

A Silent Revolution

Dental Occlusal Correction for Snoring



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In today's fast-paced world, it's easy to overlook the fundamental act of breathing. Yet, the prevalence of mouth breathing presents a significant threat to our well-being. What may start as a seemingly innocuous habit can quickly escalate into a cascade of health issues, affecting not only our oral health but also our overall quality of life.

Clinical research has unveiled a myriad of symptoms linked to mouth breathing, ranging from enlarged adenoids and tonsils to childhood hyperactivity. However, the ramifications extend far beyond physical discomfort. Mouth breathers often grapple with chronic fatigue, morning headaches, even cognitive and digestive problems.

The manner in which we inhale and exhale profoundly influences our overall health and well-being. In my forthcoming book, 'Dental Aspects of Snoring and Mouth Breathing: Life's Blueprint - Early Detection of Micrognathia in Utero,' I delve into the intricate realm of nasal breathing and illuminate the hazards posed by habitual mouth breathing."

However, in this article, I wish to focus on Adult Snoring based on my one case study, which was published in the World Sleep Society.

Patient Aged 73 years was referred to me from the ENT department for non-surgical correction of snoring. Upon examination, the case revealed stomatognathic structural changes due to gross attrition (wear and tear) of teeth (Fig. 1). Indian Association Of Surgeons For Sleep Apnea (Fig. 2). The patient

exhibited a scalloped tongue, a condition where the tongue's undersurface displays indentations (Fig. 3). This occurs because the tongue, under space restriction, continuously exerts pressure to push the mandible forward in an attempt to reclaim lost space. However, due to the inability to do so, the tongue becomes scalloped along its edges.

Tooth Wear and Tear is A High Risk for OSA

This wear and tear of the teeth causes loss of occlusal vertical height (OVD), which shifts the TMJ, and this backward shift of the lower jaw causes constriction of the PAS (Pharyngeal Air Space).

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J Durán-Cantolla, MH Alkhraisat, C Martínez-Null et al in the year 2015 conducted a study to estimate the frequency of obstructive sleep apnea syndrome (OSAS) in dental patients with tooth wear, and to assess the role of dentists in the identification of patients at risk of OSAS. Sleep questionnaires, anthropometric measurements, and validated respiratory polygraphy were performed. The study concluded that tooth wear could be a tool to identify those patients at risk of having OSAS. This highlights the importance of dental professionals to identify and refer patients with OSAS.

The Potential Effect of Teeth Wear And Tear / Teeth Loss on OSA has Received Less Attention

The Risk of OSA Increases by 2% with Every Additional Tooth Loss

According to Sanders et al (2016) a study was conducted to investigate the relationship between tooth loss and signs and symptoms of Obstructive Sleep Apnea in a representative sample of general US population. Study showed that prevalence of high risk of OSA increased 2% for each additional tooth loss. OSA was 25% greater in those missing 5-8 teeth, 36% greater in those missing 9-31 teeth and 61% greater in edentulous concluding tooth loss as an independent risk factor for OSA.

The loss of anterior guidance and posterior stop indicated that the jaw had shifted backward, exerting pressure on the Pharyngeal Air Space (PAS) (Fig. 4). Encroaching upon the Pharyngeal Air Space (PAS) and thus constricting the airway (Fig. 5). This leads to turbulence of airflow, causing vibration of the soft tissue, which is heard as snoring (Fig. 6).

So, there are two primary reasons here in this case for snoring:

- The backward movement of the mandible.
- The tongue rolling back due to a lack of sufficient space, encroaching upon the Pharyngeal Air Space (PAS)

This narrowing of the airway increases the speed and velocity of airflow, leading to greater tissue vibration and resulting in the characteristic sound of snoring. A sleep polysomnography was conducted to record the Apnea-Hypopnea Index (AHI), which measures the frequency of snores. Additionally, the patient reported experiencing temporal region headaches, which could be attributed to the backward displacement of the lower jaw caused by wear and tear or attrition.

This shift in the temporomandibular joint (TMJ) was responsible for prolonged incorrect forces exerted on the TMJ, emphasizing the importance of accurate optimal forces for resolving his issues.

Once the diagnosis was complete, a comprehensive treatment plan was developed, tailored to the patient's individual needs and desires, as well as addressing specific dental issues. Following consent, preliminary procedures such as root canal treatment (RCT), subgingival scaling, and crown preparations were initiated.

Furthermore, other concerns such as snoring and bruxism were discussed and included in the treatment plan. This involved detailed conversations with the patient regarding the objectives and expected outcomes of the treatment. To accurately assess the relationship between the maxilla and the temporomandibular joint (TMJ), the angulation of the maxilla was recorded using a facebow (Fig. 7).





