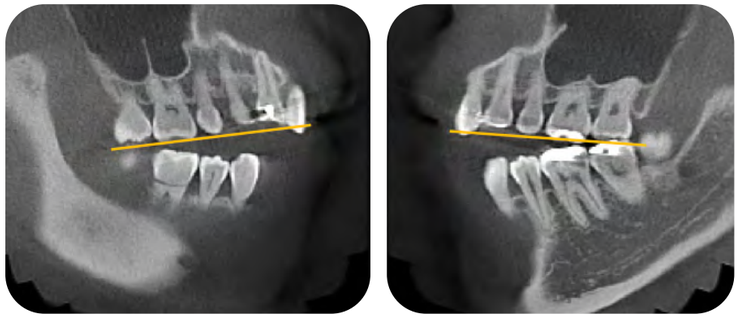


Fig. 16

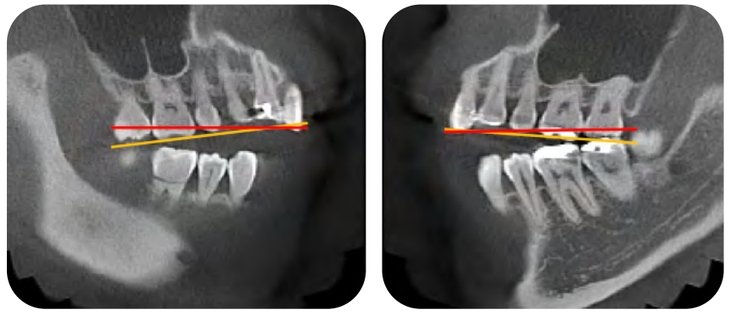


Fig. 17

> November 2018 (Fig. 18)
Treatment started with TPA and multi-brackets.

> January 2019 (Fig. 19)
Implant anchors were installed on the buccal area between 6-7 and intrusion of the upper molars was initiated.

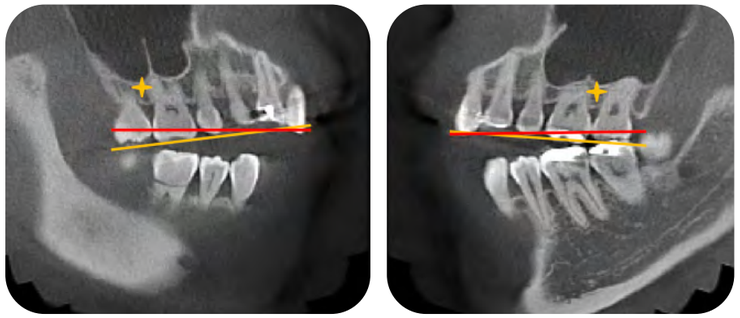


Fig. 18

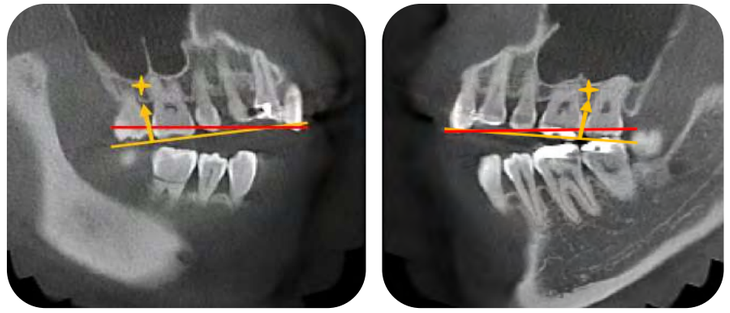


Fig. 19

> July 2019 (Fig. 20)
Bite closing effect due to upper molar intrusion was observed.

> February 2020 (Fig. 21)
Intrusion of upper molar was discontinued and occlusal stability was confirmed.

> June 2020 (Fig. 22)
Removal of device

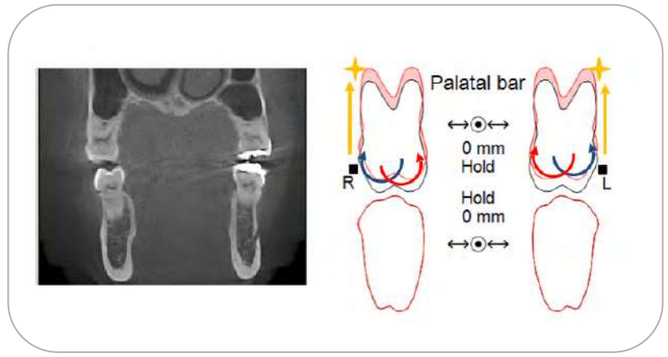


Fig. 20

Fig. 21

Fig. 22

TREATMENT RESULTS
(FIG. 23 À 28)

The treatment period was 1 year and 8 months. The stable occlusion was established, and both anterior and lateral guidance during mandibular movement could be performed without any problem.

