ORTHODONTICS BIOPROGRESSIVE
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SBR
SOCIETE BIOPROGRESSIVE RICKETTS

Dear colleagues and friends,

Two major events in the second half of 2025: First, some sad news: our first honorary president and founder of the Ricketts Society, Carl Gugino, passed away in his 96th year, after a long and intense life. We benefited from his teaching for over 40 years, and we look back on his life in the tribute paid to him in this issue. We hope to pay tribute to him in person for those who knew him, as a prelude to our next conference.

The second event was our conference in Colmar, perfectly organised by the 'East Sisters' Mireille Biegel, Laure Damery, Gaelle Hartner and Sophie Laquille. I must admit that the announcement of the theme at the Rennes conference had made me a little apprehensive, fearing that the subject would not be sufficiently orthodontic. Well, some people were wrong: THOSE WHO DIDN'T COME!

We learned a lot of things that are valuable in our practices and in our daily lives. The subject was innovative, original and risky, and it was an enriching conference in every aspect, with fascinating speakers, so a big congratulations to them and to the SBR East for taking this risk and organising such a high-level conference. It is impossible to escape all these endocrine disruptors, but let's focus on a few steps we can take to improve our lives and those of our patients.

For example, planting a tree at the start of each treatment or asking our patients to return their aligners after use: they are contaminated waste, filtered tap water is better than water in plastic bottles, plastic packaging is not the best for our food, a retention bond releases toxic products, found in saliva, during the 24 hours following the bond etc. etc. ... and many other small things ... small streams make big rivers.

Not to mention the 2025 Orthodontics days, which brought together more than 2,000 practitioners and during which the SBR, as always, took part in conferences organised with the CEPOG and the SFODF.

We are continuing our presentation beyond borders. Following our international issue last June, a Vietnamese practitioner is publishing a case study in our journal. He tells us a little about his training, orthodontics in his country and how he practises. Why not take a trip there one day?

The Julien Philippe Award is also in the spotlight with the publication of the winning thesis and posters of the three award-winning theses.

And let's talk about the future too!
The interfaculty week will take place at the end of April in Strasbourg and the SBR will supervise 2nd year residents.

It's decided and already well underway: we will meet in Barcelona on 2/3/4 October 2026 for our annual congress. 'Orthodontics and Surgery: the new deal' takes us across the Pyrenees to the south-west. Barcelona is easy to get to and the speakers lined up are renowned (French, Japanese, Vietnamese and, of course, Spanish). So publish your 'ortho-surgery' cases in the June 2026 issue of the journal! Tapas and sangria await us, but remember to book VERY VERY quickly!

Yours bioproprogressively,

Un cordial saludo (that's Catalan!)

Patrick
Guézénec
SBR President

SUMMARY

In memoriam
Carl Gugino

Linda and Carl Gugino.

By Linda Gugino

Carl F. Gugino.
Born on November 7, 1928, in Buffalo, New York, United States
Died: August 4, 2025, in Lakewood Ranch, FL, Florida, USA

A visionary, a man ahead of his time, passionate about excellence and beauty. His influence lives on in the many lives he touched and in the profession he helped transform.
Carl Frank Gugino, loving father and friend, pioneering orthodontist and resilient cancer survivor, passed away after a life marked by perseverance, innovation, and excellence. Born into a Sicilian-American family in Buffalo, New York, Carl was shaped by the industrious spirit of his parents and grandparents.

As a teenager, his dreams of a career in the performing arts or singing were tragically shattered when he contracted bulbar polio, which left him with partial vocal cord paralysis and lifelong physical hardship. Yet his determination never wavered. Inspired by his father, a dentist and teacher, Carl joined his father's dental practice.
He then majored in orthodontics and graduated from the University at Buffalo School of Dentistry in 1961. He has become a strong advocate for holistic dentistry, emphasizing individualized care and early diagnosis.

Carl's influence extended far beyond his practice. After opening his first practice in Buffalo, he partnered with Rocky Mountain Orthodontics to launch training programs in Europe.
This is how Carl came to France and taught in the early 70s, founding the Ricketts Society in 1973, which would become the Ricketts Bioprogressive Society a few years later. He met at this occasion Michel Delamaire, who became a close friend, translating his teaching courses till he passed away in 2010.

In 1969, Carl co-founded the Great Lakes Orthodontic Lab, now Great Lakes Dental Technologies, with his dental technician, Peter Breads, whom he trained in cephalometry and orthodontic modeling.


Édith Lejoyeux, Julien Philippe and Carl Gugino.

Together, they grew the company and provided training in Europe and Japan, advancing Great Lakes and Carl's Zerobase bioprogressive philosophy.

Carl was instrumental in introducing groundbreaking technologies to Great Lakes: the Bio-Star, SAM (in collaboration with Dr. Rudolph Slavicek), and the Japanese company Elastodontics. He has exclusive partnerships with the Spear and Dawson groups and won a prestigious Dawson Award in 2019.

A visionary of dental innovation, Carl was involved in the introduction of Conebeam technology in the United States in 2001 and has contributed to the development of tools such as TIM (an Italian visual treatment design program), surface EMG, and rhinomanometry for dentistry.

His legacy lives on in the products, practices, and professionals he inspired around the world. Dr. Gugino has been contributing to the dental community by sharing his innovative philosophies with other professionals for over six decades. He saw the ability to teach, motivate, and evolve the practice of orthodontics not only as a passion, but also as a privilege.
Considered one of the most forward-thinking professionals in the field of orthodontics and often described as far ahead of his time, Gugino's creativity, extensive research, and ongoing study led him to develop and write the Contemporary Zero-Based Orthodontic Philosophy.

From 1988 to 2016, he came to France, 4 weeks a year, to teach in the Bioprogressive Study Group, thus training more than 400 practitioners in his Zerobase design. At the same time, he discloses his vision of things in many countries, and today he allows us to communicate with many foreign practitioners, including our Japanese friends.

We owe the evocation of this full life to his wife, Linda, whom we thank very warmly here and whom we hope to see again in Barcelona, with some friends, during our congress, to which I have invited her.


Carl Gugino and Édith Lejoyeux.

By Pr Édith Lejoyeux

Carl, a Master and a Friend.

Shortly before we joined the Colmar Congress, we received the news of the death of our Master, Carl F. Gugino, the Society's Honorary President.

We celebrated the Society's 80th anniversary at the Issembourg congress in October 2008. I thought he would live forever; he was almost 97 years old. I first met him in 1972 during a course he was teaching in Geneva entitled 'An Orthodontic Philosophy'.

Julien Philippe had just become passionate about this new concept and had published his first book, Principles and a Technique.
He encouraged me to attend the course, unaware that this encounter would be pivotal and set the course for my entire career.

The man I met was in his forties, attractive and charismatic, and spoke quickly. Over the course of three days, thousands of slides scrolled by, unveiling what would become the programme of a lifetime as a practitioner and teacher. The following summer, I was invited to undertake a two-month internship in the three offices where he treated hundreds of patients. His unfailing energy, his 'clear-sighted' gaze and his extraordinary manual skill fascinated me.

I was far from understanding everything I was seeing.

However, I was unknowingly storing images that would become fixed in my memory. Throughout my clinical practice, these images have repeatedly emerged during sessions with my patients or students and have been suddenly clarified in the light of my own experience.

Every year, Carl returned for a thematic course that we followed with passion.

We became friends.
He trusted me as a disciple and had become the beacon that guided us. His energy and his pleasure in sharing and teaching were contagious. 'Pursue a Passion for Excellence and Progress' was his project; it became ours.

Throughout my career, I have pursued the quests he set us and followed the paths he opened for us. In doing so, I have discovered and developed a method which, as he announced on the first day, is an adventure in perpetual renewal. 'Bioprogressive therapy is not strictly an orthodontic technique, but more importantly, it encompasses a total orthodontic philosophy. Bioprogressive therapy accepts as its mission the treatment of the whole face, rather than the narrower objective of treating just the teeth or occlusion.'

With these words alone, he opened the door to an exciting future for the very young practitioner that I was, who was totally new to orthodontics but in love with knowledge and searching for ideals. He offered me the hope of an exciting career, a hope that has never been disappointed.

That's what I owe him.
I thank him from the bottom of my heart for this exceptional gift. Thank you!

By Dr Hiroshi Nezu, Gugino course instructor and BSC board member

I extend my deepest condolences on the passing of Dr Gugino, a loss which has left me profoundly sorrowful.
I was deeply shocked and saddened to hear the news.

He was an invaluable partner to my father, Mr Hiroshi Nezu, and a mentor to me in both orthodontics and life, as I had known him since childhood.

His wisdom, dedication and kindness have left an enduring legacy that continues to inspire all who had the privilege of knowing him.

Although we will deeply feel his absence, we are committed to carrying forward his vision and sharing his philosophy, which has had such a profound influence on the world of orthodontics.

Please accept our heartfelt condolences and sympathy for Linda and her family during this difficult time.

By Dr Jean-Luc Ouhioun

The news we had been dreading reached us on a beautiful day in August. The clear blue sky stood in stark contrast to our sadness. Behind his sometimes-gruff exterior lay a deeply compassionate man with a heart of gold and unwavering loyalty to his friends.

Carl Gugino, our spiritual father, our teacher, our friend, had quietly passed away.
With the ZeroBase concept, he had standardized orthodontic thinking in order to better individualize it and tirelessly place the patient at the center of his treatment.

Carl was a visionary. How many innovations did he teach us, often being the first to perceive their significance? He possessed that rare intuition, that almost instinctive gift of recognizing what was scientifically correct and immediately integrating it into his concept, the concept, always the concept, enriching it without ever straying from it.

I had the immense privilege of following his teaching when I started out in orthodontics, then accompanying him for nearly twenty years as an instructor in the CERTOB special groups, which he had created in Rennes with Michel Delamaire. Not a day went by, not a session, without him teaching us something new, without him reminding us of the importance of respecting the diagnostic and therapeutic flow.

Tireless, driven by boundless passion, he traveled the world to transmit, share, and convince.
Today, we, the members of the Ricketts Bioprogressive Society, have the honor and responsibility of continuing his teaching.

It is often said that when a man dies, a library burns. When we think of Carl, this image takes on its full meaning. But somewhere, in every smile restored to our patients by following his concepts, a little bit of that library lives on.

By Dr Hansi Seeholzer

Even after all these months, I still well up whenever I think of my dear friend, Carl Gugino.
I first met him in 1974 at a seminar in Vienna.

He was there with our dear friend Hito Suyehiro — a memory that will forever be etched in my heart.
Carl changed something deep inside me that day, flipping a switch in my mind.

Julien Philippe, Daniel Rollet, Carl Gugino and Michel Delamaire, four honorary presidents of the SBR.

Thanks to him, orthodontics came alive — it became meaningful, exciting and full of possibility. And with that first meeting, something equally precious began: a deep, honest and lifelong friendship.

Over the years, we shared many wonderful moments, and I always looked forward to not only learning from the great teacher, Carl Gugino, but also spending time with my warm and joyful friend, Carl — especially in the evenings when we shared stories and told international jokes. As the night grew late, the laughter always grew louder and brighter.

Thank you, dear Carl, for your wisdom, vision and generosity, and especially for your fatherly advice, which has guided me through life and will stay with me forever.

You will always have a special, honoured place in my heart.
I miss you deeply.
Your friend, Hansi

Patrick Guézénec and Carl Gugino.

By Dr Patrick Guézénec

After a long and fulfilling career, Carl has passed away.

The courses that we have been taking for over 30 years and the study groups in which I have had the opportunity to be an instructor have enabled me to get to know him as a person and as an orthodontist. He taught us to make diagnoses and treatment plans with rigour and method, encouraging us to consider our patients as more than just a set of teeth.

Many practitioners in France have undergone his training, and he introduced us to many renowned orthodontists, expanding our horizons beyond France and facilitating communication and exchange with our Japanese colleagues. We owe him a great deal in our daily practice — he was passionate about what he taught.

I was close enough to him to tell him one day that many practitioners had turned away from his teaching, finding that he always repeated the same thing. He replied, 'Yes, that's true, but how many really apply what I'm saying? So, I will continue...' We may be few in number, but we can appreciate his foresight. In the early '90s, Carl introduced a new concept in his lectures: elastodontics.

Aware of the potential of this new concept, our friend Loïc Gautier, who frequently attended Carl's lectures, created his own laboratory, 'France-Elastodontie', by buying the rights from Great Lakes. He asked me to pay tribute to our mentor, which I am happy to do.

And for all that, a huge thank you.

Coincidentally, one week after Carl's death, another of our founders passed away. Dr Guy Perrier d'Arc, who founded the Ricketts Society with Carl and a few others, joined him. These two men played a key role in the development of modern orthodontics.

Michel Delamaire bought one of their practices in Rennes and became the other's translator of words and thought.

A new chapter is beginning; let us learn from his teachings, which are still relevant today.

Carl Gugino with Hansi Seeholzer.

Daniel Rollet, Claude Chabre, Alain Bery, Michel Delamaire, Carl Gugino, Julien Philippe and Guy Perrier d'Arc, La Baule, France, 1998.

From left to right, top to bottom: Maki Terao, Hironobu Fumino, current president of the BSC, Kenji Nagata, Carl Gugino, and Hiroshi Nezu.

Dr Junya Nagata, board member BSC Japan

In memory of Dr Carl F Gugino
We mourn the passing of Dr Carl F Gugino with deep sadness.
He made outstanding contributions to the field of orthodontics in Japan and was an irreplaceable presence in our society, his lectures always full of insight and inspiration. They guided us towards new perspectives and a deeper understanding of our profession. The knowledge and spirit he shared with us will live on in all of us.
On a personal level, Dr Gugino was always kind and generous to me. I regret that, due to my limited English skills, I was not able to have deeper conversations with him. Nevertheless, his warm smile, genuine nature and unwavering passion for orthodontics transcended any language barrier and left a lasting impression on me.
Dr Gugino, thank you very much for everything you gave us. We will carry on your teachings and strive to honour your legacy.
May you rest in peace.

Dr Yoshiaki Nishikawa, BSC Japan

My deepest sympathy.
I served as an assistant for Dr. Gugino's courses from 2009 until his final visit to Japan. I was deeply impressed not only by his systematic treatment system and biomechanics, but also by his passion and determination for orthodontics.

What Dr. Gugino said, "Aim Higher," is something that I always strive to achieve. He was a person who combines strictness and kindness, so I believe he was a person who was truly respected and loved by everyone. For me, it was a great honor to be with him in his courses.

Takashi Nezu, Junya Nagata, Hiroshi Nezu, Carl Gugino and Kenji Nagata.

Carl and Linda Gugino with three of Dr Hiroshi Nezu's grandchildren (2013).

Dr Takafumi Ishiyama, BSC Japan

Dr Gugino, it is with the deepest condolences that we bid you a fond farewell.

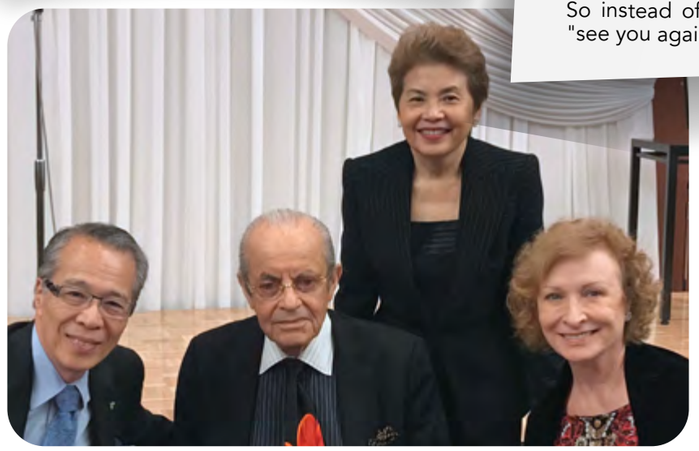
I first met you at the Gugino Course nearly 30 years ago. The lectures were the most fascinating I had ever experienced, and I am grateful to be able to continue working in orthodontics thanks to your teachings. Assisting as an instructor on the Gugino Course is an invaluable memory for me.

I am truly grateful for all your guidance and the memories we shared.
May you rest in peace.

Maki Terao, Gugino course instructor and BSC board member
Hironobu Fumino, Gugino course instructor and BSC president

Dedicated to Dr Carl F Gugino, our mentor.
BSC mourns the passing of its honorary president, Dr Gugino, with great sadness. Dr Gugino was renowned for his intellectual approach to orthodontics and dentistry, and was held in high regard throughout the dental community. He was a true visionary.

Thank you for all the time we spent together.
We will cherish what you have done for us forever.
You are unforgettable, near or far. Unforgettable, though near or far. Like a song of love that clings to me. The thought of you does things to me; never before has someone meant so much. May all your future wishes come true!
May all your dreams come true!
We promise to work hard until Dr Gugino's dreams come true.
So instead of saying "goodbye", we will say "see you again".



Hiroshi Nezu, Carl Gugino, Machiko Nezu and Linda Gugino.

Carl Gugino and some members of the BSC.

Dr Yasuteru Tanaka, BSC Japan

I was deeply saddened to learn of the passing of Dr Gugino.

He made outstanding contributions to the field of orthodontics, influencing clinicians around the world profoundly.

I was fortunate enough to receive his warm guidance and encouragement, from which I benefited greatly.

His passion and teachings will continue to inform my clinical practice.
I extend my heartfelt condolences and deepest respect.