Fig. 1



Fig. 2

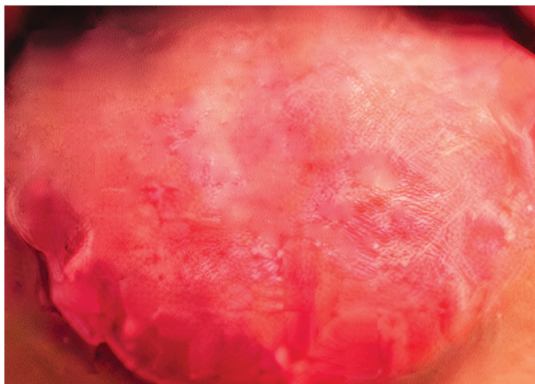


Fig. 3

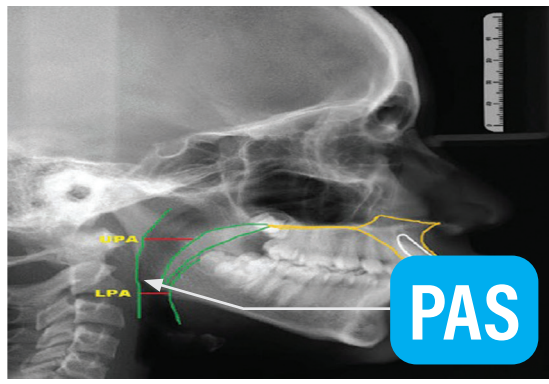


Fig. 4

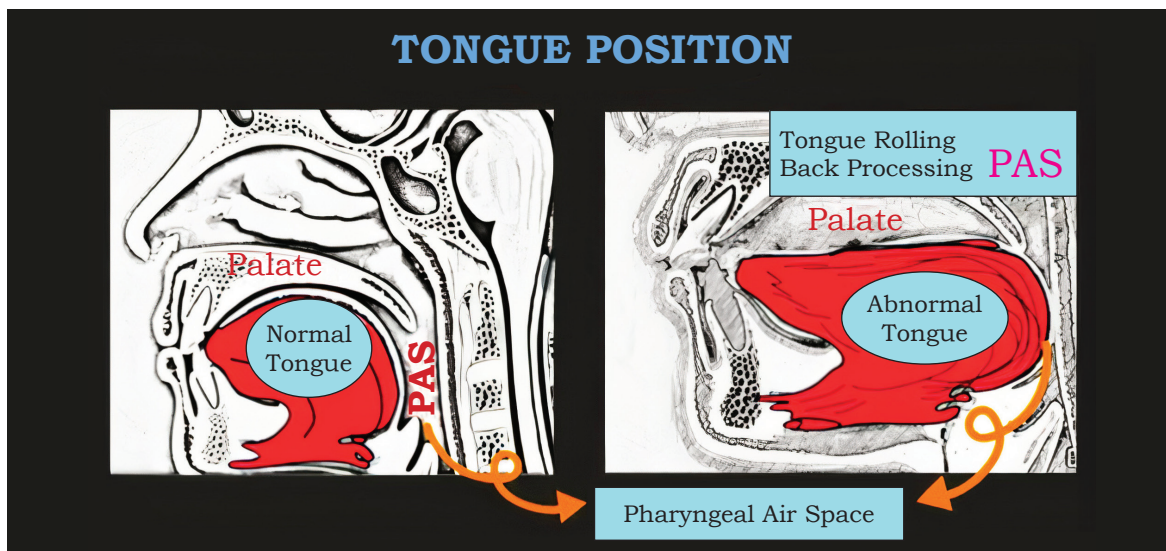


Fig. 5

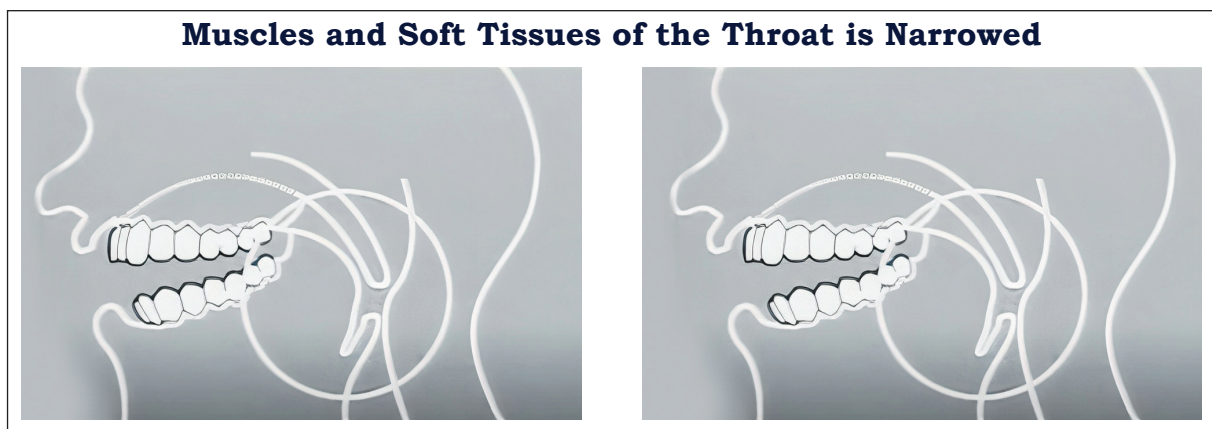


Fig. 6

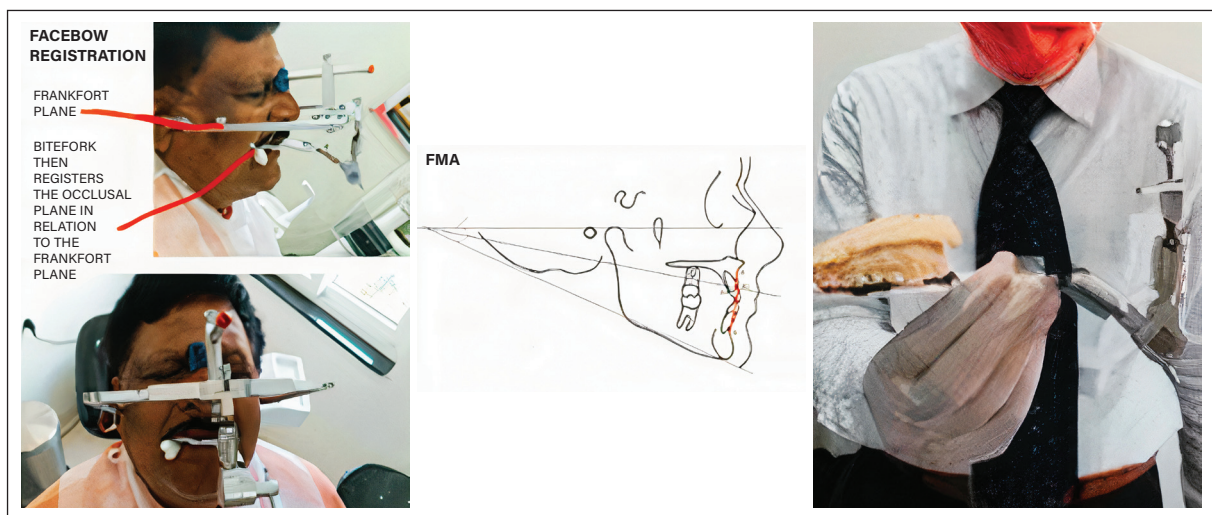


Fig. 7

To Simplify for Non-dental Professionals

A face bow is a vital tool in dentistry and orthodontics used to measure the angle of the upper jaw in relation to the temporomandibular joint (TMJ). By accurately replicating the position of the patient's jaw in an articulator, which mimics natural jaw movement, face bows assist in diagnosing and treating bite problems effectively.

Precise measurements obtained with a face bow aid in safeguarding TMJ health by reducing stress on the joint, thereby minimizing discomfort or disorders such as TMJ dysfunction. Properly measuring the angle of the upper jaw contributes to achieving optimal bite function, preventing issues like tooth wear and jaw pain.

As I didn't have a Dfine Intraoral Scanner at the time, I had to use conventional methods involving putty and light body materials to record the measurements, and models were then prepared accordingly (Fig. 8).

Bite registrations were conducted using polyvinyl siloxane (PVS), PVS is a material commonly employed in various dental procedures such as bite registration, stent fabrication, and restoration measurement. PVS impression materials are favored in dentistry due to their excellent handling characteristics, favorable patient tolerance, and reliable physical properties. It's advised to avoid the use of wax for bite registration as it can lead to distortions and inaccuracies.

It is crucial to emphasize here, that even when preparing a single posterior tooth, precise bite registration is essential. This ensures a special 360-degree orientation and facilitates the re-establishment of accurate contact points (Fig. 9).

With the Dfine Intraoral Scanner, the concept of bite registration has undergone a revolutionary transformation. Within seconds, precise and accurate bite recordings can now be effortlessly captured.