The lateral facial view showed that the sublabial contraction was relieved significantly and lip closure at repose was transformed into a harmonious face and mouth.

Fig. 23

Fig. 24

Fig. 25

The resulting lateral cephalometric superimposition showed that the Facial axis was closed 3°, indicating that the maxillary molars intruded as expected.

Post-treatment CBCT showed no bone housing problems and no further resorption of the condyles.

Fig. 26

Fig. 27

Fig. 28

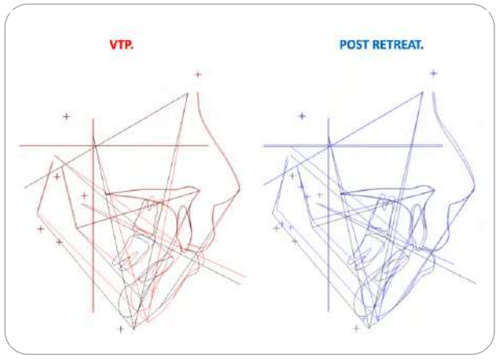
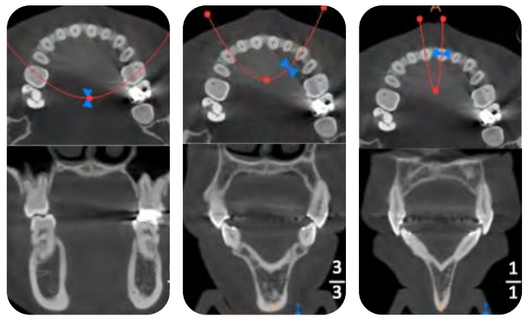


Fig. 29



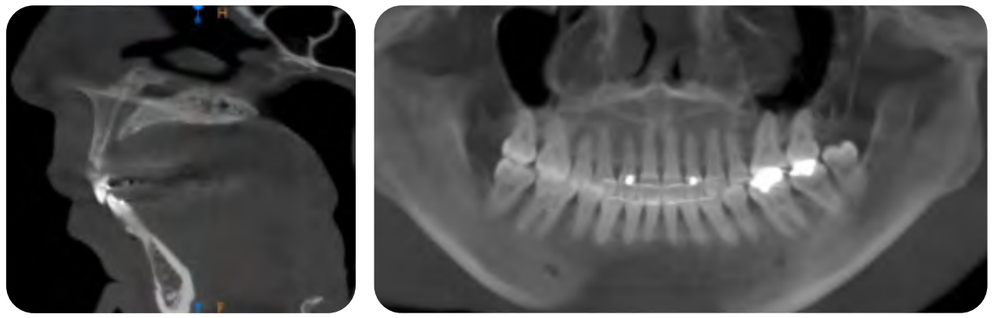


Fig. 30

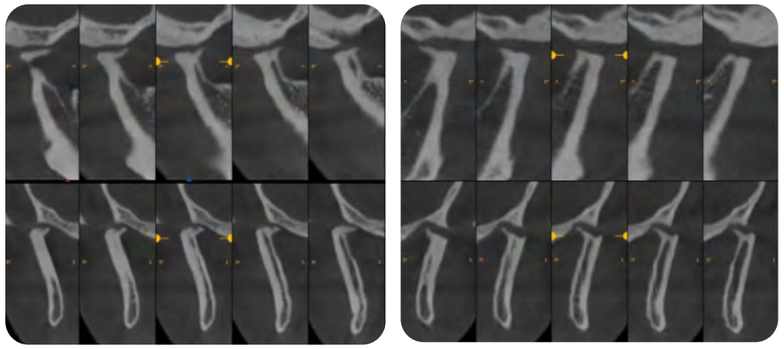


Fig. 31

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Early Orthodontic Intervention:

A Critical Strategy for Guiding Craniofacial Growth in Skeletal Class III Malocclusion with Maxillary Retrognathia

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INTRODUCTION

Orthodontic treatment is traditionally initiated during the mixed dentition phase, typically between the ages of 8 and 10. However, recent advancements in craniofacial developmental biology, applied biomechanics, and orofacial neurophysiology challenge this conventional timeline—particularly in cases of skeletal Class III malocclusion characterized by maxillary retrognathia.

This type of skeletal discrepancy, often detectable during primary dentition, is defined by underdevelopment of the maxilla in the sagittal and transverse planes and is typically associated with anterior crossbite. If left untreated, these conditions tend to progress into complex, often irreversible imbalances with significant functional, respiratory, aesthetic, and psychosocial consequences. Delayed intervention frequently leads to the necessity of orthognathic surgery in adolescence or adulthood.