Dr Kazunori Muraki, BSC Japan

Dear Dr Gugino,
Having had the opportunity to collaborate with you through the Gugino course and other projects was a truly fortunate experience for me. Thanks to your teachings, my perspective as an orthodontist has advanced significantly. I deeply admire how you have always considered the entire field of orthodontics and the next generation, dedicating yourself tirelessly to your work.
From that time onwards, I have been concerned about the decline in the quality of orthodontic treatment, and my goal has been to become a specialist of the highest calibre.
I have taken that advice to heart and have been following the path of orthodontics ever since.
I regret that my limited language skills prevented me from having more in-depth conversations with you.
Please rest in peace. I will never forget your teachings. Thank you from the bottom of my heart.

Dr Tomohiro Soboku, BSC Japan

News of Dr Gugino's passing was deeply felt by everyone whose life he touched. Dr Gugino was not just an orthodontist; he was a true inspiration who believed passionately in the potential of everyone.

He did not merely impart knowledge; he ignited a lifelong curiosity in all of us. We will honour Dr Gugino's memory by continuing to learn, challenge ourselves and approach orthodontics with the core values he embodied. We will never forget your valuable teachings, generosity and the great confidence you placed in us.

May you rest in peace.

Dr Ryo Nishimura, on behalf of the BSC Japan Case Presentation Committee

My deepest sympathies go out to you and your family, Dr Gugino.

In memory of Dr Gugino:

In our orthodontic work, we will always remember how you generously shared your cutting-edge knowledge and insights with us, delivering lectures with unwavering passion and enthusiasm. Our mission is to pass on your teachings to our juniors and do our best to provide orthodontic treatment to patients. Your Zerobase Bioprogressive Philosophy will live on!

Jean-Luc Ouhioun, Hiroshi Nezu and his wife, Carl Gugino et Makoto Kikuchi.

As we go to press, we have learned of the death of **Jean-Claude Geslin** on 27 November 2025. Jean-Claude was a partner of Michel Delamaire, owner of SBR, and often participated in Dr Gugino's courses in Rennes. We offer our sincere condolences to his family.

Mandibular opening and clockwise rotation in the treatment of low-angle class III malocclusion

Dr Dao Quang **Huy**

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Hai Duong (Vietnam)

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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

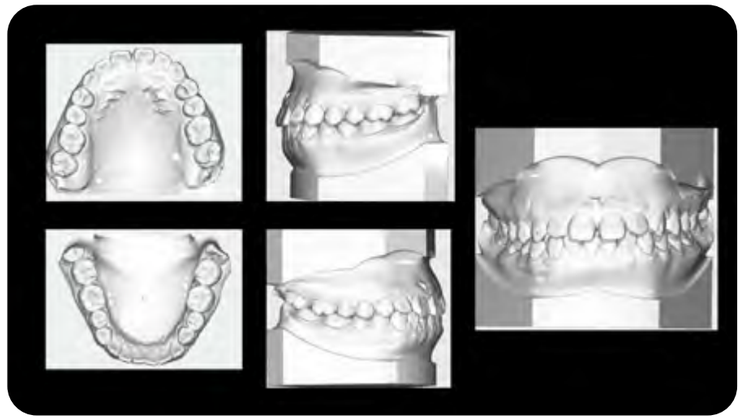


Fig. 5

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

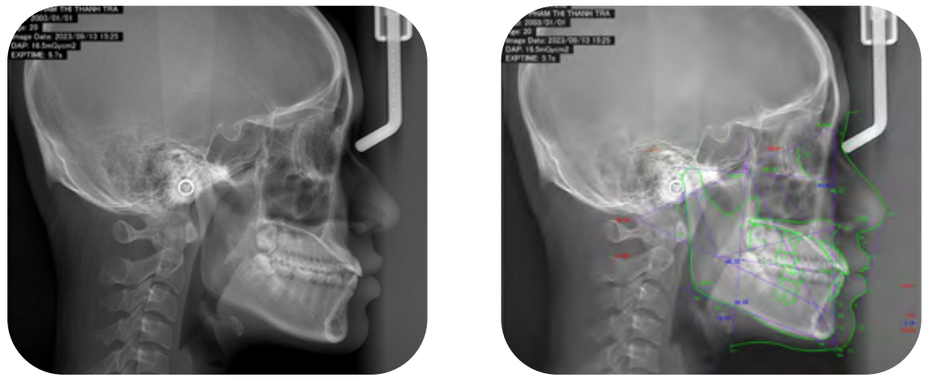


Fig. 8

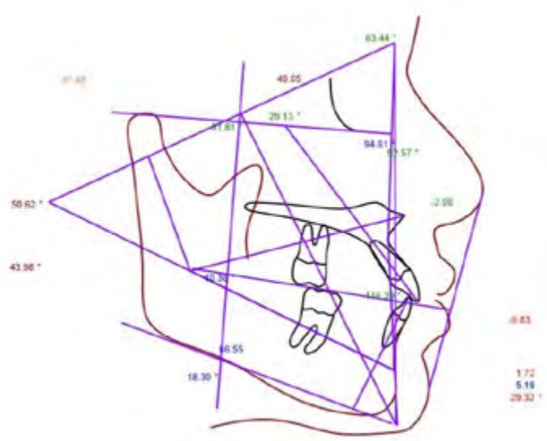


Fig. 9

- 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, 16 and 17

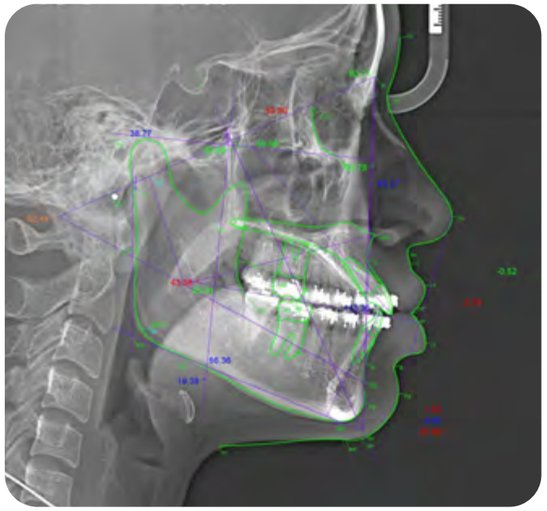


Fig. 18

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 and 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:



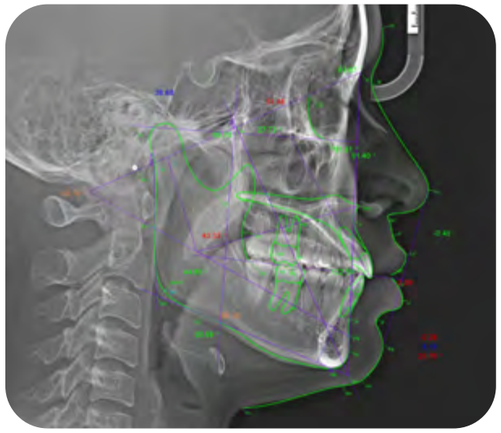
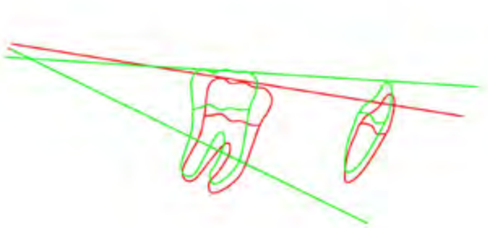
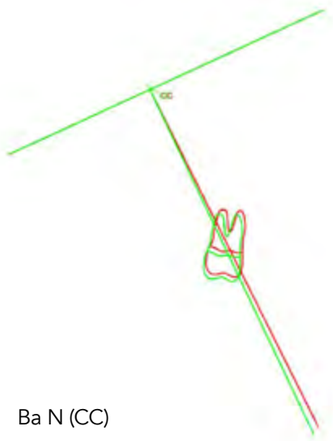



Fig. 49 to 52

SUPERIMPOSITION OF CEPHALOMETRIC X-RAYS
Before and after orthodontic treatment :



Xi-Pm



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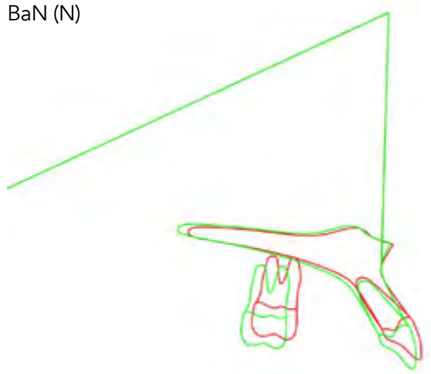
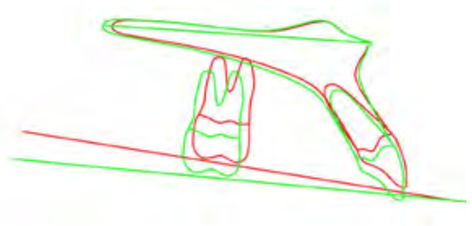


ANS – PNS



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 :

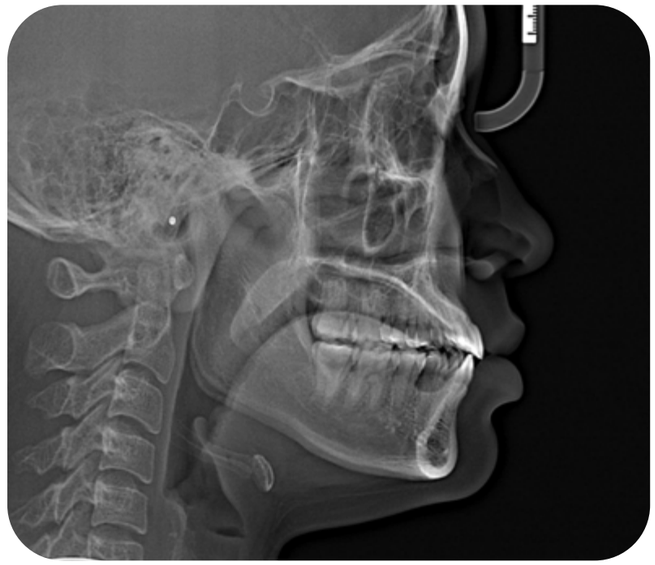


Fig. 63

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.

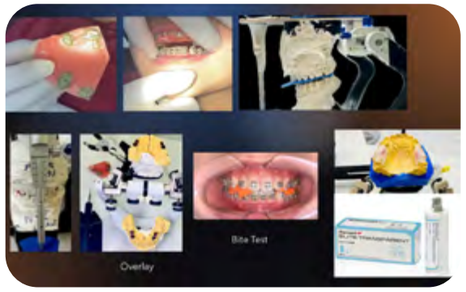
Fig. 64 and 65

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 mandible.
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.

Removing orthodontic brackets and integrity of the enamel surface

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GUEST SPEAKER SBR CONGRESS 2025 COLMAR

The removal of orthodontic brackets and the integrity of the enamel surface.
The aim of the removal protocol is to ensure that the composite resin is completely removed without causing any damage to the enamel. This systematic review analyses the impact of orthodontic bracket removal on the enamel surface.

INTRODUCTION

In this article, we will address a subject that concerns us all in our daily practice and which, in my humble opinion, should be considered of the utmost importance. Debonding, i.e. the removal of orthodontic brackets, is the moment that our patients are most looking forward to, as it marks the end of the active phase of treatment. It should leave the tooth surfaces in the same condition as before treatment began.

I will present the thesis of Dr Brandon Khorn from the University of Nice, which was supervised by Dr Romain Ceinos and Prof. Carole Charavet.

First, they conducted a systematic review of the literature to establish an overview of the current situation regarding the best debonding protocol. They then surveyed practitioners to find out about their removal habits, level of satisfaction and training, as well as their willingness to change protocols. Finally, they conducted a preliminary study to test the effectiveness of different protocols for preserving enamel. The aim is to establish a removal protocol in the near future. It should first be noted that debonding involves three steps: removing the brackets, removing the adhesive and polishing the enamel surface.

Although the development of dental materials, particularly resin-based composites and adhesive systems, has enabled more effective adhesion between enamel and resin, the downside is that the latter is more difficult to remove. Nevertheless, the principle of tissue preservation must remain our objective, and according to the literature, enamel loss should remain below 3%.

The risks are essentially iatrogenic and therefore operator-dependent.
For example, when removing the bracket with forceps, we may scratch the enamel or cause coronal fractures due to incorrect positioning of the forceps.
When removing the adhesive, there is a risk of damage from the bur itself, whether mechanical or thermal.

Although orthodontists have many techniques at their disposal, all of them cause varying degrees of damage to the enamel due to its lower hardness compared to the materials used, as well as etching with orthophosphoric acid. Among these materials, tungsten carbide (TCB) is a constituent of certain burs and remains the benchmark when they are used at low speed.

STEP 1: SYSTEMATIC REVIEW OF THE LITERATURE

Only one other literature review was found during this work. It concluded that steel or diamond burs and lasers should not be used, and that the TCB bur was faster and more effective.

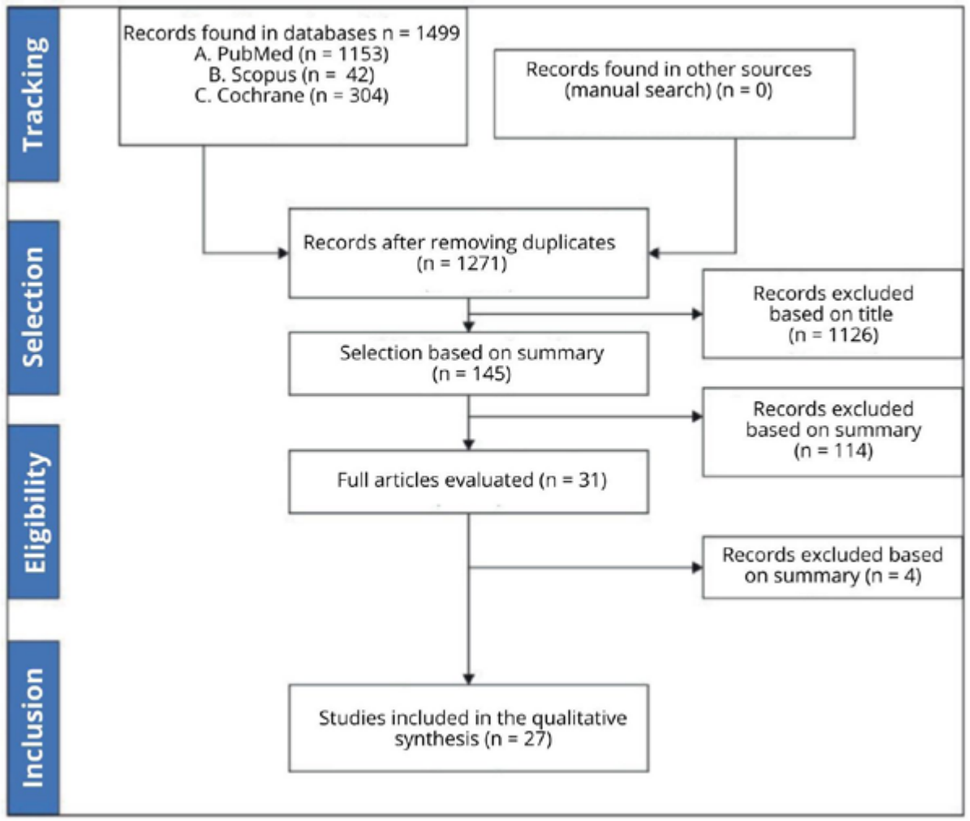
To meet the objectives of this study — to describe, compare and analyze the effects of different debonding techniques on enamel — the PICOS method was employed. The population consisted of patients with multi-band appliances and the intervention was debonding using a TCB bur. The comparison element was other debonding techniques.
The evaluation criteria focused not only on the condition of the enamel surface, but also on time, pain, cost and practicality. Biases were considered and, of 1,500 results, 27 studies were selected, including two randomized controlled trials and 25 in vitro studies. This article will therefore compare different techniques, such as ultrasound, manual scaling, sandblasting and Sof-Lex discs, as well as different burs, including fiberglass, composite, diamond and stainless steel.

According to the qualitative analysis, ultrasound produces a final roughness equivalent to that obtained with a bur and, when combined with forceps, results in cleaner surfaces. The quantitative analysis shows an equivalent enamel loss to that caused by a TCB bur, but less loss when combined with forceps.

In terms of time spent, which is rarely considered, the combination of forceps and ultrasound seems interesting.
Sandblasting leaves a rough surface, but without any histological alterations. It is superior to healthy enamel but inferior to the TCB bur, and there is less heating. However, it is more time-consuming.

For discs, both analyses agree that roughness is lower, but this comes at the expense of time.
The fiberglass bur has almost the same characteristics as the TCB bur at the end of deburring, in terms of both roughness and time spent. This distinguishes it from the composite bur, which is less time-consuming but more abrasive.

Finally, studies show that diamond and stainless-steel burs should be avoided as they cause scratches and rough surfaces. Manual scalers should also be avoided as they wear out quickly (steel is softer than resin).
This literature review has therefore shown that certain techniques produce results equivalent to, or even better than, those of the TCB bur. Ultrasound leaves a similar enamel surface and has the advantage of being ergonomic for the practitioner, as they do not need to change the insert when applying or removing the adhesive. However, the inserts must be changed regularly, and the technique is time-consuming and requires moderate force and a lot of water.