Fig. 8

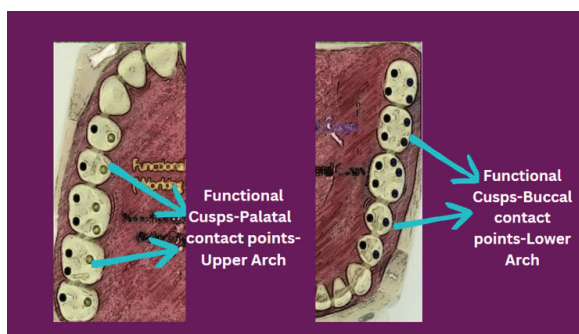


Fig. 9



Fig. 10



Fig. 11



Fig. 12

Temporary crowns were provided to assess whether the recorded occlusal vertical dimensions (OVD) were accurate and to observe the impact on the individual's temporomandibular joint disorder (TMD) and snoring. This allowed for a thorough evaluation of whether these issues improved or worsened following the intervention.

After observing the patient for over a month, it became evident that his condition was significantly improving. He reported no complaints regarding dental or temporomandibular joint (TMD) pain, and his previously problematic snoring had notably diminished. With the patient's compliance and the positive response observed, I concluded that the recorded dimensions were truly accurate. Therefore, I deemed it appropriate to replace the

temporary crowns with the originals(Fig. 10-11). In the bisque trial, the bite parameters were meticulously rechecked for grip and contact points, with subsequent fine adjustments made(Fig.12).

Following this, the patients underwent T Scan analysis to quantify optimal forces, a critical aspect of treatment aimed ensuring accurate bite forces and bite function. The corrections derived from the T Scan analysis were found to be remarkably minimal, underscoring the precision in recording measurements and their translation in the laboratory(Fig. 13). Following the T Scan analysis and subsequent DTR therapy, the patient was reassured that the forces exerted on the teeth were optimized to an ideal level, supported by scientific evidence. This meticulous approach ensured that

the bite was balanced, promoting relaxation of facial muscles and effectively alleviating symptoms associated with temporomandibular disorders (TMD). With scientific validation and personalized care, the patient experienced significant relief from pain, tension, and headaches, highlighting the efficacy of DTR therapy in achieving optimal results for a healthy TMJ. Repositioning the mandible forward to alleviate the Pharyngeal Air Space (PAS) was the key focus and it was achieved meticulously.

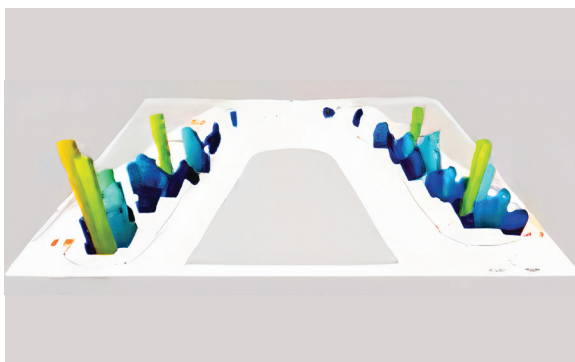


Fig. 13

A full mouth rehabilitation was performed, effectively bringing the mandible forward. As evidenced in the images, this forward movement of the mandible allowed visibility of all lower teeth. Importantly, this adjustment relieved compression on the pharyngeal air space, resulting in the cessation of the patient's snoring (Fig. 14a & 14b).

Collapsed VS Restored Occlusal Vertical Dimension(OVD)

- Mandible is moved forward
- Double chin appearance is gone
- Looks younger
- Anterior collapsed face height is restored



Fig. 14a



Fig. 14b

The successful outcome of this case, demonstrating control over approximately 3700+ instances of snoring per night, was published in the World Sleep Society Journal, Volume 2, July-September 2019.

It is noteworthy that this achievement was attained without the need for ENT surgery, taking into consideration the patient's age and other pertinent factors. These findings were based on a new sleep study, further validating the effectiveness of the treatment approach. "In closing, our journey through this case presentation has illuminated the intricate interplay between dental aspects and snoring, showcasing not only the depth of our understanding but also the breadth of impact that snoring can have on an individual's overall well-being. From its cardiovascular implications to its far-reaching social and psychological effects, we've witnessed the profound significance of early intervention and comprehensive patient care.

As we navigate the ever-evolving landscape of dental aspects in snoring, marked by innovation and collaboration, let us remain steadfast in our commitment to holistic patient care.

As dental practitioners, we hold a unique position to address snoring not merely as a nuisance, but as a multifaceted medical condition deserving of our utmost attention and expertise.

Together, let us continue our collective efforts to enhance the quality of life for countless individuals, one night of peaceful sleep at a time. For in the pursuit of better health and well-being, every breath — and every dream — truly matters.