Initiating orthopedic-functional therapy before the age of six—during a period of high tissue plasticity—offers a critical window to influence craniofacial growth in a favorable direction and potentially prevent the need for future surgical intervention.

CRANIOFACIAL GROWTH DYNAMICS: FUNDAMENTAL BIOLOGICAL INSIGHTS

Craniofacial development in early childhood is rapid and non-linear. It is now well established that:

- Approximately 60% of facial growth is completed by age 4,
- About 90% is achieved by age 12,
- The maxilla reaches nearly 82% of its adult dimensions by age 5.

In skeletal Class III malocclusion with maxillary retrognathia, growth deficiencies can be observed as early as the primary dentition stage. These deficits impair midfacial development, nasal breathing, tongue posture, and occlusal relationships. Early interceptive treatment aims to correct these issues before the onset of accelerated mandibular growth, which typically begins later and lasts longer, further intensifying skeletal imbalance.

FUNCTION AND FORM: THE ROLE OF THE FUNCTIONAL MATRIX HYPOTHESIS

The functional matrix theory, introduced by Moss, posits that function precedes and shapes form. This model is particularly relevant in early malocclusion management.

When mouth breathing, low tongue posture, and atypical swallowing are present, the tongue fails to provide the necessary mechanical stimulation to the palatal sutures. As a result, the maxilla's development is hindered in both the anterior and transverse dimensions.

These early functional disturbances can lead to:
- Excessive vertical development of the lower facial third,
- Orofacial muscular hypotonia,
- Obstructive respiratory disorders, including sleep-related breathing disturbances,
- Fixed anterior crossbite,
- Compensatory postural changes (e.g., forward head posture, cervical hyperlordosis),
- Disruption of global postural balance due to chronic respiratory compensation.

Early functional rehabilitation is therefore essential. By restoring proper tongue posture against the palate and promoting nasal breathing, physiological craniofacial development can be reestablished, along with balanced intraoral pressures.

ANATOMICAL BARRIERS TO FUNCTION: RESTRICTIVE FRENULA AND PHARYNGEAL CROWDING

Certain anatomical variations may aggravate functional imbalances, such as:
- Ankyloglossia (short or fibrotic lingual frenulum),
- Thick upper labial frenulum,
- Tonsillar and adenoidal hypertrophy,
- Low-hanging soft palate or enlarged uvula.

These anomalies restrict tongue mobility, reduce pharyngeal volume, and promote oral breathing, impairing the natural regulation of orofacial posture and function. A multidisciplinary assessment—combining the expertise of an orthodontist, ENT specialist, and speech-language pathologist—is essential for a comprehensive and integrated treatment plan.

OBJECTIVES OF EARLY ORTHODONTIC INTERVENTION: PRINCIPLES AND PROTOCOLS

The goals of early interceptive treatment in skeletal Class III malocclusion include:
- Stimulating maxillary growth in the sagittal plane using orthopedic traction (reverse-pull facemask therapy),
- Enhancing transverse development through controlled palatal expansion,
- Restoring physiological tongue posture (elevated rest position) and reestablishing spontaneous nasal breathing,
- Normalizing essential orofacial functions, such as chewing, swallowing, and speech,
- Reducing the need for future orthognathic surgery.

This therapeutic strategy requires a structured approach, with active involvement from the child's caregivers and a multidisciplinary team. Treatment success depends on adherence to facemask use, consistency in functional rehabilitation, and regular monitoring by the clinical team.

CLINICAL CASE: SKELETAL CLASS III WITH MAXILLARY RETROGNATHIA IN A 4-YEAR-OLD PATIENT

A 4-year-old girl presented with skeletal Class III malocclusion. Clinical examination revealed anterior crossbite, underdeveloped maxillary arch in both transverse and sagittal dimensions, low tongue posture, mouth breathing, ankyloglossia, and a restrictive upper labial frenulum. Treatment protocol included:
- Functional labial and lingual frenectomy,
- Early, targeted myofunctional therapy (focusing on tongue posture, nasal breathing, and perioral muscle tone),
- Age-appropriate assisted palatal expansion,
- Nightly use of a reverse-pull facemask.

RESULTS AFTER 12 MONTHS:

- Stable correction of anterior crossbite,
- Harmonious maxillary development in both planes,
- Restoration of nasal breathing,
- Improved tongue posture and orofacial muscle tone,
- Successful prevention of further skeletal imbalance and potential surgical indication.