Instrumentation	Avantages	Inconvénients
Ultrasound	✓ Reducing the risk of dental damage ✓ Possibility of removing orthodontic brackets with the same ultrasonic tip	✗ Time-consuming ✗ Excessive wear on expensive US tips ✗ Application of moderate force ✗ Need for irrigation
Sandblasting	✓ Preserved pulp health (minimal temperature changes) ✓ Patient comfort	✗ Irrigation causing low contrast ✗ Time-consuming
Soft-Lex discs	✓ Improved aesthetics through progressive polishing ✓ High-quality polishing ✓ Increased safety through progressive resin removal ✓ Few scratches	✗ Complete withdrawal difficult and slow ✗ Presence of abrasive residues from the enamel disc ✗ Need for sequential use -> time-consuming
Fibreglass cutter	✓ Final surface roughness statistically similar to the roughness of the base surface ✓ Improved light reflection on enamel ✓ Self-sharpening fibreglass cutters	✗ Overall surface modification equal to that obtained with the carbide cutter and that obtained with the tungsten carbide cutter. ✗ Time-consuming
Diamond burr		✗ Persistent irreversible deep scratches
Stainless steel cutter		✗ Ineffective: difficult removal of adhesives ✗ Unacceptable surface
Manual scaler		✗ Rougher surface with distinct scratches ✗ Difficult manual control of withdrawal

Sandblasting, on the other hand, preserves pulp health and patient comfort as there are no vibrations. However, the cooling water can make it difficult to distinguish between resin and enamel.

Although discs produce a high-quality surface finish, they are very time-consuming to use and require strict adherence to the application sequence.

More recent, conservative burs designed for enamel surfaces have been developed in recent years, allowing for a reduction in roughness, albeit minor. Although light reflection and self-sharpening are advantages, studies show that these are offset by the time factor.

Diamond burs, steel burs and manual scalers should be avoided due to their proven iatrogenic potential. Please note that in this study, only the last two steps were considered. Furthermore, non-mechanized techniques such as lasers deserve consideration.

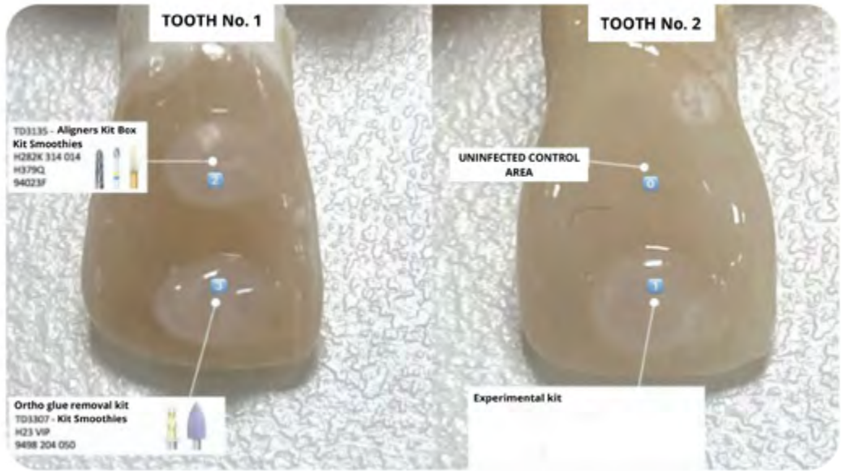
The same applies to other secondary criteria, such as time, cost, patient pain and comfort, and practitioner ergonomics, which are rarely considered.

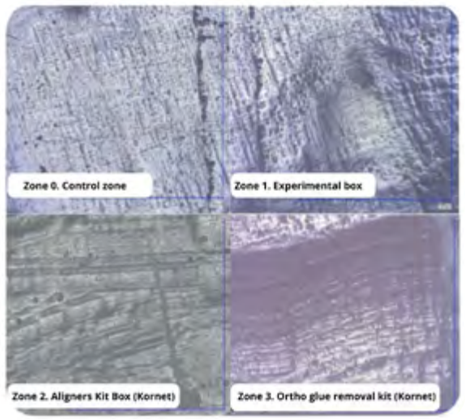
STEP 2: PRACTITIONER QUESTIONNAIRE

We will now move on to the second part of this study: the questionnaire sent to practitioners. The 60 responses obtained reveal a wide variety of protocols and degrees of personal satisfaction with practitioners' own techniques, as well as a desire for improvement in many cases.

STEP 3: IN VITRO STUDY

This prompted Brandon and the Nice team to conduct a preliminary in vitro study on natural teeth, assessing the impact of three different removal techniques: These were tested in zones 0 (the control zone), 1 (the confidential experi-





mental kit developed by Prof. Charavet and Dr. Ceinos) and 2 and 3 (two Komet kits). Resin blocks were placed to simulate post-application adhesive resin residue.

Quantitative 2D and 3D analyses and qualitative analyses using scanning electron microscopy showed that zone 1 had the most preserved surface in terms of roughness.

CONCLUSION

In light of the results of the literature review, the practitioner questionnaire and the in vitro study, it seemed only natural to continue the investigation in order to establish a codified protocol that is compatible with the reality of clinical practice in a private setting.

The aim is to combine efficiency with tissue preservation by developing a new generation of instruments. Professor Charavet's team is currently working on this new protocol, and we will keep you updated on their progress.

The psychosocial dimension of pain

Part 1

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The purpose of this article is to provide an overview of the most notable developments in research on the psychosocial dimensions of musculoskeletal pain and its implications for the treatment of the various 'forms of pain' observed in patients with temporomandibular joint pain disorders.

For an orthodontist, it is primarily a matter of recognising the different 'forms of pain', particularly at the start of or during orthodontic treatment. The management of pain symptoms is often within the scope of a practitioner who is not specialised in the field of pain. However, there are cases that need to be referred to specialist facilities.

INTRODUCTION

Temporomandibular pain affects between 5% and 7% of the population, placing it just behind lower back pain and neck pain. This population is referred to an orthodontist for ODF treatment. Sometimes, temporomandibular joint pain occurs during treatment.

This raises the issue of how to manage it.

Fundamental research is experiencing a resurgence of interest in chronic pain, with significant advances in understanding its aetiology, assessment and treatment. In parallel with fundamental studies, clinical and psychometric studies have highlighted the particular psychosocial dimension of 'painful' patients.

Thus, patients in psychological distress experience more intense pain and are more likely to report a deterioration in their quality of life. Depression and pain appear to share common neurobiological pathways, particularly in neurotransmission systems such as serotonin and noradrenaline (1).

These advances in knowledge have given rise to new terminology: 'nociplastic pain' instead of 'chronic pain' in cases where pain is altered by a dysfunction of nociception mechanisms.

WHAT IS THE 'PSYCHOSOCIAL DIMENSION' OF PAIN?

In the 1970s, the first studies on the subjective dimension of pain appeared, and Helkimo's indices assessed temporomandibular disorders

using two scales: an 'anamnestic index,' which assessed the symptoms perceived by the patient, and a 'clinical index' for the results of the clinical examination performed by the practitioner.

These indices, used for clinical assessment, were the subject of the first research in this field in dentistry. The results showed a wide disparity between clinical signs and symptoms.
In other words, the severity of symptoms is not always related to the severity of clinical signs observed by the practitioner.

'Psychological' patients?

Chronic pain patients are often labelled as 'psychiatric'. Early research therefore focused on the origin of 'psychogenic' pain, attempting to identify vulnerable profiles based on personality tests such as the MMPI (Minnesota Multiphasic Personality Inventory) or the SCL-90-R (Symptom Checklist). Different personality types and personality disorders were assessed in 'chronic pain' patients. This research did not identify any specific personality profiles (3).

Literature reviews by Rugh and Solberg (4) and Speculand and Goss (5) reached the same conclusions: no personality traits appear to be associated with temporomandibular disorders; however, high levels of anxiety and depression are often mentioned.

'Psychosocial distress'

The term 'social distress' covers all patients presenting with chronic stress, anxiety or depression. In a comprehensive review of the literature, Flor and Turk (6) examine the results of several studies on tension headaches, migraines, chronic low back pain, and temporomandibular disorders.

Numerous studies have found a relationship between pain intensity, its persistence, and various psychophysiological responses to stressful situations, particularly with regard to the action of glucocorticoids on the facilitation and memorisation of pain pathways.
More specifically, in the field of dentistry, a large prospective study, OPPERA (Orofacial Pain Prospective Evaluation and Risk Assessment), was conducted in 2013 (7).

Temporomandibular disorder may occur before or during orthodontic treatment. Pain is the main reason for consultation.

In this important study, approximately 3,000 subjects initially without temporomandibular disorder (TMD) underwent a battery of somatic and psychological tests and were then followed for a period of approximately three years. The authors conclude that the most predictive risk factor for the onset of TMD is psychosocial distress or disorder.

In summary: the concept of 'psychogenic pain' is not scientifically validated. At the same time, studies converge on the identification of psychosocial distress in chronic pain patients. Patients present with a form of chronic stress, anxiety or depression. These psychophysiological states are factors that promote and perpetuate pain symptoms.

DURATION AND INTENSITY ARE PROGNOSTIC INDICATORS

Under normal conditions, nociceptive stimuli decrease as healing progresses and the sensation of pain weakens until it disappears or becomes minimal.

In cases of extreme stress or trauma, for example, painful stimuli may be inhibited by the intensity of the physiological response, while states of generalised anxiety or anxiety 'focused' on the symptom increase pain perception.

Modulation of pain

This modulation of pain perception is both sensory and emotional. Excessive sensory stimulation inhibits pain transmission, while hypervigilance linked to anxiety increases pain perception.

Intense pain, even if temporary, can have lasting neurobiological and psychological consequences.

High levels of pain increase the likelihood of central sensitisation, leading to memorisation of the painful phenomenon (8).

A shift to chronicity

The transition from acute to chronic pain depends on disruptions in intrinsic pain control mechanisms as well as effective therapeutic measures, initiated as early as possible (9).

In a 2017 clinical study of patients with TMJ pain disorder, Forsell and colleagues (10) concluded that approximately 30% of patients suffering from severe pain with a range of other health problems and signs of psychosocial distress have an increased risk of poor prognosis, with a significant risk of progressing to chronic pain.

Psychosocial factors are the main contributors to the persistence of symptoms. Pain that lasts for more than three months is considered to be becoming chronic. After six months, it is considered to be chronic.

Chronic pain (> 3-6 months) causes changes in the central nervous system, affecting the excitability of nociceptive circuits. Chronic pain is often associated with major functional and emotional deficits that complicate rehabilitation (11).

In summary: the intensity and duration of musculoskeletal pain are factors that make treatment difficult and are indicators of emotional factors involved in the perception and persistence of the symptom.

NOCICEPTIVE PAIN AND PAIN DISORDER

Pain is often described as 'multifactorial'. While this term was rather vague a few decades ago, today it has two fundamental aspects: a sensory dimension, embodied by the nociceptive networks, and a psychosocial dimension, with its physiological corollary modulating or perpetuating the perception of pain.

Pain can be classified into two broad diagnostic categories depending on the significance of the associated psychosocial and behavioural factors: acute pain and pain disorder.

Fig. 2
Pain is a symptom: it is a subjective experience. It is communicated to the practitioner orally during the therapeutic consultation. It must be given special attention in order to identify the 'type of pain'.

Nociceptive pain

Acute pain, now referred to as 'nociceptive' pain, represents the common understanding of pain: it is an alarm signal indicating the presence of an injury or inflammation.

It is caused by excessive pure nociceptive stimulation. It is generally short-lived.

According to Fordyce (12), pure nociceptive pain can be recognised by the behaviours associated with it.
The diagnostic elements are:
- The clinical examination is positive.
- The pain is related to function.
- The suffering is not perceptible to those around the patient.
- There is no impairment of social, family or professional functioning.

The concept of 'pain disorder'

Pain disorder is defined by the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) (13) (Pain Disorder ref. page 461) as a syndrome in which pain is the main reason for consultation, associated with psychological factors of varying importance.

The intensity of the pain depends on the type of stimulus causing it, but also on the subjective perception of that pain. The DSM-IV specifies that psychological factors (stress, anxiety or depression) play a significant role in the onset, intensity and persistence of the symptom. The term 'acute pain disorder' is used for pain lasting between three and six months. Beyond six months, it is considered a 'chronic pain disorder'.

The transition from acute nociceptive pain to acute pain disorder and then to chronic pain disorder depends on the activity of central modulators (neuroplasticity) and the patient's response to the psychosocial context. In the case of acute pain disorder, patient management must include an assessment of the various dimensions of their symptoms (Fig. 3). The prognosis is favourable when stress factors are clearly identifiable or temporary. Taking psychosocial factors into account is essential for recovery and prevents the condition from becoming a chronic pain disorder.
Patients with chronic pain disorders have a lasting alteration in the regulation of painful somesthesia and, at the same time, mood disorders, emotional distress or depression.

These patients should be referred to facilities specialising in pain management.

In summary: nociceptive pain, traditionally referred to as 'acute pain', differs from pain disorders in which psychophysiological factors play a role in triggering, intensifying and perpetuating the symptom. These factors are predominant in cases of chronic pain disorders. Patients should be referred to specialist consultations.

IDENTIFICATION OF PAINFUL BEHAVIOR

"Painful Behavior"

In behavioural science, behaviour encompasses all physiological, psychological and motor activities in relation to an environmental or psychosocial situation.

The variability in the expression of pain symptoms has led researchers to attempt to identify specific pain profiles based on the severity of the symptom and the patient's psychosocial profile.

Turk and Rudy (14) propose a tool, the MPI (Multidimensional Pain Inventory), for both psychosocial and behavioural assessment.

These authors identify three homogeneous, statistically valid and reliable subgroups:

– An 'adaptive' group (32%), presenting a low level of pain and disability. This group consists of active individuals with little psychological distress and good control over their environment despite the presence of TMD symptoms.

– An 'interpersonal distress' group (22%). This group is similar to the previous one, but differs in terms of the quality of social support.

These individuals, who are under stress, cannot find a satisfactory solution to their painful problem within their family, social or medical environment.

– A 'dysfunctional' group (46%) with a high level of pain and functional impairment. This group is characterised by depression and emotional distress.

Patients are passive and have difficulty controlling their socio-professional or emotional environment.

QUESTIONNAIRE ON TEMPOROMANDIBULAR DISORDERS

Surname: .....First name: .....Date:.....

PAIN QUESTIONNAIRE

Complete the following questionnaire if you have jaw pain;
Otherwise, proceed to the following steps:

	YES	NO
Is the pain caused by jaw movements, such as chewing or yawning, for example?		
Does the pain occur in the morning upon waking, during the day, or in the evening, unrelated to jaw movement or chewing?		
Is the pain always present in the background?		
Is the pain caused by contact with the skin or the gums?		
Does the pain come on suddenly?		
Do you have any other painful areas in your body?		
The intensity of your pain (on a scale of 1 to 10)		
Less than 5/10		
Higher than 5/10		
How long has your pain lasted (How long have you had this pain?)		
Less than 3 months		
Between 3 and 6 months		
More than 6 months		
GENERAL HEALTH		
Does the way your teeth meet feel comfortable to you?		
Is your sleep disturbed?: difficulty falling asleep, waking up during the night...		
Do you suffer from digestive problems?: Difficulty digesting; constipation; allergies?		
Do you have any other frequent pains: back pain, neck pain, headaches?		
STRESS FACTORS		
Have you experienced a significant change in your life recently?		
Are you experiencing a difficult or stressful situation?		
If so, are you receiving assistance?		
Are you an anxious person?		

Fig. 3
The 'Pain' questionnaire for TTMs. It helps identify different types of pain, intensity and duration. Note the questions on general health and stress to identify the psychosocial dimension and type of pain.

You can download the file by scanning this QR Code.

A new 'pain typology'

In a 2015 study (15), Finnish researchers analysed a group of patients suffering from TMJ pain (n = 399) using a multidimensional questionnaire. They identified subtypes of patients with TMD based on pain-related disability and psychosocial variables such as stress, anxiety, depression, general health, etc.

Three 'subtypes' of patients were revealed by this study.

TYPE I: the group without disability (61%), with low pain levels and appearing to function well psychosocially, with better pain control and fewer functional limitations of the jaw.

TYPE II: a group with low disability (27%). Patients with low disability experience higher levels of pain, physical symptoms such as sleep disorders and psychological distress from stress and anxiety, with significant functional limitations of the jaw.

TYPE III: a group with high disability (12%) with the highest levels of symptoms of depression and somatisation, sleep disturbances, anxiety and catastrophic thinking, and other pain problems.

In this first part, we explored the psychosocial mechanisms of musculoskeletal pain in the TMJ and identified three distinct patient profiles.
In the next issue, we will detail the therapeutic strategies appropriate for each type, as well as the key role of the practitioner in their management.

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Bioprogressive & principles charter

The bioprogressive method is not merely an orthodontic technique; **it is a comprehensive orthodontic therapeutic approach, with its own philosophy.**

> Primacy is given to diagnosis and to the determination of treatment objectives. These account for approximately 75% of treatment success.

> The clinical examination considers the individual as a whole: morphological, physiological, esthetic, postural, and psychological balance. The concept of the "degree of difficulty" arises from this assessment and guides the practitioner's clinical choices.

> The treatment plan is based on the search for the optimum for each patient, from both functional and esthetic perspectives, rather than on achieving values that conform to predefined "norms."

> Objectives for the dentition, skeletal architecture, and soft tissues through growth predictions and the mounting of study casts on an articulator, according to the degree of difficulty.

> The integration of growth and maturation phenomena — skeletal, dental, and psychophysiological — **makes it possible to treat certain anomalies at an early stage and to unlock growth potential.**

> Patient awareness, motivation, and functional education are part of the first stage of all treatments.

> The design of mechanical systems depends on individualized objectives, the degree of difficulty presented by the dentition, and the functional envelope. It must ensure facial axis stability and three-dimensional control of tooth movements.

> The forces used are light and continuous; **parasitic movements and frictional forces are minimized within a specific segmentation of the arches.**

> The base arch, the keystone of mechanical systems, is not used dogmatically. Its adjustments are reasoned and adapted according to the specific role it plays within the treatment sequence.