DISCUSSION AND FUTURE PERSPECTIVES

Preventing orofacial dysfunctions from an early age promotes optimal craniofacial development and helps reduce the risk of related conditions such as attention deficit disorders, sleep disturbances, snoring, and obstructive sleep apnea syndrome (OSAS). Functional rehabilitation not only improves oral and respiratory function but also enhances cognitive development and overall quality of life.

Fig. 1
Photos from the beginning.

Fig. 2
Early intraoral photos.

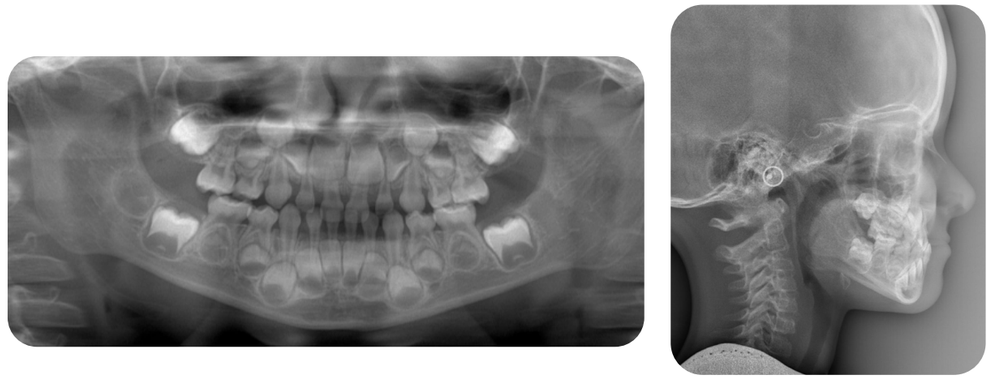

Fig. 3
Panoramic and teleprofile – Beginning.

Fig. 4
Functional control – beginning.

Fig. 5
Photos after interception.

Fig. 6
Intraoral photos after interception.

EARLY INTERVENTION HAS LONG-TERM BENEFITS, INCLUDING:

- Avoidance of dental extractions during later orthodontic treatment,
- Reduced likelihood of maxillofacial surgery,
- Greater long-term stability of orthodontic results.

Recent studies confirm that early interception of skeletal Class III malocclusion leads to favorable outcomes—provided that functional balance is reestablished and craniofacial growth is actively guided. A combination of orthopedic facial traction, transverse expansion, and surgical release of restrictive frenula forms the foundation of this comprehensive therapeutic strategy.

CONCLUSION

Early orthodontic intervention in skeletal Class III malocclusion with maxillary retrognathia is grounded in principles of developmental biology, neurofunctional regulation, and adaptive skeletal growth. It allows for early correction of imbalances and restoration of essential orofacial functions that support healthy facial development.

When implemented during early childhood, this approach significantly reduces the need for extensive orthodontic or surgical interventions later in life. It represents a paradigm shift toward preventive, functional, and interdisciplinary orthodontics, serving the child's overall physical and psychosocial development.

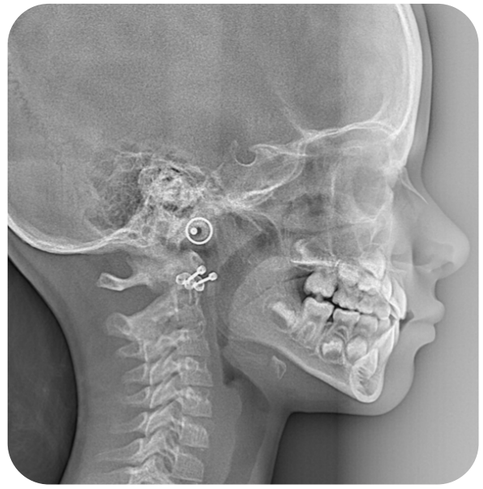

Fig. 7
Panoramic and teleprofile – End.

Mandibular Opening and Clockwise Rotation in the Treatment of Low-Angle Class III Malocclusion

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xxxxx@xxx

CLINICAL AND PARACLINICAL SYMPTOMS

Chief Complaint

A 20-year-old female patient presented to Quang Huy Dental Clinic with the following primary concerns: Spacing between maxillary central incisors, causing aesthetic dissatisfaction when smiling.
Prominent chin and square mandibular angle, contributing to a short, square facial appearance; patient was dissatisfied with her profile. All initial data were collected during the first visit, including: extraoral and intraoral photographs, digital dental models, and radiographic images (panoramic and cephalometric X-rays).