> In accordance with these principles, we commit to "improving our patients' quality of life and strengthening their self-esteem by restoring function and enhancing facial appearance; seeking optimal occlusal, esthetic, and functional outcomes for each patient; providing patient care in accordance with ethical principles; and subordinating all our actions to the principles of integrity, innovation, and the pursuit of excellence."

Interview
Dr Dao Quang Huy

By Dr Patrick Guézénec

Hello, Dr Huy. You are based in Hai Phong, near Hanoi, and I found out about you through the website "Bioprogressive Rickets," where you publish numerous cases. Could you introduce yourself and tell us about your background?

I studied for six years at the University of Medicine and Pharmacy to obtain my dental degree. During our studies, orthodontics is only covered at a basic, theoretical level. After graduating, I worked for five years in a dental clinic (which is mandatory in our country before opening your own practice), and during that time, I attended many long-term and intensive orthodontic courses taught by international professors. Later, I opened my own clinic to focus primarily on orthodontics.

Do you have a specialist title in Vietnam? Are you allowed to practice orthodontics without a specialist title?

In Vietnam, practicing orthodontics does not require a formal specialist degree as long as we work under the supervision of an orthodontic expert. I obtained a professional certificate in orthodontics, issued by the University of Medicine and Pharmacy.

With my experience and training, I am considered an expert and, as such, can supervise young, newly qualified practitioners.

How many orthodontists are there in Vietnam?

Currently, a few thousand dentists practice orthodontics. Most start out as general practitioners and then undergo training to specialize. A small number have formal specialist degrees from domestic or foreign universities. This number is gradually increasing, driven by growing demand from patients.

Can you take postgraduate courses?

After graduating, I took many courses taught by international experts, and now, I organize seminars and training workshops myself to share my knowledge. The students who attend these seminars are already graduates, with a small number in their final year, aiming to specialize in orthodontics.

Are your patients referred by a general practitioner? Can they come on their own initiative?

Yes, they can come directly, without going through a dentist. But most cases are referred by their dentist, especially complex cases requiring specialized orthodontic treatment. This allows for good cooperation between the dentist and orthodontist, ensuring efficiency and good timing in treatment.

At what age do you see your youngest patients?

I usually start patients around 6/7 years old, and I use functional education a lot when it is indicated.

What about surgical cases?

It is rare in Vietnam for patients to come in for surgical problems, so I often try to offer compromise solutions, even for cases with a surgical indication, in order to reduce risks. I have a wide range of non-surgical solutions and only recommend surgery when it is absolutely necessary.

What is the approximate cost of orthodontic treatment in Vietnam?

The cost of treatment varies, of course, depending on the method used. A complete metal brace costs between 1,000 USD and 1,500 USD. The use of ceramic braces or aligners costs between 2,000 USD and 3,000 USD. Compared to other countries, this is much less, but the cost of living is lower and the quality is always improving.

You are very active on Facebook and seem to be very involved in training young practitioners, presenting very interesting cases with a high degree of difficulty, always treated with bioprogressive therapy. How did you learn this treatment method, and do your students follow the same approach?

I learned this technique based on the philosophy of Dr. Ricketts and this way of approaching cases from Professor Sato. I like to apply this method, especially to growing patients, and I get excellent results. I continued this training in postgraduate courses from Vietnamese professors and international teachers. When I was a dental student, I only had access to basic orthodontic knowledge. In Vietnam, bioprogressive therapy is considered as an advanced level and is taught at the postgraduate level.

Thank you very much, Dr. Huy. The case you present following this interview reflects the quality of your results, and I am sure we will have the opportunity to publish some others. It has already been published in the PDF version of our journal, in English, but printing constraints prevented us from publishing it in last June's international issue. In any case, we are delighted to feature it in this issue and look forward to hearing from you at our next conference.

It is always enriching to see colleagues working with the same approach.

Thank you again!

23rd MEETING OF THE SBR INTERNATIONAL CONGRESS

BARCELONA

HILTON AVENIDA DIAGONAL

OCTOBER 2, 3 and 4 2026

Coordinated by the Southwest region

SURGICAL-ORTHODONTIC SYMBIOSIS:
THE NEW DEAL

Under the scientific chairmanship of Dr. Maxime Rotenberg

PRE MEETING SESSION

FRIDAY, OCTOBER 2ND, 2026

10.00 / 11.30:
Tribute to Carl GUGINO with Linda Gugino, drs. Nezu & BSC , H Seeholzer, S. Sambataro, SBR members who want to share (P. Guézénec, Jean-Luc Ouhioun etc) and some others

Afternoon: inaugural conference

I am a teenager and my face is going to change
Dr. Olivier Revol Head of the Child Neuropsychiatry Department at the Neurological Hospital of the Lyon University Hospital

Non surgical procedures in class III
Dr. Jean-Louis Raymond Qualified specialist in orthodontics

Dr. Arturo Vela Hernandez Dentist, orthodontist

Treatment of a surgical class III with overlay and clockwise mandibular rotation
Dr. Dao Quang Huy Qualified specialist in orthodontics

Orthodontist in the mind of the dentist
Dr. Pierre Cardot Qualified specialist in orthodontics

Particularity of surgical preparation in lingual technique
Dr. Magali Mujagic Qualified specialist in orthodontics

Particularity of surgical preparation with aligners
Dr. Romain de Papé Qualified specialist in orthodontics

SATURDAY, OCTOBER 3RD, 2026

Afternoon:

Title to be confirmed
Dr. Naoyuki Yoshino
Qualified specialist in orthodontics

Title to be confirmed
Dr. Hironobu Fumino President of the BSC

Maxillary expansion with TAD

Prof. Damien Brézulier
Qualified specialist in orthodontics

Dr. Gauthier Dot Qualified specialist in orthodontics

Non surgical treatment of class II
Dr. Luis Carriere Qualified specialist in orthodontics

SUNDAY, OCTOBER 4TH, 2026

Morning:

orthognathic surgery and sleep apnea
Dr. Jérôme Bessard Maxillofacial surgeon

Early orthognathic surgery: how far can we go ?
Pr. Frédéric Lauwers Maxillofacial surgeon

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Breastfeeding

Growing up at the breast: when feeding shapes the face

Dr Claire **Torrens**
Doctor of Dental Surgery
Practice limited to orthodontics

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In the depths of motherhood, a newborn instinctively clings to its mother's breast.
Its first action is to suckle. Behind this seemingly simple moment lies a fascinating mechanism: a perfectly coordinated ballet of the tongue, lips, jaw and oropharyngeal muscles. Repeated thousands of times during the first few months, this gesture gradually shapes the child's face.

Now, let's imagine the scene differently: the baby drinks from a bottle or sucks its thumb or a dummy. The muscles do not work in the same way, the pressures change, and breathing may be altered.

Little by little, the growth of the face takes a different direction, sometimes less harmonious, which can lead to malocclusions or functional disorders.
These differences, invisible at first, have lasting consequences. Today, dental malocclusions and craniofacial growth disorders affect a large part of the population. According to the World Health Organisation (WHO), 60 to 75% of children and adolescents have an occlusion anomaly.

Beyond aesthetics, these imbalances can disrupt breathing, chewing, swallowing, phonation and even sleep, thus impacting quality of life.

Facial growth is not solely dictated by genetics. It is also shaped by the environment.

Early functions – breathing, sucking, swallowing, chewing – are real drivers of development. Among these, breastfeeding plays a major role, providing infants with natural muscle stimulation.

The WHO recommends exclusive breastfeeding for the first six months, followed by continued breastfeeding alongside complementary foods until two years of age and beyond. Its benefits for overall health are well known: protection against infections, reduced risk of obesity and type 2 diabetes, and strengthening of the mother-child bond.

However, its role in facial growth remains largely unrecognised.
When suckling at the breast, the tongue moves forward and presses against the palate. This gentle, repeated pressure stimulates the natural expansion of the palate and balanced growth of the dental arches. The jaw moves rhythmically, the muscles work harmoniously, and breathing remains nasal.

Bottle feeding or sucking on a pacifier engages the muscles differently. In the long term, this can lead to imbalances and orofacial dysfunctions that promote malocclusions such as anterior open bite, narrow palate, or certain Class II malocclusions.
In France, breastfeeding remains a challenge. According to the 2021 national perinatal survey, 56.3% of women breastfeed exclusively in the maternity ward, but this figure drops to 33% at 2 months.

This rapid decline, which is much more pronounced than in other European countries, reflects a lack of support and information, particularly on the orthodontic benefits.
In this context, orthodontists play a key role.

By working with paediatricians, IBCLC consultants, physiotherapists and ENT specialists, they can detect dysfunctions at a very early stage, inform families and support growth towards harmonious development.

Understanding the link between breastfeeding and craniofacial growth means rethinking orthodontics as a preventive discipline, starting in the first weeks of life. This article explores the physiology of sucking, the impact of breastfeeding on facial development and its clinical implications for comprehensive and early care for children.

PHYSIOLOGY OF BREASTFEEDING

Breastfeeding is the first major orofacial function that newborns must master.

Much more than just a means of feeding, it is the foundation on which breathing, swallowing and, later, chewing and phonation are built.

As an early training ground for the orofacial system, it engages all the muscular and skeletal structures in a harmonious manner.

Unlike bottle feeding, which is often more passive, breastfeeding requires fine neuromuscular coordination.
Each movement is precise, rhythmic and perfectly synchronised, allowing the baby to breathe, swallow and suckle simultaneously without choking.

The neuromuscular mechanisms of breastfeeding

To obtain milk, the infant must perform three simultaneous actions:
- seal their mouth around the nipple with a wide, stable latch;
- create intraoral suction, a genuine suction that allows milk to flow;
- coordinate breathing and swallowing in order to maintain a safe and effective rhythm throughout the feed.

This process, which appears instinctive, is in fact the result of complex coordination involving several key structures:
- **The tongue:** the real driving force behind sucking, it is positioned in a trough shape under the nipple and performs a wave-like movement back and forth. These movements promote natural tongue peristalsis and exert gentle

lateral pressure on the jaws, stimulating transverse expansion of the palate and balanced growth of the arches.

- **The mandible:** it moves rhythmically in a back-and-forth motion. This physiological functional pattern promotes the forward development of the mandible, essential for bone balance and the prevention of certain skeletal misalignments.
- **The lips:** tightly closed, they stabilise suction and help to create intraoral vacuum. They work in synergy with the tongue and mandible to maintain an effective and comfortable grip.
- **The soft palate and pharyngeal muscles:** these adjust finely to the breathing rhythm, allowing continuous nasal breathing during feeding and promoting the proper development of the upper airways.
- **Breathing:** always nasal, it remains regular and fluid. This early nasal breathing plays a key role in the harmonious growth of the facial structure and the prevention of respiratory disorders.

Breastfeeding is therefore much more than a simple feeding reflex: it is a complete functional exercise that mobilises every muscle and structure in the face.

By exerting gentle, repeated physiological pressure, it guides the growth of the face and paves the way for harmonious orofacial development. This first exercise, repeated several times a day for months, is one of the pillars of natural orthodontic prevention.

Differences between breastfeeding and bottle feeding

Bottle feeding is fundamentally different in terms of mechanics and function:

CRANIOFACIAL GROWTH: FUNCTIONAL DYNAMICS AND CLINICAL IMPLICATIONS

Craniofacial growth results from a close interaction between genetic potential and early functional stimuli such as breathing, sucking, swallowing and chewing. While genetics define the foundations and potential, it is the orofacial functions that guide and modulate growth in three dimensions.
An optimal functional pattern promotes balanced and harmonious growth, while impaired function can cause morphological and functional imbalances very early in life.

Skull base: orientation and foundations

The skull base, which is cartilaginous in origin, grows thanks to synchondroses comparable to the growth plates of long bones.
It plays a fundamental role, as it defines the orientation and anteroposterior projec
tion of the maxillae.
Disrupted growth at this level can lead to severe skeletal dysmorphosis, such as Class II in cases of mandibular growth insufficiency or Class III in cases of mandibular hyperdevelopment or maxillary deficiency.

SETTING	SUCTION AT THE BREAST	SUCTION ON A BABY BOTTLE
LANGUAGE MOVEMENT	Undulating, anteroposterior, physiological	Vertical piston, rigid tongue
MANDIBULAR POSITION	Light propulsion, activates growth	Passive opening, little stimulation
BREATHING	Nasal, coordinated with sucking	Can be oral
MUSCULAR EFFORT	Important and thorough	Low, asymmetrical
PALATE STIMULATION	Physiological transverse expansion	More vertical pressure
COORDINATION OF SUCTION, SWALLOWING AND BREATHING	Highly developed, rhythmic	Less thin

Skull vault: internal motor

The skull vault develops through membranous ossification under the direct influence of brain growth.
The brain acts as a true internal motor, exerting an expansive force that causes the sutures to open and then gradually close.

This development indirectly influences facial morphology by modulating the position and orientation of the base of the skull.

The cranial vault is less directly involved in dental malocclusions, but it plays a key role in certain asymmetries or craniostenoses, such as plagiocephaly or scaphocephaly, when the sutures close prematurely.

Facial skeleton: expression of functions

The maxilla and mandible are the areas where the influence of orofacial functions is most clearly evident. Their growth is directly modulated by breathing, sucking, swallowing and chewing

The maxilla

The development of the maxilla depends on the nasal septum, which acts as a vertical and anterior pillar, and on functional forces.
Normal nasal breathing exerts gentle, regular pressure, promoting harmonious enlargement of the palate and nasal cavities.
Conversely, chronic mouth breathing leads to a narrow, deep palate, reduced nasal cavities and an elongated face.

Breastfeeding stimulates the maxilla through the movements of the tongue against the palate, promoting transverse and sagittal expansion and the establishment of an optimal functional pattern for swallowing and chewing.

The mandible

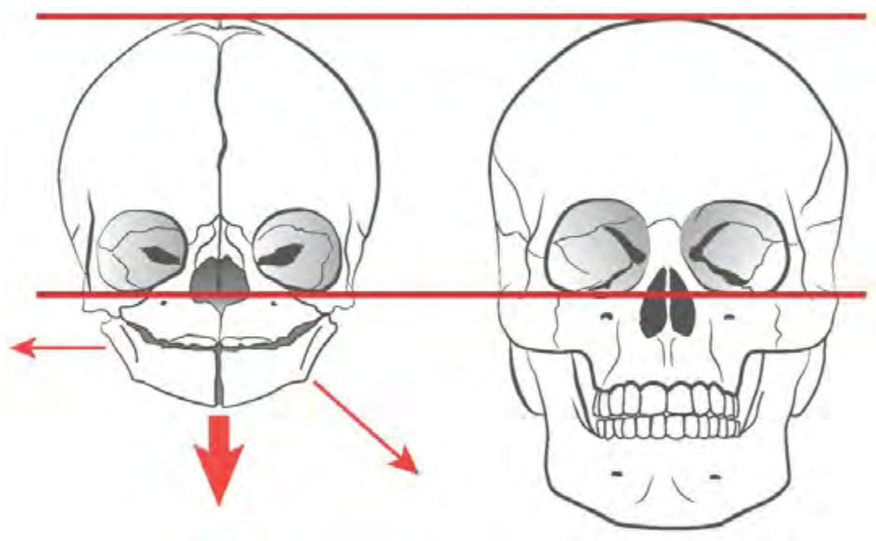
Mandibular growth occurs through the condylar cartilage and continuous bone remodelling.
It is stimulated by chewing, swallowing and occlusal contacts.
During breastfeeding, mandibular propulsion movements promote anterior growth and limit the risk of skeletal Class II malocclusion.

On the other hand, a lack of stimulation, prolonged liquid feeding, absence of chewing or tongue thrusting can slow down the development of the mandible and lead to asymmetries or growth delays.

PROLONGED BREASTFEEDING AND CRANIOFACIAL GROWTH: THE FIRST FUNCTIONAL APPARATUS

From birth, infants begin to shape their faces through a simple and vital action: suckling.
Each feed is much more than a nutritional act.
It is a natural therapeutic exercise, repeated several times a day, which stimulates the facial structure, guides bone growth and strengthens the orofacial area.

Among the many factors that influence growth, physiological suckling at the breast, especially



when it continues beyond the first few months, stands out as one of the most powerful and underestimated. It acts as an integrated functional device, invisible but incredibly effective, capable of preventing the onset of many malocclusions.

Breastfeeding: perfect mechanics for growth

When a baby suckles, it mobilises its neuromuscular system with remarkable precision.
This process involves complex coordination that stimulates all the orofacial structures:

- The tongue
It positions itself against the palate and performs regular undulating movements. This gentle but constant pressure promotes the natural transverse expansion of the maxilla, creating the basis for a wide, well-formed palate.

- The mandible
The repeated propulsive and retropulsive movements during suckling stimulate the anterior growth of the mandible, contributing to a balanced profile and reducing the risk of skeletal Class II malocclusion.

- Nasal breathing
During feeding, breathing remains exclusively nasal.
This early coordination between sucking, swallowing and breathing promotes the development of the upper airways and reduces the risk of chronic mouth breathing.

- Overall muscle balance
All the orofacial muscles work in synergy, creating a physiological functional pattern that supports harmonious growth and stable occlusion.
Successful breastfeeding reproduces the principles of an ideal functional apparatus: stimulating the ight muscles, guiding the bones in the right direction, and promoting nasal breathing.

Why duration changes everything

The impact of breastfeeding on craniofacial growth depends directly on its duration.
A few weeks are enough to initiate the functional pattern, but only prolonged repetition stabilises and anchors these mechanisms.

- Short breastfeeding (< 3 months)
Incomplete stimulation.
Risk of early interruption, often replaced by a dummy or thumb sucking.

- Intermediate breastfeeding (3 to 6 months)
Partial effects on the shape of the palate and muscle balance. Functional patterns still unstable.

- Extended breastfeeding (≥ 6 months, ideally up to 24 months and beyond).
Optimal and lasting stimulation. Neuromuscular stabilisation: the tongue, lips and mandible definitively adopt physiological functions. Significant reduction in the use of harmful sucking habits.

Children who are exclusively breastfed for at least six months have a 33 to 50% reduced risk of developing certain malocclusions, compared to those who are not breastfed or are breastfed for a short period. Each additional month of breastfeeding represents a month of active prevention, reducing the need for heavy interceptive treatment later on.

Many studies show a protective association between prolonged breastfeeding (≥ 6 months) and certain traits such as posterior crossbite and overjet. However, not all orthodontic traits appear to be affected: for example, the data are less robust or contradictory for certain traits such as deep bite or tooth alignment.

Some studies show that the duration of breastfeeding alone does not predict all changes up to the mixed or permanent dentition: the effects may diminish or be modified by other factors (non-nutritive sucking habits, breathing, etc.). Longitudinal follow-up is essential.

Breast milk after 1 year: an evolving resource

Many families believe that breast milk loses its value after 1 year. This is not true. In reality, its composition evolves to adapt to the needs of a growing child.

According to the report Composition of breast milk after 1 year (2020): The concentration of antibodies and fats increases, strengthening the immune system. It remains an essential source of vitamins, calcium and polyunsaturated fatty acids, which are essential for bone growth and brain development.

It continues to protect against infections, while supporting dietary diversification.
Thus, prolonged breastfeeding does more than just nourish: it creates an optimal biological and functional environment for the child's overall growth.

THE ROLE OF THE ORTHODONTIST IN EARLY PREVENTION: FROM A CURATIVE ROLE TO A PREVENTIVE MISSION

For decades, orthodontics has focused on correcting established malocclusions, often in adolescence, sometimes even in adulthood. But research on craniofacial growth, the role of orofacial functions and the impact of breastfeeding has revolutionised our understanding of facial development. We now know that the first years of life are crucial.

They represent a period when growth is malleable, when every breath, every suck, every swallow exerts forces that shape the face.
At this stage, a simple dysfunction can alter the growth trajectory... and what we correct later is often only the consequence of an undetected imbalance.

This observation may redefine our role: orthodontists should no longer be mere repairers, but rather guides to growth, screening and prevention specialists, capable of acting before dysmorphosis becomes permanent.

Early screening: detecting invisible signs

Facial growth in the early years is like a play in rehearsal: each movement falls into place, still reversible, before the first performance that will set the structures in stone.
It is during this phase that the orthodontist can intervene to observe, detect and redirect.

Early warning signs to look for:
- persistent mouth breathing;
- difficulties with breastfeeding, maternal pain indicating ineffective latching;

- persistent infantile swallowing or early swallowing disorders;
- facial or mandibular asymmetries detectable from the first few months;
- established and prolonged non-nutritive sucking habits (dummy, thumb).

The idea is to avoid anterior open bite and marked Class II malocclusion at the age of 6. Detecting these signs early allows the function to be corrected before the bone adapts, thereby limiting the severity of future malocclusions.

Supporting parents: prevention starts at home

Parental education is a major factor in preventing malocclusions. When well informed, parents become the primary contributors to their child's harmonious development.

The orthodontist can:

- explain the importance of prolonged breastfeeding, not only for general health, but also for orofacial growth;
- establish a dialogue about the sensible use of dummies and weaning, warning against the risks of prolonged sucking.

A simple piece of parental advice can prevent the development of chronic mouth breathing or prolonged non-nutritive sucking, two major factors in maxillary endognathia.

A multidisciplinary approach: the key to success

Early intervention cannot be isolated. It relies on a synergy of skills, with each professional contributing to the overall effort:

- IBCLC lactation consultants: to optimise sucking and latching;
- paediatricians: for overall growth monitoring and detection of associated disorders;
- speech therapists and physiotherapists: to re-educate the tongue, lips and breathing;
- ENT specialists: to diagnose and treat restrictive frenula or obstructive disorders.

Interceptive orthodontics: guiding growth instead of correcting it later

When an anomaly is identified early, interceptive orthodontics becomes a powerful tool. Rather than waiting for a malocclusion to become established, we can act on its trajectory. Intervening early means working with growth, rather than against it.

Orthodontists and public health: an expanded role

Beyond our practices, we have a role to play in public health, particularly in reducing the prevalence of malocclusions.

POSSIBLE ACTIONS:

- Participate in awareness campaigns on breastfeeding, nasal breathing and early chewing.
- Create local networks to facilitate screening and referral of young children.
- see our patients very early in their care journey and provide parents with advice on best practices.

The earlier we intervene, the more we reduce the frequency of severe Class II malocclusions, endognathia and complex open bites, and the more we improve the
quality of life of children... and their families.

CONCLUSION: CHANGING OUR PARADIGM

Every suckle, every nasal breath, every chew is a microstimulation. Taken together, they shape the child's face.

By observing these signals, the orthodontist becomes an architect of growth, not just a technician of correction. Prolonged breastfeeding is the first natural functional appliance. It acts from birth, without metal, without elastics, without appointments...

It is up to us, orthodontists, to recognise this, promote it and fully integrate it into our clinical thinking.

The future of orthodontics lies in this approach: preventing rather than repairing, guiding rather than constraining, and accompanying growth rather than undergoing it.

POSSIBLE ROLES OF THE ORTHODONTIST ACCORDING TO THE AGE OF THE CHILD

(SEE TABLE OPPOSITE)

AGE OF THE CHILD	MAIN OBJECTIVES	SIGNS TO LOOK FOR	ACTIONS OF THE ORTHODONTIST	KEY PARTNERS
0–6 months	Supporting the establishment of sucking and nasal breathing	• Breastfeeding difficulties (poor latching, maternal pain) • Restrictive tongue tie • Early mouth breathing	Functional assessment of sucking • Advice to parents on breastfeeding positions • Detection of restrictive frenula and referral for treatment	IBCLC consultant, pediatrician, ENT specialist
6–24 months	Maintaining physiological functions and preventing harmful habits	• Non-nutritive sucking • Persistent infantile swallowing • Snoring or mouth breathing • Asymmetrical facial growth	• Parent education: gradual weaning from the dummy • Early screening for functional disorders • Referral to a physiotherapist or speech therapist if necessary	Paediatrician, speech therapist, physiotherapist, IBCLC consultant
2–4 years	Screening for early signs of malocclusion	• Narrow or high-arched palate • Class II or emerging Class III • Anterior open bite • Speech disorder	• Initial orthodontic assessment • Advice on breathing and swallowing • Suggest simple functional exercises	Paediatrician, speech therapist
4-6 years	Intervening early to guide growth	• Severe endognathia • Marked maxillomandibular discrepancy • Established mouth breathing	• Fitting of interceptive appliances • Close monitoring of progress	Speech therapist, physiotherapist, ENT specialist
6 years and +	Screening for early signs of malocclusion	• Complex malocclusion • Persistent atypical swallowing • Articulation disorders or impaired phonation	• Conventional or combined orthodontic treatments • Complementary functional rehabilitation	Speech therapist, physiotherapist, ENT specialist, paediatrician

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Endocrine disruptors

GUEST SPEAKER SBR CONGRESS 2025 COLMAR

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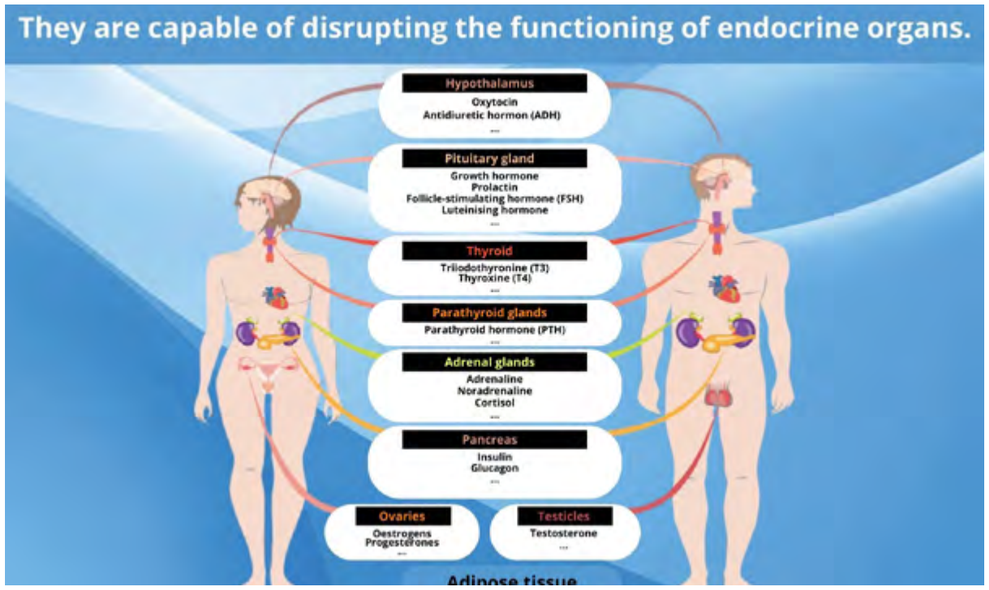
Heraclitus (450 BC) said: "The state of human health reflects the state of the earth's health. ' The increase in environmental pollution and its effects on ecosystems is worrying, as it contradicts the 2005 constitutional law, which states in its first article: 'Everyone has the right to live in a balanced environment that is conducive to their health. "

In this context, the study of endocrine disruptors (EDs) is a major challenge for the medical profession, public authorities and researchers. The sources of exposure (the concept of the exposome) are numerous and difficult to control, while the medical consequences are still poorly understood for certain molecules and complex to study.

The dangers of EDCs concern us all, as these products are found everywhere: in the air, water, soil, in all our living spaces and in all environments. EDCs can be found in our food, water and all the everyday products around us, such as clothing. It is therefore essential that the medical profession as a whole discovers and embraces the scientific reality of this new issue.

Discovering these often hidden pollutants and understanding how they work enables us to take action, i.e. to protect ourselves as best we can.



DEFINITION

An endocrine disruptor (ED) is defined as "an exogenous agent that interferes with the production, release, transport, metabolism, binding, action or elimination of natural ligands responsible for maintaining homeostasis and regulating the development of the organism " (EPA [US Environmental Protection Agency]).

ESDs can therefore interfere with the hormonal secretions of all our endocrine glands (hypothalamus, pituitary gland, thyroid, gonads, etc.), not to mention fat cells (adipocytes), which are true endocrine glands and are often overlooked. Other names for EDCs include xenoestrogens, hormone mimics, and endocrine disruptors.

SPECIFIC TOXICOLOGICAL RULES

'It's not the dose that makes the poison,' meaning that a low dose can have a greater impact than a higher dose. This is not intuitive.
We know that for human health, the high-risk period is foetal life and early childhood. Among the specificities to remember: A significant window of sensitivity during embryogenesis and the first three years: the importance of the impact during the perinatal period.

Ps in parents can cause infertility in children. EPs during pregnancy can cause abnormalities such as miscarriages, gestational diabetes and gestational hypertension.

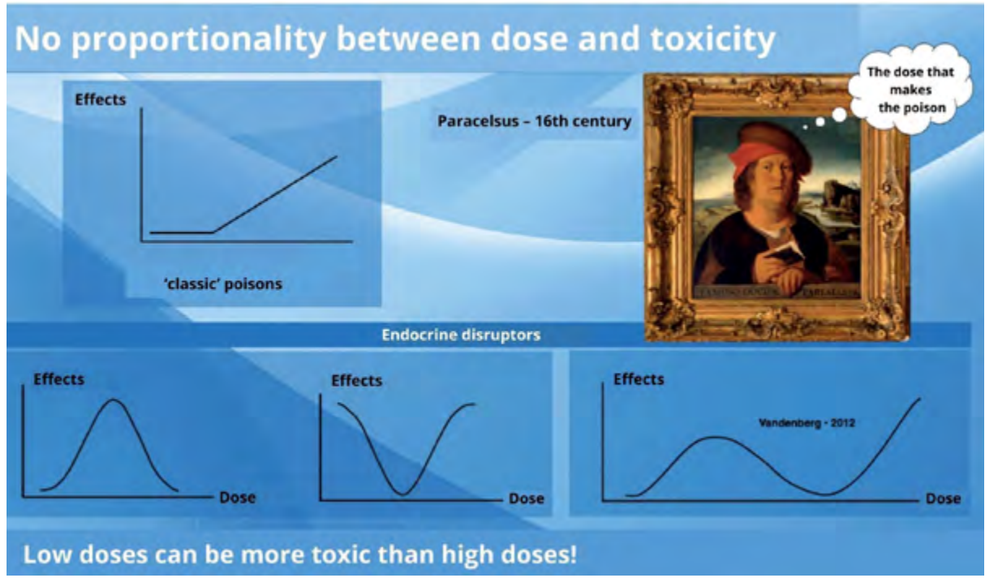
Changes in intrauterine development, low birth weight or premature births. Furthermore, these children may develop various diseases as adults and pass them on to their offspring through epigenetic modifications, which are changes in gene expression without changes to the genome.

The subject of epigenetics alone would require an entire article.
EPs are mostly lipophilic, oestrogenic and, more rarely, antiandrogenic.
EPs do not have a specific target organ, meaning they can affect all organs. In addition, they generate oxidative stress.

MODE OF ACTION

EPs can interfere at all levels of the hypothalamic-pituitary axis, right down to the corresponding endocrine glands.
The first and most studied axis is the hypothalamic-pituitary-gonadal axis. There are four main modes of action of EDCs: – Their action on the synthesis, transport, metabolism and excretion of hormones (disruption of endocrine gland metabolism).

– Their action on the synthesis of hormone receptors or on their function, but also on hormone function. EDCs can alter the message normally delivered to the cell, which will then trigger a response different from that normally induced by the hormone.



– Their direct or indirect action on DNA, producing epigenetic modifications, i.e. modifications in gene expression.

All these actions are achieved through mimetic effects (the EP resembles the hormone), or through inhibition or competition with the natural hormone, or through alteration of cellular hormone receptors, or even through epigenetic modifications. But in reality, the effects of these substances are much more complex. On closer inspection, EDCs are essentially "cell communication disruptors".

Communication between our organs and cells is necessary for the dynamic maintenance of homeostasis and enables cell development, histogenesis, organogenesis, coordination of the body's activities – seasonal phenomena, reproductive cycles (menstrual cycle), sleep/wake cycle, metabolism – and the body's defence mechanisms.

The endocrine, nervous and immune systems are involved in communication in order to dynamically maintain homeostasis in our bodies. However, EDCs can interact with all three of these systems. This gives us an idea of the complexity of their impact. It is clear that EDCs affect the endocrine system, as well as the nervous and immune systems.

WHAT ARE THEY?

More than 90% of endocrine disruptors are 'xenobiotics' (foreign substances) that have been widely manufactured and released into the environment since the mid-19th century due to the development of synthetic organic chemistry, i.e. carbon chemistry, and therefore petroleum.

Since then, we have been able to "play with LEGO" with all the atoms in Mendeleev's periodic table! As a result, millions of molecules that did not previously exist on the planet now surround us.

There are many ubiquitous chemical families:

– Dioxins.
– PCBs (polychlorinated biphenyls).
– PAHs (polycyclic aromatic hydrocarbons), which come from the combustion of organic matter, among other sources.
– Bisphenols: a large family of more than fifteen bisphenols, including BPA, BPF, BPB, BPS and BPC. BPF and BPS, authorised replacements for BPA (food containers, baby bottles, etc.) since its withdrawal, are more toxic and carcinogenic than BPA.
– Phthalates: plastic softeners, for example
– Perfluorinated compounds (PFAS), known as 'forever chemicals' and currently the subject of much debate, with non-stick, waterproof and heat-resistant properties. They can also act as surfactants (surface-active agents).
– Polybrominated compounds: fire retardants, flame retardants, etc. – Pesticides, including many different types: herbicides, insecticides, fungicides, rodenticides (against rodents), molluscicides, etc. They are designed to be persistent in the environment.
– Parabens: antifungals and antimicrobials (E214 to E219).
– Certain metals: mercury, lead, cadmium, arsenic, etc. Cadmium is currently in the news because we find it in large quantities in children's breakfast cereals and other common foods.
– Certain halogens such as bromine.
– Phytoestrogens such as genistein in soy: a 'soy-only' diet to avoid meat is not a good solution for Westerners like us.
– Hormonal and other drugs which, once in the environment (through faeces, urine, sweat), are to be considered as xenobiotic pollutants in their own right.

WHERE ARE THEY FOUND?

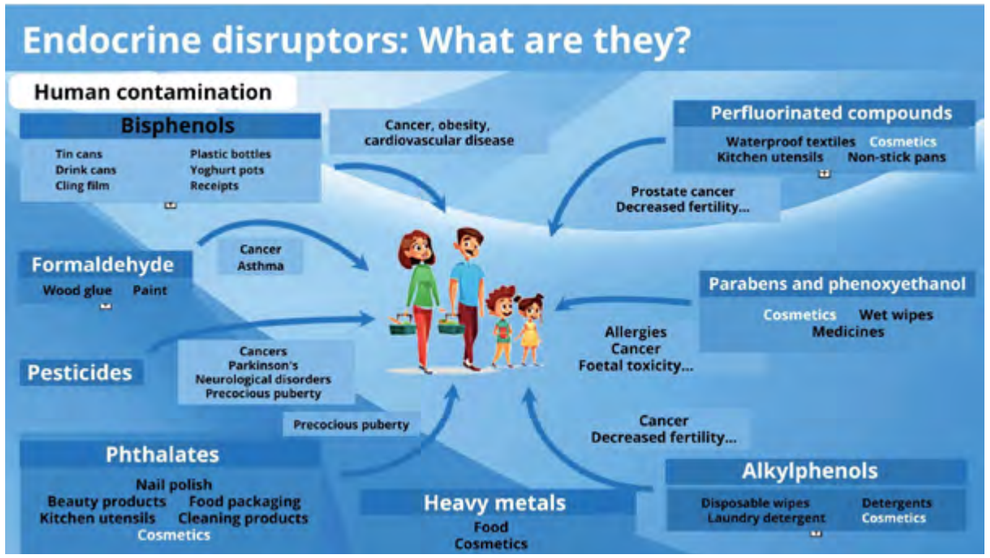
Everywhere! They are ubiquitous in the environment and also in our bodies! They cross all biological barriers: skin, lungs, blood-brain, placenta, etc.