Extraoral Examination

> **Facial type:** Brachyfacial
> **Profile:** Prognathic mandible, concave facial profile, and slight backward head posture — typical characteristics of skeletal Class III.
> **Nasolabial angle:** Acute
> **Smile:** Maxillary incisor display during smiling was approximately 50%, categorized as a low smile line, contributing to a less vibrant smile (Fig. 1).

Fig. 1

Fig. 1

Intraoral Examination

> 2 mm diastema between teeth #11 and #21
> Dental Class III malocclusion: 2 mm discrepancy at both canine and first molar regions
> Overjet: approximately 1 mm;
> Overbite: 2 mm
> All four third molars (wisdom teeth) were present and indicated for extraction at the start of treatment.
> Excessive contact of anterior teeth during function was observed by palpating the labial surface while the patient performed a centric bite — indicating significant occlusal force on the maxillary incisors.

Fig. 2, 3 and 4

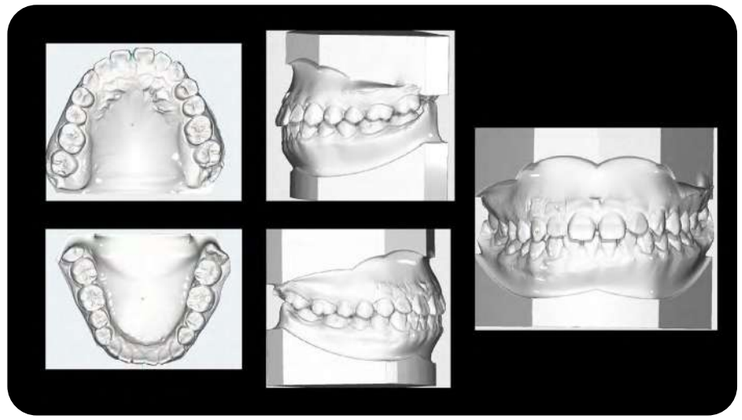


Fig. 5

Radiographic Assessment

Panoramic X-ray (fig. 6)

> All four third molars require extraction to prevent posterior crowding.
> Mandibular molars exhibited mesial tipping.

Cephalometric Analysis

(Ricketts) (fig. 7, 8 and 9).

Fig. 6

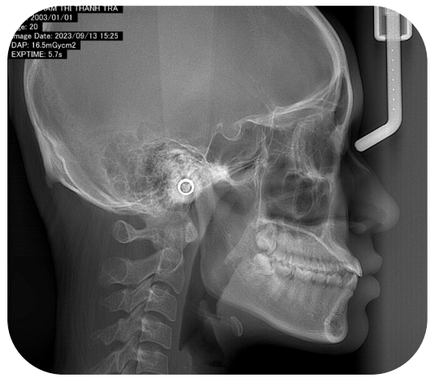


Fig. 7

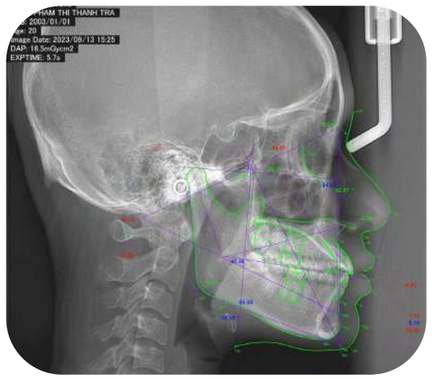


Fig. 8

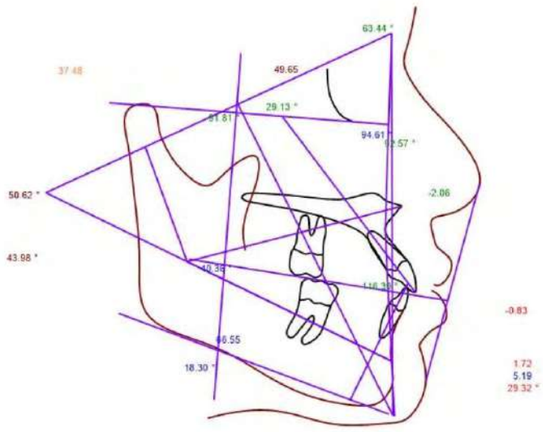


Fig. 9

> Skeletal Class III malocclusion with mandibular prognathism (Convexity = -2,09 mm; Facial Depth = 94.6 °)
> Mandibular counterclockwise rotation (FMA = 18.3°)
> Short lower facial height (LFH = 40.5°
> Brachy facial (Total Facial Height TFH = 50.6°
> Maxillary incisors significantly proclined — a dental compensation for the skeletal Class III
> Mandibular incisors with average proclination

Summary

Skeletal Class III case with mandibular prognathism, low-angle, low vertical facial pattern.

Temporomandibular Joint (TMJ) Evaluation

> No clicking or joint sounds
> Smooth opening/closing path
> No pain on palpation or reported history of TMJ discomfort

DIAGNOSIS

> Skeletal Class III due to excessive mandibular growth, brachyfacial type, short lower facial height, mandibular counterclockwise rotation, and deficient posterior vertical dimension
> 2 mm diastema between upper central incisors (#11 and #21)
> Reduced overjet (1 mm) with excessive anterior tooth contact during mastication
> Low smile line with limited maxillary incisor display III.

TREATMENT PLAN

The treatment plan was tailored to address the patient's primary complaints:

> **Diastema between teeth #11 and #21:** Closed using continuous archwire and power chain via sliding mechanics. However, concerns regarding post-treatment relapse were noted due to excessive anterior occlusal force, likely resulting from the mandibular rotation and reduced LFH. Relapse prevention would require increasing the lower facial height.
> **Mandibular prominence and brachyfacial-profile:** To be managed by clockwise mandibular rotation, which would lengthen the face and reposition the mandible posteriorly via rotation rather than retraction (to avoid condylar compression and potential TMJ dysfunction).
> **Low smile line:** Improved through controlled extrusion of the maxillary incisors. IV.

TREATMENT EXECUTION

> Appliance: Self-ligating brackets, ROTH prescription, slot size 0.018
> Initial Leveling: NiTi 0.014, then NiTi 0.016 during the first 2 months
> Third molars: Extracted in the second month of treatment.

Fig. 10

Functional Guidance with Overlay in Orthodontics in this case :

Intermaxillary Coordination

Archwire sectioning and 3/16", 3.5 oz interarch elastics used to engage cusp interdigitation for anterior and posterior teeth, creating space using the R4,5 overlay (fig. 11, 12 and 13).

Changes in the facial appearance were noticeable just one month after placing the overlay, with a visibly longer face and clear clockwise rotation of the mandible (fig. 14).

Overlay at R4,5 was removed after engagement, and interarch elastics continued (fig. 15, 16 and 17).

After 5 months of overlay technique, interdigitation was achieved. However, X-ray follow-up showed LFH regression due to intrusion of the premolars supporting the overlay (fig. 18).

Fig. 11, 12 and 13

Fig. 14

Fig. 15

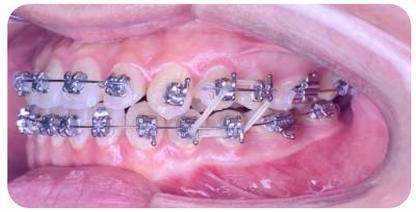


Fig. 15, 16 and 17

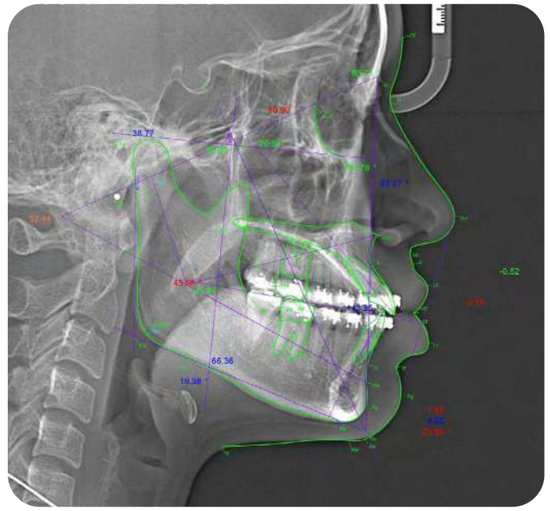


Fig. 18

A second overlay was implemented. The GEAW technique was applied using 0.016 × 0.022 Gummetal wire.

> Extrusion of upper molars (teeth #6 and #7) to flatten the POP and increase vertical height.
> Simultaneous extrusion of upper incisors to improve smile esthetics.
> Interarch elastics: 3/16, 6 oz.

Fig. 19 to 24

To achieve a Class I relationship of the canines, the overlay was further raised for the third time. Procedures followed the same protocol as in the previous two overlay phases (fig. 25, 26 and 27).

Fig. 25, 26, 27

Extrude upper molars (#6 and #7) using activation bends. Interarch elastics were applied in a box configuration between upper and lower molars (#6 and #7), and interarch box elastics between U1–U2 and L1–L2, using 3/16", 6 oz elastics.

> Overlay was gradually removed over 5 months (1 mm/month), with extrusion and positive torque activation on teeth #4 and #5 bilaterally.

> 3/16", 6 oz interarch elastics were worn between U1 and L1, combined with vertical elastics to extrude the first and second premolars (teeth #4 and #5) in both arches.