WHAT ARE THE HEALTH IMPACTS?

Les perturbateurs endocriniens ont de nom-Endocrine disruptors have many different effects on:

– Reproduction: they cause subfertility in men and women, genital malformations in boys (hypospadias, micropenis and cryptorchidism), early puberty, endometriosis, PCOS (polycystic ovary syndrome), etc.
– Metabolism: they cause overweight, obesity, type 2 diabetes, lack of satiety and the differentiation of stem cells into adipocytes. They are also responsible for metabolic syndrome.
– Thyroid: they cause hypo- and hyperthyroxinemia and promote the onset of autism spectrum disorders, decreased IQ, etc.
– Nervous system: they cause behavioural disorders (attention deficit disorder, hyperactivity, autism spectrum disorders), psychiatric disorders such as the infamous diethylstilbestrol (DES), but also Parkinson's disease (an occupational disease among farmers), etc.
– The immune system.
– Many of them are carcinogenic.

This list is far from exhaustive!



CONCLUSION

The impact of EDCs on perinatal health is of fundamental importance. Perinatal health, in the broadest sense, is defined as the period between the moment a couple decides to have a baby and when the child reaches the age of 4 or 5. It is mainly during embryogenesis and the early years of a child's life that the impact of EDCs can be catastrophic.

This period must be prepared for, hence the importance of pre-conception consultations to give future mothers the best possible advice on how to avoid contact with EDCs as much as possible. We must never forget that EDCs during perinatality will have consequences for the whole of a child's future life and possibly for their offspring...

Environmental responsibility in the office

GUEST SPEAKER SBR CONGRESS 2025 COLMAR

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Dr Élise **Pastwa**
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France

Dr Justin **Oosthoek**
Specialist in orthodontics and consultant at a design office specialising in low-carbon transition

We organised this conference as a duo, in the form of a quiz, which allowed us to address various topics. Here are the questions asked to participants and the answers highlighted in bold.

At a time of climate change, general and specialist dental surgeons must incorporate measures to reduce the environmental impact of their practices into their daily work.

However, little data exists on the challenges of ecological transition in dentistry.

As I was setting up my orthodontic practice, it was important to me to have a working environment with the lowest possible carbon footprint. The invitation to this conference immediately made sense, and it was only natural that I joined forces with Justin Oosthoek.

A specialist in orthodontics and a consultant in low-carbon transition design, he brought a scientific approach to the table, while I tried to come up with practical applications that could be implemented in dental practices, while ensuring quality care and a healthy working environment for staff and patients.

> Installing solar panels on the roof of your office can reduce your carbon footprint by: 5 to 10%, 10 to 15%, or **have virtually no impact.** (Fig. 1)

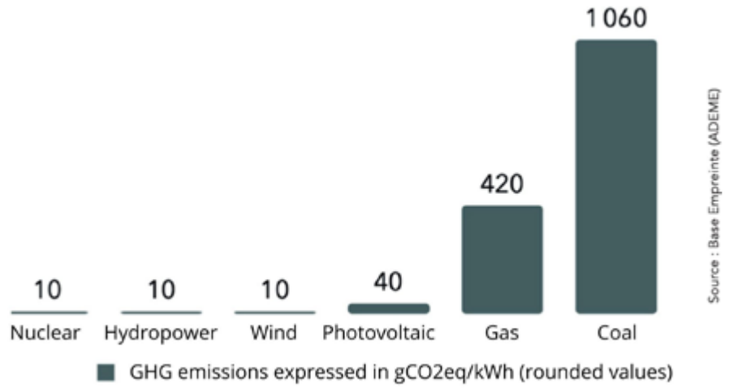

Fig. 1

When renovating my office, I wanted to know the cost of installing photovoltaic panels on the roof of the building.

A company gave me a quote of €70,000 for a surface area of 230 m². I would have produced more than I needed and could have sold the surplus, which is interesting from an economic point of view, but not so much from a carbon footprint perspective. It therefore seemed sensible to me to invest this considerable sum in another solution that would have a real impact on the carbon footprint.

Of course, this needs to be weighed up according to the geographical area, and I will take the example of the West Indies, where dependence on fossil fuels is still high and where, to a lesser extent, there is more sunshine.

> Replacing a gas boiler with a heat pump can reduce heating emissions by 10%, 30%, 60% or **90%**? (Fig. 2)

First, let's define what a heat pump is: it is a heating system that captures the calories present in the air, water or ground and converts them into energy using very little electricity.

That said, it is important to bear in mind that we have two courses of action: firstly, changing our heating system, i.e. switching from fossil fuels to non-fossil fuels, and in this respect, heat pumps are an excellent alternative.

For my part, this is the only solution proposed by the architect, as it was a raw space. But in the case of changing the heating system in an existing practice, it is very difficult to estimate the cost of a heat pump, which varies from £7,000 to £22,000 without the various government subsidies, and its profitability.

However, it seems safe to say that a heat pump remains very cost-effective over a 10- to 15-year period, given the increase in gas prices and, at the same time, the fall in the cost of heat pumps, which are becoming more widespread.

Changing your heating system is a good idea, but it can be complicated, especially in an existing practice. The second lever to be activated is therefore energy efficiency, i.e. trying to reduce heating consumption. For my part, the building I purchased was insulated from the outside and equipped with double glazing. We optimised our future consumption by installing thermostats in each room in order to lower the temperature in certain rooms or at certain times such as at night or on weekends, and maintain a comfortable temperature of around 19°C.

Keep in mind that one degree less means a 7% energy saving.

> Does buying an energy-efficient television reduce its carbon footprint by **less than 10%**, 25%, 50% or 75%? (Fig. 3)

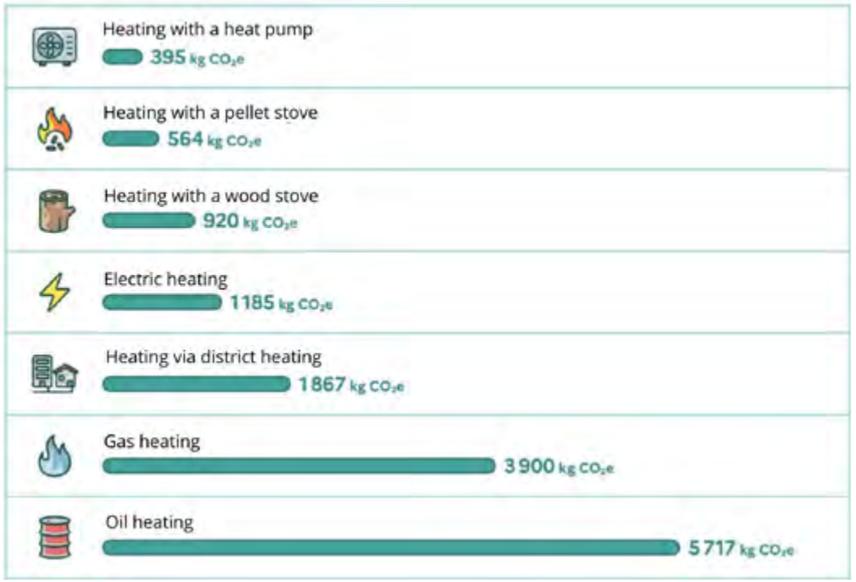

Fig. 2

When I thought about reducing my practice's carbon footprint, I asked myself this simple question, which should be our guiding principle: do I really need it?

And, more broadly, do my staff and patients need it? That's how I decided not to install a television in the waiting room, even though I was initially attracted to the idea of using it to broadcast prevention messages or recommendations.

In fact, I realised that most patients stay on their phones in the waiting room, the television is often broken or left off, and waiting times are short. I also chose not to install a patient reception kiosk, which I do not consider essential and which I have often seen being underused or not used at all in practices that have one.

To take this approach further, it is not so much the transport or use of a device that weighs on its carbon footprint, but rather its manufacture. I try not only to purchase equipment that is certainly expensive initially, but of high quality and therefore theoretically more durable (think, for example, of light-curing lamps), but also, as far as possible, to choose second-hand or reconditioned equipment.

So, I bought my desks, chairs and break room table on a second-hand website.

Unfortunately, the process is much more complex when it comes to specific dental equipment, particularly because of the lack of after-sales service, and it is in this sense that we must encourage and work with sales representatives to set up a genuine reconditioned and second-hand sector with the same characteristics (quality control, after-sales service, etc.) as the traditional new purchase sector.

Let's continue with dental equipment and the following question:

> Does the use of disposable examination kits generate fewer emissions than the use of sterilisable kits, roughly the same or **more emissions**? (Fig. 4)

Here again, let's ask ourselves the question: do we really need them?

And here I would like to introduce the 3 Rs rule, a concept that emerged in the 1970s: reduce first, reuse before, recycle after.

So, let's try:

- to limit ourselves to what we really need: for example, avoid goodies that are not used by patients in certain toothbrush kits (such as mirrors and hourglasses);
- Favour reusable items by changing our habits, which may require education and time: for

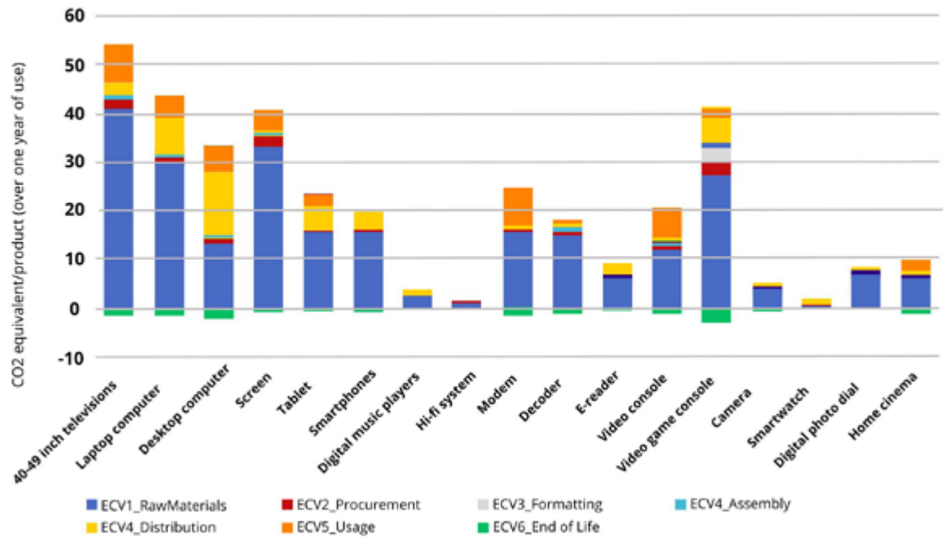

Fig. 3

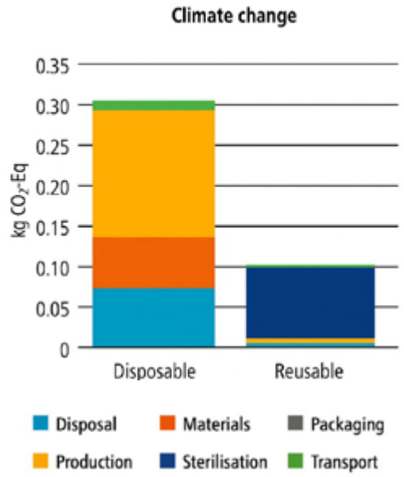

Fig. 4

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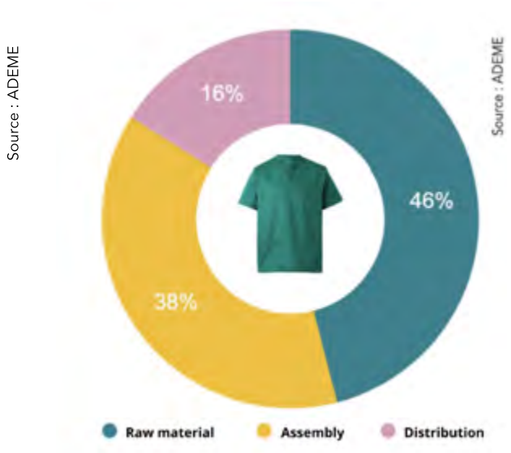


Source : ADEME

Fig. 5

example, replacing our disposable trays with stainless steel ones or our gowns and caps with fabric equivalents.

> Buying products made in France is good for the climate: is this always true, **generally true**, generally false or always false? (Fig. 5)

We need to be careful when using the term 'made in France': it does not refer to where the raw material is manufactured, but to its nature.

It is therefore advisable to opt for toothbrush kits made from recycled fibres or linen, or to choose committed local players such as laboratories or suppliers, encouraging them to calculate the carbon footprint of their products, as proposed by a computer manufacturer that indicates the carbon impact of each of its computer mouse models.

Given that it is the nature of the raw material and the manufacture of the product that have the greatest impact on the carbon footprint, it would again be appropriate for players in the dental sector to set up a genuine reconditioning chain, ensuring that the equipment is checked and after-sales service is provided.

Another key area that can be applied to a dental practice is transport.

> Over its entire life cycle, an electric car in France emits ten times less than a combustion engine car, **three times less**, or the same or more? (Fig. 6)

It should be noted that in France, electricity is generated from nuclear or hydroelectric sources, so it has a lower carbon footprint than in Germany, for example.

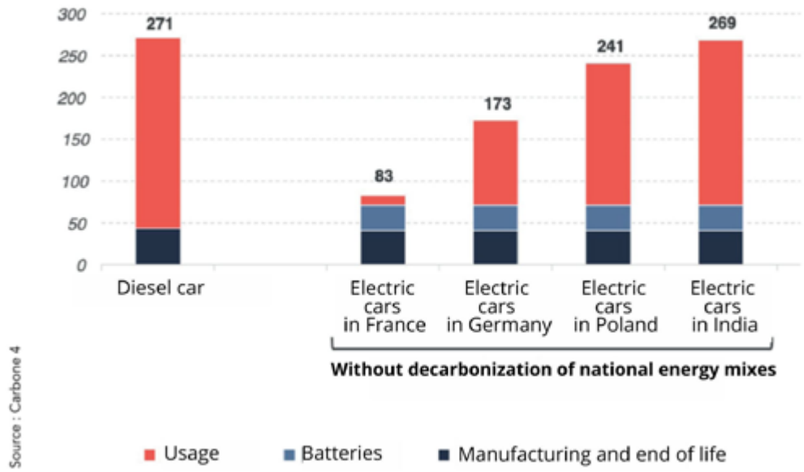
The best solution is still... not to use a car at all. But not all practitioners have the luxury of cycling or walking to work, nor do their staff or patients.

Installing charging stations may encourage your team to opt for electric cars, which remain an excellent alternative when you consider that transport is the practice's biggest source of emissions.

For my part, I have installed bicycle racks and encouraged patients to use sustainable modes of transport by clearly indicating bus routes on the website or when making appointments, I have also reorganised the practice to group appointments for siblings together, conduct treatment plan presentations via video conference, and allow the secretary to work from home on certain mornings.

And we will conclude with this final question on a topic that is often discussed in the media and which, once again, affects us on a daily basis:

> Does storing 1,000 emails with attachments generate as many emissions as driving **2.5 km**, 25 km, 250 km or 2,500 km in a combustion engine car? (Fig. 7)



Source : Carbone 4

Fig. 6

Most firms have implemented paperless systems, but it turns out that this does not have a significant carbon impact.

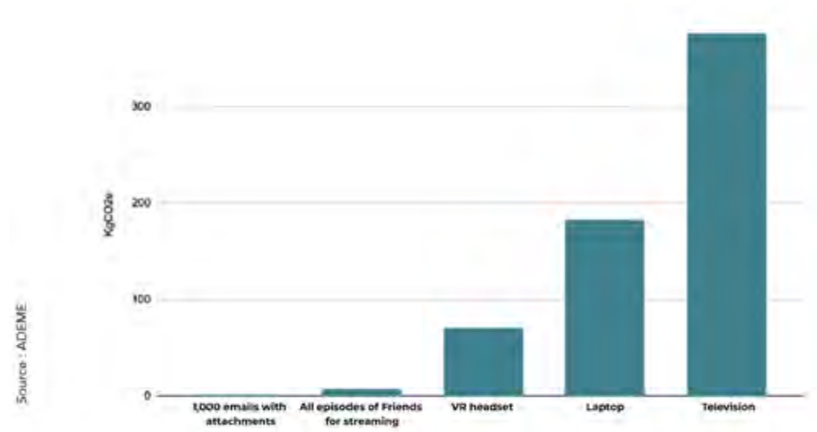
However, the use of digital technology poses problems in other areas, such as the depletion of rare metal resources.

Currently, the most polluted site in the world is not Chernobyl, but a landfill site for electronic components, which are still very rarely recycled.

It is therefore not only from a carbon perspective that we need to think about making law firms more environmentally responsible.

We must also consider other sources of pollution, such as water pollution, by choosing environmentally friendly and non-polluting cleaning products, for example, or by trying to limit products that are hazardous to human health, carcinogenic or endocrine disruptors.

This could be the subject of another conference...