Premolar extrusion phase: 4 months

> Finishing phase: Maintained with a finishing archwire, size 0.016 × 0.022 stainless steel for 2 months.

Fig. 28 to 32

Fig. 33, 34 and 35

Brackets were removed, and the patient was retained with an upper wraparound retainer.
Total treatment duration: 18 months.

Fig. 36 to 40

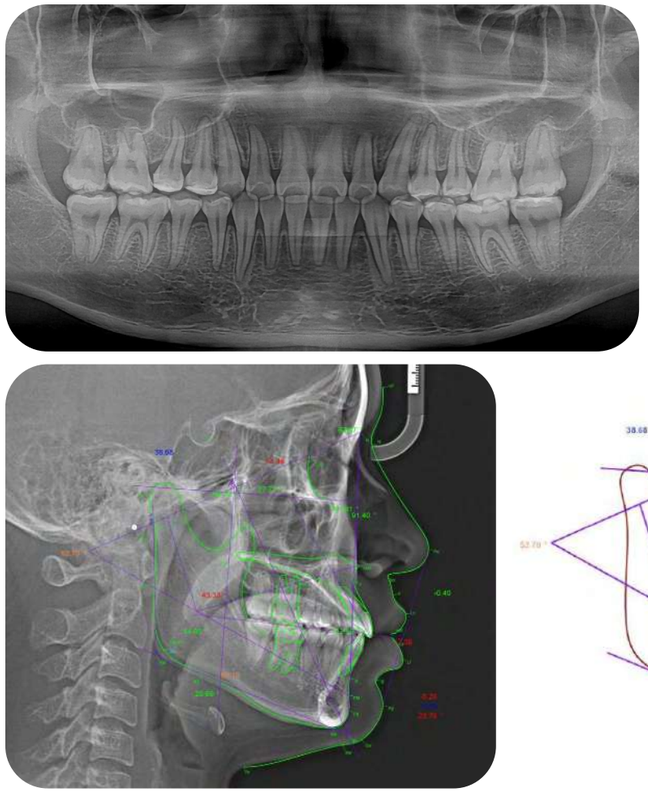
Fig. 41 to 46
Extraoral Photographs After Orthodontic Treatment.

Smile Line: Before and After Treatment

It was observed that the smile line improved, with an increased display of the maxillary central incisors — approximately 80% incisor display, which is considered within the normal esthetic range.

Fig. 47 and 48

Post-treatment Radiographs and Ricketts Analysis:



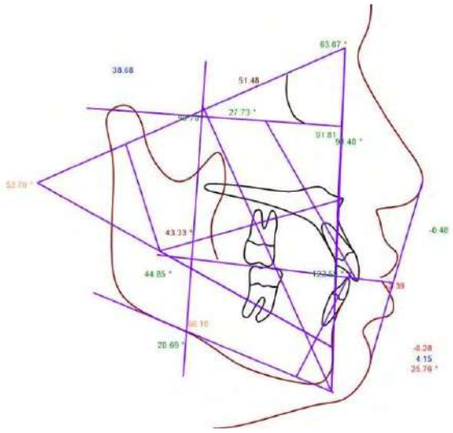
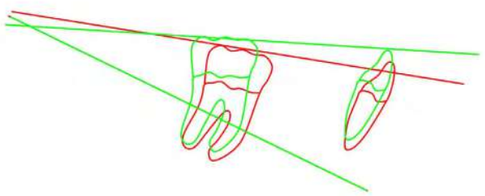
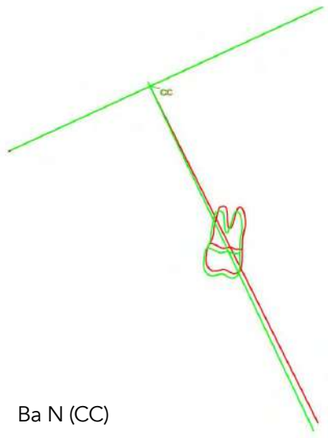



Fig. 49 to 52

SUPERIMPOSITION OF CEPHALOMETRIC X-RAYS
Before and After Orthodontic Treatment :

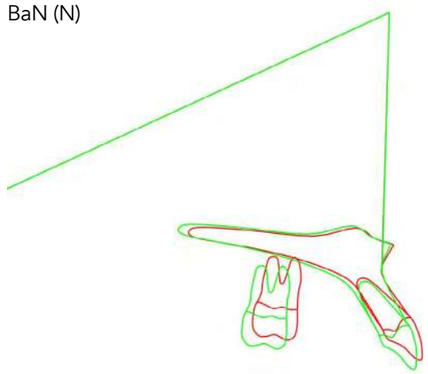


Xi-Pm

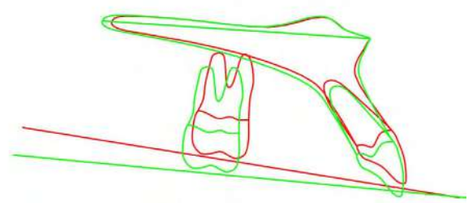


Ba N (CC)

BaN (N)



ANS – PNS



THREE-MONTHS FOLLOW-UP

Intraoral Photographs:

Fig. 53 to 56

We observed that the patient had an aberrant maxillary labial frenum attachment, which is considered a risk factor for relapse of the midline diastema.

However, the patient refused to undergo a minor surgical intervention (frenectomy).

Extraoral Photographs:

Fig. 57 to 62

Cephalometric :

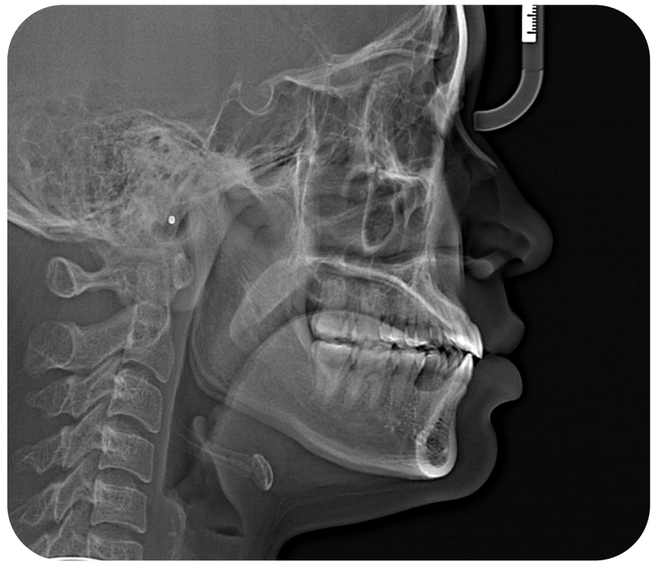


Fig. 63

TREATMENT RESULTS

Class I canine and molar relationships were achieved, with a coincident dental midline. The midline diastema and all residual spacing were completely closed.

> The mandible was rotated clockwise, leading to an increase in lower facial height (as evidenced by increases in FMA and LFH).
> However, due to postpartum weight gain, the facial improvement was not clearly noticeable in photographs.
> Skeletal relationship improved as a result of mandibular rotation, with convexity increasing from -2.09 mm to -0.4 mm.
> The smile line was elevated, with greater display of the maxillary anterior teeth during smiling, thereby enhancing facial and smile esthetics.

Fig. 64 and 65

DISCUSSION

> In this case, we observed that the patient had a short lower facial height with a counterclockwise (closed) mandibular rotation pattern. Additionally, there was undereruption of the posterior teeth, which appeared to be the primary etiological factor contributing to the midline diastema. However, an aberrant maxillary labial frenum attachment was also identified as a potential risk factor.
> The treatment objective focused on clockwise mandibular rotation by utilizing functional guidance from overlays placed in the premolar regions (teeth #4 and #5 in both arches). Subsequently, maxillary molars were extruded, and mandibular molars were uprighted into the space created posteriorly by the overlay. The maxillary anterior teeth were also extruded, improving incisor display during smiling.
> The temporary overlay was fabricated following these steps:
    - Facebow transfer
    - Centric relation record, registered using specialized CR wax
    - Mounting casts on a semi-adjustable articulator
    - Opening the incisal pin to increase LFH (1 mm increase in incisal pin corresponded to approximately 0.5° increase in LFH)
    - Overlay was designed and constructed directly on the articulator
    - The occlusal record was taken with bite registration silicone, and a bite test was performed intraorally to ensure comfort. The patient reported no TMJ or muscle discomfort.
    - The wax overlay was duplicated using Elite Transparent silicone, and the final composite overlay was transferred intraorally.
    - The patient was able to perform normal functional mandibular movements and mastication with the overlay in place.
    - The GEAW technique was then implemented to intrude and extrude teeth as guided by the occlusal platform provided by the overlay.

The following are selected images illustrating this process:

Facebow transfer

Overlay

CONCLUSION

An important treatment objective in managing Angle Class III malocclusion with a closed bite is to achieve clockwise rotation of the mandibule.
The overlay, fabricated on an articulator, serves as an effective tool to immediately facilitate mandibular rotation. Combining the overlay with the GEAW technique enhances the overall treatment efficacy.