Source : ADEME

Fig. 7

Toxicity of resin-based orthodontic materials:

current data and clinical recommendations

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GUEST SPEAKER SBR CONGRESS 2025 COLMAR

Dr Claire-Adeline **Dantagnan**
Specialist in orthodontics

INTRODUCTION

Modern orthodontics relies heavily on the use of resin-based devices, whether bonding materials (brackets, retainers, clips) or removable devices (aligners, splints, Hawley plates) (1). These polymer-based materials are ubiquitous in our clinical practice, but their potential toxicity is raising increasing concerns (1).

Indeed, their polymerisation reaction is never completely finished, leaving free monomers that may be released into the oral environment (2) (3). The chemical, thermal and mechanical degradation of these materials placed in the mouth could also lead to the release of potentially harmful organic compounds (Fig. 1) (1).

Among these, bisphenol A (BPA) and its derivatives occupy a central place due to their endocrine-disrupting activity (Fig. 2) (2) (3).

BPA is omnipresent in our environment (2) (4-6). It can be absorbed in various ways (gastrointestinal, sublingual, cutaneous, respiratory and even materno-foetal). Once absorbed, BPA is distributed to various tissues and organs, then metabolised and eliminated, mainly through urine.

It can also accumulate in certain tissues such as adipose tissue (2) (5). The sublingual route is of particular concern because it leads to greater systemic exposure than the digestive route (2).

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This is of particular interest to us in orthodontics because we place our devices close to the sublingual mucosa (2).

The potential effects of BPA and its derivatives are numerous (2) (5):

- 'cocktail' effects, when several substances are combined;
- non-linear biological responses depending on the dose;
- exposure window with certain periods of life being more sensitive (pregnancy during foetal development, childhood and adolescence during tissue and organ maturation, and then puberty);
- delayed or even transgenerational effects.

The acceptable daily intake (ADI) of BPA has been drastically reassessed by the European Food Safety Authority (EFSA): in 2015, it was 4 µg/kg/day, and in 2023, it was reduced to 0.2 ng/kg/day (6). This is a reduction by a factor of 20,000!

This figure alone illustrates the seriousness of the potential risks associated with BPA exposure.

ORTHODONTIC BONDING MATERIALS

These materials include composite resins, adhesives, primers, resin-modified glass ionomer cements (Cvimar) and self-adhesive adhesives (3).

The resin matrix of bonding materials is composed mainly of methacrylates, including those derived from BPA (BisGMA [glycidyl methacrylate and bisphenol A], BisEMA [bisphenol A ethoxylated dimethacrylate], BisDMA [bisphenol A dimethacrylate]) and those not derived from BPA (UDMA [urethane dimethacrylate], TEGDMA [triethylene glycol dimethacrylate], HEMA [2-hydroxyethyl methacrylate]) (3).

Approximately 79% of composites and 63% of orthodontic adhesives contain BPA derivatives. BisGMA is the most common (> 50%), followed by BisEMA (~ 33%) (3).

In vitro and clinical studies show measurable release of BPA and its derivatives, with peak release occurring within 24 hours after the placement of brackets, clasps or retainers. The levels detected are in the order of micrograms to nanograms/ml.

Biological effects associated with this release are also observed: cytotoxic effects with impaired function and viability of target cells in the oral environment such as gingival fibroblasts, genotoxic effects with impaired genetic material in cells, and oestrogenic effects (7-10).

Other monomers not derived from BPA are also present in orthodontic bonding materials. Udma, Tegdma and Hema are present in more than half of composite resins and orthodontic adhesives (3).

In vitro and clinical studies show a measurable release of these three monomers, with peak release occurring within 24 hours after application (7-10). The levels detected are in the range of micrograms to nanograms/ml.

Similar to what is observed with BPA derivatives, other effects are observed: cytotoxic, genotoxic and oestrogenic with activation of the oestrogen α receptor at low doses for TEGDMA (3).

The effects observed are dose- and time-dependent, sometimes exacerbated by the combination of several monomers (UDMA + TEGDMA) (3).

The release depends (3) on:

- the quality of polymerisation (duration, power, distance from the lamp);
- the setting mode (chemically polymerisable is more toxic);
- environmental conditions (acidity increases leaching).

ORTHODONTIC ALIGNERS

Aligners are currently available in three forms: through commercial systems such as Invisalign®, produced in orthodontic practices by thermoforming, or with certain resins newly on the market by direct 3D printing (11).

Thermoformed aligners are made of medical-grade polymers, mainly polyurethane (PU) and glycolised polyethylene terephthalate (PETG) (11). These materials can be composed of a single layer of polymer or a combination

of several. Only polycarbonate (PC)-based aligners are derived directly from BPA, but they are rarely used today (11). Directly printed aligners are made of methacrylates such as Udma, which is also found in composite resins and orthodontic adhesive systems (11).

Experimental and clinical studies show that thermoformed aligners can release BPA or other toxic organic compounds such as 1,3-bis (1,1-dimethylethyl) benzene, 2,6,10,14-tetramethylheptadecane, or BPS and BPF (BPA substitutes).

Peak release occurs between 24 and 48 hours, then decreases after 7 to 14 days.

Several recent articles also show that microplastics are released and that their effects on the gut microbiota, brain, and cardiovascular system are well established (11-15).

Allergic reactions (types I and IV), particularly related to isocyanates used as PU stabilisers, have also been reported.

Cytotoxic effects, with alterations in the functioning and viability of target cells in the oral environment, such as fibroblasts, and genotoxic effects, with alterations in the genetic material of cells, have also been observed (11-15).

Printed aligners release high levels of Udma (µg/ml) and sometimes exhibit higher cytotoxicity than thermoformed aligners, hence the importance of strictly following the manufacturers' post-treatment recommendations (15).

CLINICAL RECOMMENDATIONS

To limit our patients' exposure to potentially toxic compounds, several clinical recommendations can be made (2).

For bonding materials:

- follow the manufacturer's instructions (time, power, light-curing distance);
- use a powerful polychromatic lamp (> 1000 mW/cm²);
- place the optical fibre as close as possible to the bracket or retainer wire;
- perform polymerisation under glycerine gel for retainers;
- rinse thoroughly with water spray after bonding or removal;
- carefully remove excess resin;
- consult the product safety data sheets (MSDS) (often incomplete);
- favour materials without BPA derivatives.

For aligners (11):

- rinse the trays before first use;
- replace cracked or broken aligners;
- follow the manufacturers' post-treatment recommendations (printed aligners);
- Inform patients that they should:
- Avoid aggressive mouthwashes, acidic or hot drinks.
- Refrain from eating or drinking while wearing the aligners.
- Clean with warm water, mild soap and a dedicated brush.
- Maintain good oral hygiene (an acidic pH increases leaching).

CONCLUSION

Recent research confirms measurable leaching of BPA, Udma, Tegdma and other compounds from bonding materials and orthodontic aligners. Although no major acute risks have been demonstrated to date, the potential long-term effects (endocrine, cytotoxic, genotoxic) justify a cautious approach, particularly for sensitive populations (children, pregnant women).

The precautionary principle should be applied:

- favour materials without BPA derivatives, especially in at-risk populations (children and adolescents, pregnant women);
- optimise the polymerisation of adhesives;
- reduce patient exposure to endocrine disruptors;
- inform and raise awareness about good clinical and hygiene practices.

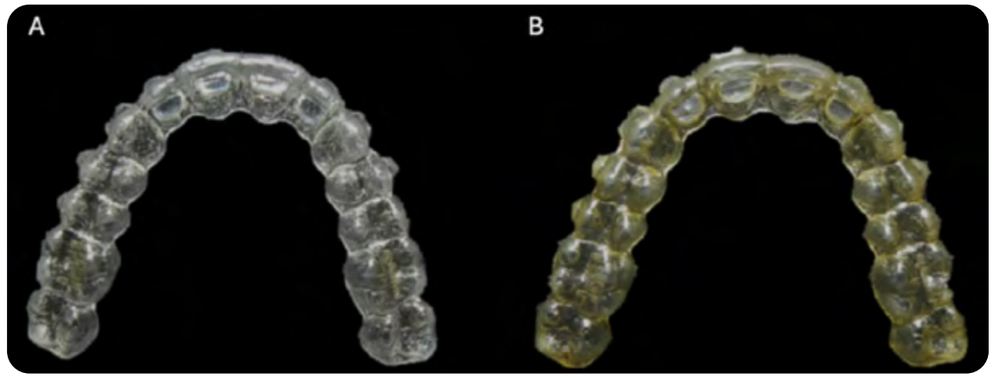

Fig. 1
Example of Invisalign® aligners before use (A) and after 14 days in the mouth (B).
In B, yellowing of the aligner and loss of material can be seen in the areas corresponding to the cusp tips

To view the complete bibliography, please scan this QR Code.

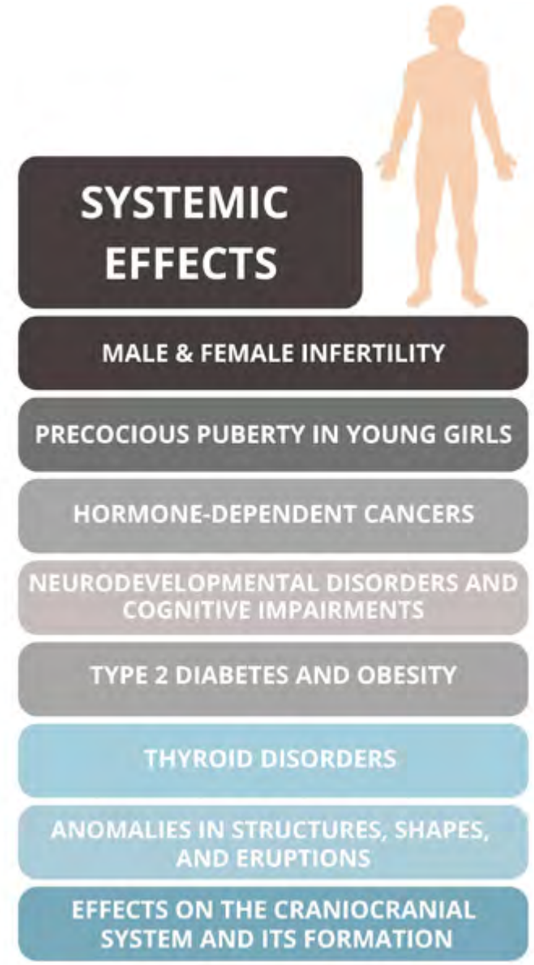

Fig. 2
The systemic effects of endocrine disruptors.

Positive pedagogy:
caring for your patient

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In the June 2025 article, we discussed 'anti-personnel mines' to describe what a certain culture has bequeathed to us under the guise of education and hierarchical relationships.

Sometimes used naively and unconsciously with our patients, these processes, which are contrary to medical ethics, must be brought to light and permanently banned from the educational arsenal of our treatments.

UNLEARNING

Before embarking on positive pedagogy, practitioners must rid themselves of the automatic responses instilled in them by their education and internalised through identification with their educators (see June 2025 article). This requires a great deal of time and patience.

When faced with undesirable behaviour from a patient and in response to what they say, practitioners automatically want to intervene and speak.

Unlearning consists of saying nothing.

This is a very difficult experience, as difficult as not acting when faced with someone threatening us with a knife!

The mental phrase that should guide the practitioner is: 'I remain silent... I say nothing.'

The second mental instruction after this step will be: 'I wait, I listen, I watch'.

Auguste Renoir, the great Impressionist painter, liked to say: "When I start a new canvas, I forget everything I have learned, I look at the canvas and I wait. "

Let's imitate him...

Once this moment of great stress has passed, this non-action, this silence, will give way to a new and very unexpected situation. The relationship with the patient changes and their behaviour evolves pleasantly. They do not make disparaging remarks, they come out of their silence, they become friendly. If they do not speak, they appear calm and serene.

The third stage of this unlearning process is completely disarming! The patient speaks instead of the practitioner...

'I know, you're going to tell me that my teeth aren't clean...'

'You saw that I didn't wear my elastics...'

'I'm bothering you with my tardiness...' '

Then the practitioner can move on to the psycho-educational stage.

SOCRATIC MAIEUTICS

The Greek philosopher Socrates claimed that he did not teach, but that his students 'gave birth to knowledge" (maios in Greek: childbirth). The solution to achieving this is to ask questions.

This is the method used by all communication specialists, including lawyers, to cast doubt on a witness for the prosecution.

As a result, the art of teaching consists solely of finding the right questions to ask. The technique is actually very simple: instead of making a statement, the speaker puts the sentence in interrogative form.

So instead of saying, 'I'm going to teach you how to brush your teeth,' the practitioner will say, 'How should we brush our teeth?'

Instead of saying, 'You should brush your teeth after meals,' the practitioner will say, 'When should we brush our teeth?' '

As the questions are asked, the patient gives the answers and builds their own educational file.

Sometimes it is necessary to guide them with additional questions to put them on the right track.

For example: 'When should you brush your teeth? '

The patient: 'When they are dirty... '

The practitioner: 'And when are they dirty? '

The patient: 'After meals."

This maieutic technique reveals three amusing observations. First of all, we will always be surprised to find that the patient has all the knowledge or guesses what we expect of them, regardless of their age.

At each consultation, my observation is the same:

"Why should I bother explaining what I expect of them when they know perfectly well...! "

The second observation, even more surprising, is that this technique makes the patient active and involved, and once they have stated the actions, they take ownership of them and carry them out.

Hence the rule of health education: motivating a patient means enabling them to take ownership of the means of treatment.

The third observation is a corollary rule: if the patient is not compliant, it is because there is an obstacle preventing them from being so.

It is therefore pointless to threaten them or make them feel guilty, as this discourteous behaviour on the part of the practitioner will not remove the obstacle. The common attitude that patients are uncooperative because they do not feel concerned or are unwilling to make an effort is false, as I see every day in my practice.

REMOVING OBSTACLES

First, it is necessary to classify the various obstacles to positive teaching.

Learning obstacles

The learning obstacles described by Alain Deccache and his colleagues in health education have been catalogued by specialists in educational psychology. They should be systematically included in medical studies in the same way as pharmacology!

Educational diagnosis: a student does not learn if they already know the educational content, and this disrupts the rest of their learning. Nor will they learn if the concepts are too complex in relation to their existing knowledge. The role of the teacher is to question them about the latter.

'Do you know what orthodontic treatment is for?' Depending on the answer, the practitioner can provide additional information.

To learn, you have to want to learn: this is the concept of sensitivity.

The best way to do this is to build suspense.

'Next time, I'll explain how teeth move...'

'Do you know what the relationship is between canines and chewing?'

'Do you think there is a connection between teeth and feet?' "

Availability: both the practitioner and the patient must be available to learn.

If the practitioner has already exceeded the consultation time, they will be forced to rush through the educational session. If the young patient is late for their match, they will not listen to the practitioner...

Coherent verbal expression: short sentences, a structured and coherent educational framework. Too much information kills the message.

Repetition: a simple experiment involves reading a text to someone and asking them what they have retained. According to studies, the result is 20%. If the text is reread, the person retains more. If the text is reread enough times, the person will retain 100%. This is why psychologists have established the following rule: learning is linked to repetition. However, in negative psycho-pedagogy, the practitioner criticises the subject for having to repeat the information because they have retained nothing: this is absurd.

Diversity of media: oral expression can be repeated and enhanced by other techniques – paper, video, the use of an assistant and, above all, the subject themselves. Experience shows that when the subject speaks, they are active and become more effective at memorising (hence the power of maieutics).

Relational obstacles

Very often, students questioned about their poor academic performance have told me: "I don't like my teacher…!" It is indeed essential to establish a positive relationship with a patient in order to achieve effective treatment: the practitioner's or educator's expertise alone is entirely insufficient when faced with the requirement for relational quality. We have shown on other occasions (lectures, books, etc.) that, contrary to a certain egocentric logic, patients comply with treatment more readily to please the practitioner than for their own sake. This is the very foundation of the social nature of Homo sapiens sapiens.

It now appears very clearly to us that the role of a therapist is twofold:

– To establish a diagnosis and a treatment plan appropriate to the disease.

– To establish a relationship of trust.

If the practitioner relies solely on technical competence, this competence can only be implemented if the patient has already decided that trust is linked to the practitioner's expertise (but how could the patient truly judge this?). Therefore, other underlying factors intervene in the treatment process.

This assertion is supported by current medical knowledge regarding hormones (and thus bone growth responses) and chemical mediators that act in various ways on the body, inflammatory processes (and thus the osteoblast–osteoclast mechanism within the dental unit), immune processes, and so forth.

The most effective way to establish a good relationship is to learn conversational hypnosis. This approach involves speaking softly, in an intimate and delicate manner. One should not demand direct answers from the patient, but rather proceed through a form of "sprinkling."

Instead of asking, "Have you worn your elastics?", the practitioner might say: "And if we talked about the elastics (pause), does that cause any difficulty? (pause)…."

Patient's response: "I try to wear them as best I can."

Practitioner: "Very good (encouragement), perhaps we can talk about it a bit more…?"

This method induces a "floating" psychological state in the patient: resistance diminishes, the patient becomes ready to speak about difficulties (and thus obstacles), and accepts the practitioner's guidance (becoming suggestible). A well-known hypnosis experiment among specialists consists of placing a coin on the subject's hand and suggesting that it is very hot. One is astonished to observe the appearance of a red vascular patch on the skin. During this conversation, the patient will quickly reveal constraints, fears, and discomforts that prevent adherence to the treatment. These disclosures may appear unrelated to the treatment. However, if the patient speaks of them, it is because the unconscious associates them. Patient: "I'm having trouble concentrating at the moment because I've changed jobs.

As a result, I can't take care of my children as I would like; I lose my keys, the other day I left without having breakfast…"

The practitioner's role is never to provide solutions, but simply to reassure and attempt to find

the appropriate words that reflect the patient's feelings, always in the form of suggestion rather than assertion.

Practitioner: "You feel disoriented, don't you?"
Patient: "That's it."

Practitioner: "That's completely normal…"

Through this accompaniment, the practitioner has enabled the patient to establish the link between orthodontic treatment (ODF) and the obstacles to wearing elastics. The practitioner allows the patient to discover this connection independently.

Practitioner: "Well, I'm pleased with our conversation…"

Patient: "I think that now I'll be more consistent with the elastics…"

Thus, the most effective form of suggestion occurs without direct intervention

We can observe that relational obstacles to treatment and life-event-related obstacles are interconnected. Seeking an event-related problem and providing a solution does not work. Attempting to correct the relationship in order to improve cooperation does not work either. The practice consists in associating the two, as we have demonstrated.

CONSENT

The concept of consent is the result of the evolution of a society that has recognised and denounced the abuse of power by some citizens over others. It is curious to note that the term is used for both sexual offenders and doctors! A similar situation also applies to all types of service and sales contracts: "I have read and accept the terms and conditions... "

In reality, this concept of consent is an improvement over a situation of abuse, but is it really sufficient?

If a person with malicious intent charms a victim, intoxicates them with a little alcohol or false promises, consent to an intimate act can easily be obtained.

Afterwards, and it is only afterwards that matters, the person who consented will feel abused and victimised.

This is why we believe that medical consent is a legal obligation, but insufficient from a human perspective, in terms of accepting to give one's body to a doctor.

Moreover, in practice, informed consent is a document to be signed... Is it always read by the patient? In any case, this notion raises a very interesting question on a human and ethical level. Because in medicine today (in the past, the authority of the doctor was sufficient to provide care), it is all about establishing a balanced relationship that allows for care to be given and received with confidence.

Clinics for sexual victims, neurotics and divorcees teach us that in these failing relationships there is a lack of sharing. It is this concept that we wish to bring to the reader's attention.

It is this notion that automatically triggers both parties' desire to give, to give the other their intellectual and physical abilities to fulfil a mission.

It is also this notion that allows both parties to accept the difficulties of the mission, or even its failure.

Sharing means first and foremost sharing the reason for one's presence. Very often, the patient is asked about the reason for their consultation, but the practitioner remains silent about their intentions.

Imagine that you are going on holiday with a friend, and they exclaim, 'Oh! I would love to go to Madrid!'.

Your friend offers to buy the tickets.

And you say nothing, you agree...

But what is your desire? Is it different?

If you have the same desire, the trip can go ahead, but if your desire is different and you accept this plan, isn't there a lack of sharing? What will happen when the first inconvenience arises? What would be the sharing?

The sharing will be to say, 'I'd really like to go to Florence.' Then you'll discuss it. Do both? Madrid this year, Florence next year? Or other solutions?

In any case, the final decision will be shared and, whatever it is, the other person will be aware of your desires and will take them into account.

Let's apply this to the ODF consultation.

The practitioner: 'What is the reason for your visit?'

The patient: 'My teeth are protruding, and I would like to have them corrected.'

The practitioner examines the patient and notices a Class II Division 1 malocclusion.

The practitioner: 'But you see (showing the patient's teeth in a mirror), all the teeth in your upper jaw are protruding.' It's more complicated than you think...

What happens to the patient? They are surprised, they hear that it is going to be long, complicated, expensive... painful. They are naturally anxious, perhaps even fearful, and must trust the practitioner who 'knows what they are doing'.

Our relationship therefore evolves based on consent: explaining what Class II is, how it is treated, what the risks are, and the treatment time.

What would sharing be? Like Florence?

What does Florence represent in ODF?

The practitioner must express their desire:

The practitioner: You see, in orthodontics, what we are looking for is balance between the upper and lower teeth. To achieve this, they need to be well aligned and fitted together. Then your teeth will be able to chew for many years without wearing down, they will be well aligned, you will be able to clean them better and avoid cavities and gum disease, which in the long term can lead to tooth loss.

That's it, what I want is my job, to offer you long-term health.

Doesn't the patient feel that this response shows genuine interest in them? Do they have the space to discuss their expectations and compare them with yours? Will they be surprised by your technical proposals?

CONCLUSION

Some might imagine that the description just given would be applied according to the patient, and depending on the treatment needs and technical therapeutic means. For this patient, a quad-helix with a little repetition; for that patient, a propeller and a little maieutics...

Let us be careful not to equate positive pedagogy with a range of techniques. What we have described must be integrated by the practitioner by repeating it with each patient. This repetition is part of their medical training. As with any learning process, it will require patience and time during consultations. Once this learning period is over, their behaviour will be different and natural, the anti-personnel weapons will be removed, and at every moment of their consultation, they will allow the patient to benefit from the psychosomatic, friendly and empathetic effects of this new, effective and ethical behaviour. They will then be able to make two observations:

- Treatments are shorter, as the responses will be behavioural and hormonal.

- The practitioner's comfort will allow them to finish their consultations with complete peace of mind and to generate the same comfort in their colleagues.

Some clinical cases presented in conference rooms are still marked today by the curious phrase: 'if the patient is cooperative...'.

I hope that this comment will become incongruous in a modern medical relationship.

Therapeutic effects of maxillomandibular advancement surgery with counter-clockwise rotation

On obstructive sleep apnoea-hypopnoea syndrome and the upper airways: prospective study

GUEST SPEAKER SBR CONGRESS 2025 COLMAR

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INTRODUCTION

Obstructive sleep apnoea-hypopnoea syndrome (OSAHS) is a chronic and common condition, affecting approximately 4% of adult men and 2% of adult women, with prevalence increasing with age.

It is characterised by repeated episodes of partial (hypopnoea) or complete (apnoea) obstruction of the upper airways during sleep, often associated with micro-awakenings and sleep fragmentation, leading to cardiovascular, metabolic and neurocognitive repercussions, as well as a significant deterioration in quality of life.

The treatment of OSA is therefore a major public health issue. Current management, according to the recommendations of the Haute Autorité de Santé (1), is mainly non-surgical.
Continuous positive airway pressure (CPAP), considered the gold standard, and mandibular advancement devices (MADs) are symptomatic treatments. They improve patients' sleep in order to reduce their symptoms, but they have no real benefit on long-term mortality or cardiovascular risk factors (2). Patient adherence to these devices is very low.

Surgical treatment is only recommended in cases of refusal or intolerance to CPAP or MAD. Maxillomandibular advancement (MMA) surgery, and in particular the anti-clockwise rotation (ACR) technique, is an interesting alternative (3-4) offering a lasting solution. This technique aims to permanently widen the pharynx and clear the retropharyngeal and retrobase lingual space by pulling the hyo-lingual muscle mass forward, while limiting the aesthetic impact on the nose and upper lip.

Orthognathic surgery combined with orthodontic treatment has proven effective in the treatment of Sahos (4), with success rates of around 90% and a significant improvement in the apnoea-hypopnoea index in 100% of cases.

The primary objective of our study was to evaluate the therapeutic effects of maxillomandibular advancement surgery with counterclockwise rotation on sleep recording parameters. The secondary objective was to evaluate the morphological effects on the upper airway.

METHODS

A prospective, observational cohort study was conducted in 2023 and 2024 on 52 adult patients with OSAHS defined by polysomnography (PSG) or ventilatory polygraphy (VP).

All patients underwent maxillomandibular advancement surgery combined with counter-clockwise rotation via posterior maxillary egression (ARA e 15-20 protocol), thanks to precise digital 3D planning (Fig. 1) carried out by Dr Éric Solyom, a maxillofacial surgeon practising in Toulouse (La Croix du Sud clinic) and Paris (Geoffroy Saint-Hilaire clinic).

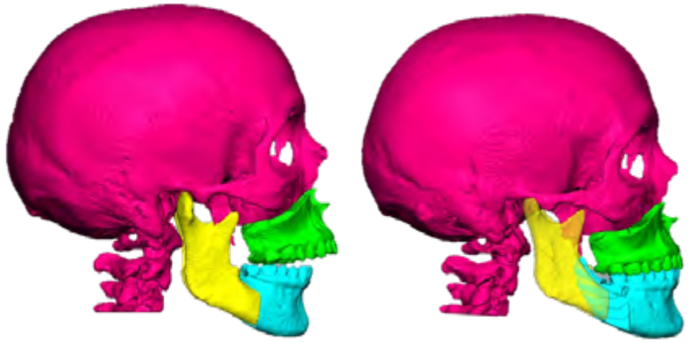

Fig. 1
3D planning of maxillo-mandibular advancement surgery with counterclo-ckwise rotation via posterior maxillary egression (Dr. Eric Solyom).

Clinical and functional parameters were assessed preoperatively (T0) and three months postoperatively (T1).

The primary endpoints included sleep recording parameters such as the apnoea-hypopnoea index (AHI), the oxygen desaturation index (ODI) and daytime sleepiness using the Epworth score (5) (Fig. 2).

Secondary endpoints included morphological variables of the upper airway such as volume (VVAS) and minimum sagittal cross-sectional area (Smin), measured by 3D segmentation on craniofacial CT scans at T0 and T1 (Fig. 3).

Statistical analyses were performed by Adèle Brotons, associate clinical director at the universities of Marseille, using R Studio© software.

A significance threshold of $p < 0.05$ was used. The normality of distributions was verified using the Shapiro-Wilk test. Pre -and post-operative comparisons used paired t-tests or Wilcoxon signed-rank tests depending on the distribution of the data.

Correlations between surgical movements and variations in sleep parameters were assessed using Spearman's test. Finally, intra-operator repeatability and inter-operator reproducibility of radiological measurements were analysed using Lin's correlation and concordance coefficient (LCC).

Situation	Chance of falling asleep			
Sitting reading	0	1	2	3
Watching television	0	1	2	3
Sitting, inactive in a public place (movie theater, theater, meeting, etc.)	0	1	2	3
As a passenger in a car (or public transportation) traveling nonstop for 1 hour	0	1	2	3
Lying down in the afternoon when circumstances allow	0	1	2	3
Sitting while talking with someone	0	1	2	3
Sitting quietly after an alcohol-free lunch	0	1	2	3
In a car that has been stationary for a few minutes	0	1	2	3
	TOTAL			/24

Fig. 2 : Epworth Sleepiness Scale.

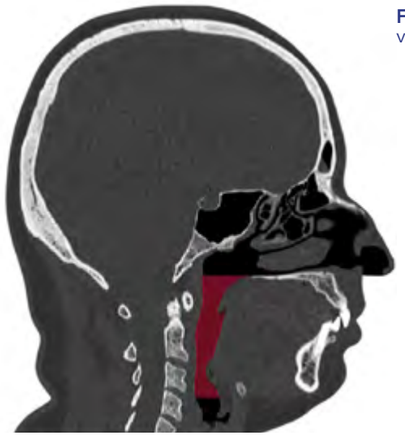

Fig. 3 : Determination of the airway volume measurement area (in red).

RESULTS

The sample included 52 patients (63.5% men, 36.5% women), with a mean age of 42.8 ± 13.9 years. Patients were divided into three groups according to their skeletal class: 38 patients in class II (73%), 12
in class I (23%) and 2 in class III (4%).

The results show a significant improvement in all parameters studied for the overall sample as well as for the class I and II sample, with the exception of the reduction in DOI for class I patients.

No significant results could be demonstrated in class III patients due to the small sample size.
On average, the AHI decreased from 31.6 ± 16.7 to 7.9 ± 6.7 events/hour, corresponding to a 75% reduction ($p < 0.001$). The surgical success rate (defined as an AHI < 20/hour and a reduction of ≥ 50%) was 84.3%, while the clinical cure rate (defined as an IAH < 20/h and reduction ≥ 50% + disappearance of symptoms included in the AASM definition + discontinuation of CPAP/OAM treatments) reached 98%.

The ODI decreased from 20.8 ± 17.5 to 6.1 ± 5.9 events/hour, representing an average reduction of 70.7% ($p < 0.001$), and the Epworth score decreased from 12.2 ± 5.3 to 4.4 ± 3.4, representing an average decrease of 64.1% ($p < 0.001$), reflecting a significant reduction in daytime sleepiness.

Morphologically, the volume of the upper airways increased from 13,476 ± 6,115 mm^3 to 22,562 ± 9,773 mm^3, representing a significant increase of 67.4% ($p < 0.001$), and the minimum sagittal section from 7.9 ± 2.6 mm to 13.1 ± 3.9 mm, representing a significant increase of 65.9% ($p < 0.001$) (Fig. 4).

A moderate but significant negative correlation was observed between the extent of mandibular advancement and the reduction in AHI ($r = –0.34$; $p = 0.018$), suggesting a key role for mandibular advancement in functional improvement. Conversely, no significant correlation was found between maxillary advancement and sleep variables. Based on our simulations, 1 mm of posterior maxillary extrusion would allow for up to 3 mm of additional mandibular advancement, which is a major advantage for optimising both functional and aesthetic results.

The intra-operator repeatability (CCL = 0.98) and inter-operator reproducibility (CCL = 0.97) of the VVAS and Smin measurements were considered excellent, confirming the reliability of the measurement protocol.

DISCUSSION

Several factors must be taken into account when interpreting our results. Intra-night variability related to discomfort with the sleep recording device and the subjectivity of the Epworth score may influence the measurements.

Despite these limitations, the results of our study are consistent with the literature (6-9), which reports similar significant reductions in AHI, ODI and daytime sleepiness after OSA treatment. Christino's 2021 study (9) even showed the superiority of ARA over conventional MMA, and the published success rates, ranging from 80 to 100%, are comparable to ours.

With regard to the upper airway, the use of craniofacial scanning in the supine position allowed for accurate 3D analysis consistent with the sleeping position, although it involves more radiation than CBCT. However, a strict acquisition protocol must be implemented, as swallowing movements, tongue positioning and head posture can influence the results (10). The variability of anatomical definitions of the upper airway and segmentation protocols remains an obstacle to data comparability (11-12).

Our results confirm the volumetric increases reported in the literature (13-15) and are consistent with Christino's 2021 study (9) on the superiority of ARA. We also focused on analysing the minimal sagittal section, as this is a key parameter for VAS resistance according to Poiseuille's law:

$$\left(R = \frac{8\eta L}{\pi r^4} D_v \right).$$

The main limitations of our study are the absence of randomisation and a control group, due to ethical constraints related to surgical procedures, the low representation of the Class III sample, which does not allow any conclusions to be drawn about it, and the postoperative follow-up limited to three months.

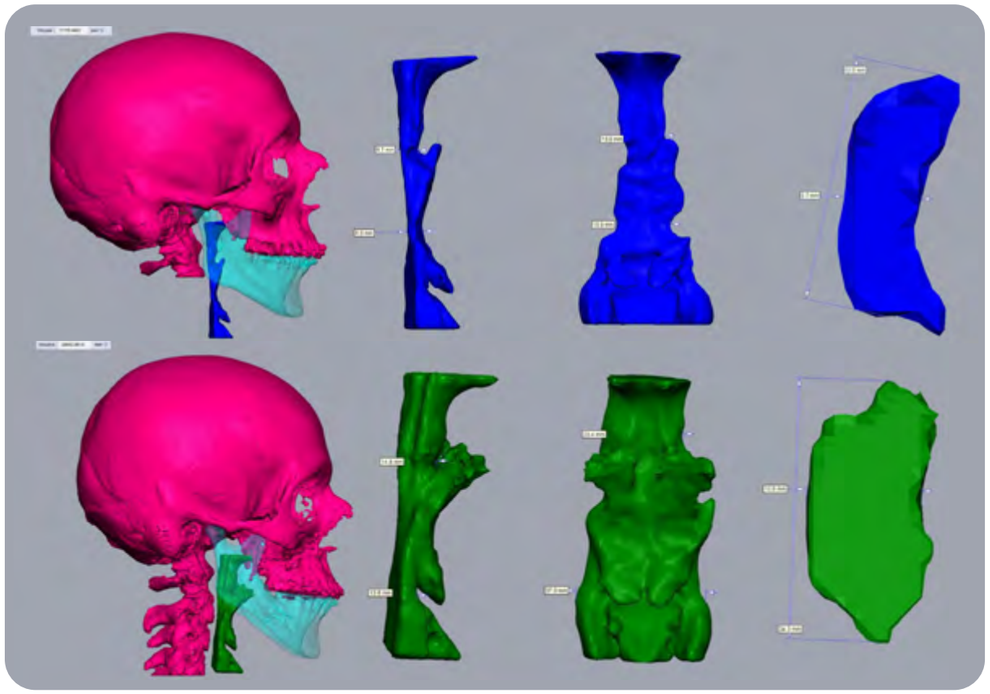

Fig. 4 : Study of the upper airways pre-operatively T0 (blue) and 3 months post-operatively T1 (green).

CONCLUSION

Maxillomandibular advancement surgery with counterclockwise rotation is an effective treatment option and should be offered in the management of patients with sleep apnoea.

Functionally, it allows for a major reduction in the main parameters of sleep recording (AHI, ODI, Epworth score), thanks to the overall widening of the upper airways and the removal of compression areas, with a high surgical success rate.

This procedure would limit the aesthetic impact on the nose and upper lip of conventional UVA, although this point requires further objective studies to be confirmed.

In our cohort, 98% of patients were able to be weaned off conventional treatments (CPAP or OAM) with a significant improvement in their symptoms, highlighting the potentially curative nature of this approach.

The study is currently ongoing to evaluate the long-term stability of the results and explore the impact of this surgery on cardiovascular risk factors, thus opening up important prospects for patients' overall health and quality of life.

To download the bibliography, **please scan the QR Code.**

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