

(CASE REPORT)



Obstructive Sleep Apnea Syndrome (OSAS) management in Dento-Facial Orthopedics

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Abstract

Introduction: Obstructive Syndrome Apnea (OSA) has a worldwide incidence of 0.3 to 5%, predominantly in men. This pathology causes an obstruction of the upper airway with a significant risk of asphyxia and sudden death. The objective of our study was to report the case of a patient with OSA treated in Dento-Facial Orthopedics.

Observation: This was a 41-year-old man with risk factors for OSA, dento-arch dysmorphism, and maxillo-mandibular bone deformity. The nasofibroscope revealed a narrowed oropharynx, an airway obstruction in the supine position. The polysomnography concluded to the diagnosis of OSA in its severe form with 45 apneas in one night, an oxygen saturation of 85%. The treatment consisted of a mandibular advancement prosthesis.

Discussion: OSA is a serious pathology under-diagnosed in Madagascar. Repeated apneas and hypopneas are associated with significant decreases in oxygen partial pressure. The most reliable and widely used test in the world is polysomnography. Treatment of OSA with positive pressure allows the increase of the pressure inside the pharynx. Mandibular advancement prostheses allow for promandibulia. These therapeutic devices improve the quality of life of our patient. By traction system, the device allows a mandibular protrusion during sleep.

Conclusion: The treatment of OSA consists of a multidisciplinary management including Dento-Facial Orthopedics and dental prosthesis.

Keywords: Obstructive sleep apnea; Treatment; Dento-Facial Orthopedics; Republic of Madagascar

1. Introduction

This work takes part in a therapeutic interest on the highlighting of the importance of the management in Dento-Facial Orthopedics of the Obstructive Sleep Apnea Syndrome (OSAS).

The Obstructive Sleep Apnea Syndrome (OSAS) is defined by an Apnea Hypopnea Index higher than 15 per hour of sleep. The diagnosis was retained when more than 5 apneas and/or hypopneas per hour of sleep occurred. The Apnea

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Hypopnea Index must be accompanied by excessive daytime sleepiness and 2 other clinical criteria including: severe daily snoring, morning headaches, reduced alertness, libido disorders, hypertension or nycturia [1].

Approximately 2% of women and 4% of men between 30 and 60 years of age present more than five apneas or hypopneas per hour of sleep associated with daytime symptoms [2].

This pathology is at the origin of an obstruction of the upper airway with a significant risk of asphyxia and sudden death.

Dento-Facial Orthopedics is involved in the detection and management of these patients [3].

What would be the place of Dento-Facial Orthopedics in the management of a patient suffering from Obstructive Sleep Apnea Syndrome (OSAS)?

2. Observation

We report here, a case of a 41 year old man, complaining of snoring for 10 years, as well as erectile dysfunction perceived by the spouse.

Personal history was alcohol intake and frequent allergic coughs associated with excessive daytime sleepiness at work, a Body Mass Index of 25, and libido disorders.

Exo-oral examination, in the vertical sense, revealed dilatation of the nostrils, vertical insufficiency of the lower face and a decrease in the Vertical Occlusion Dimension.



Vertical examination (Source: Dr Mariette)

Figure 1 Exo-oral photograph (face)

In the transverse direction, we noticed an asymmetry of the face with a left predominance, whose median sagittal points were not aligned.



Transverse examination (Source: Dr Mariette)

Figure 2 Exo-oral photograph (face)

The profile was convex, with a marked labio-chin sulcus, and a retrogenic.



(Source: Dr Mariette)

Figure 3 Exo-oral photograph (profile)

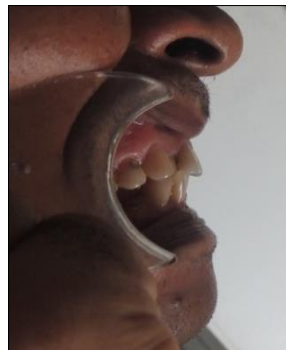
On endo-buccal examination, we noted a high Decayed/Filled/Missing Tooth Index of 15, negative Dento-Arcade Dysharmony, and true macroglossia.



(Source: Dr Mariette)

Figure 4 Endo-buccal photographs

The overjet is quite high at 3mm.



(Source: Dr Mariette)

Figure 5 Endo-buccal photograph (profile)

In relation to the functions, we retained: a pathology of breathing including snoring, a unilateral left mastication, as well as a nasal voice.

The Ear Nose and Throat (ENT) examination by nasofibroscopy revealed a narrowing of the oropharynx in the sitting position and a posterior tilt of the base of the tongue, partially obstructing the glottic tract in the supine position.

Chest radiography incidentally revealed scoliosis.



Figure 6 Chest X-ray (front)

The cranial radiographs allowed us to perform a cephalometric analysis finding a Class II Skeletal and a low tongue.

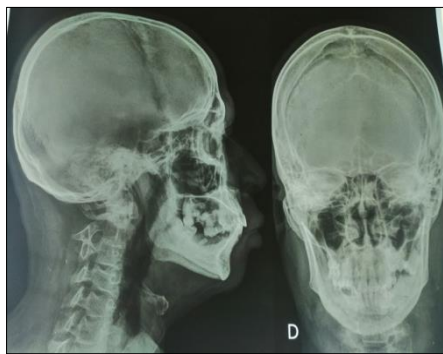


Figure 7 Radiographs of the skull (profile, face)

The examination of the cast allowed us to evaluate a negative Nance index.



(Source: Dr Mariette)

Figure 8 Photograph of the casting

Table 1 Polysomnographic examination

Evaluation criteria	Normal values	Patient
Number of apneas	< 5 / h	412 / 8h
Apnea hypopnea index	< 15	53
Oxygen saturation (%)	> 90	88

All of our patient's positive signs pointed to a diagnosis of severe Obstructive Sleep Apnea Syndrome.

We proposed active treatments including: a continuous positive airway pressure device, a mandibular advancement orthosis, Ear Nose and Throat (ENT) surgical therapy, as well as functional orthopedic therapies for functional disorders.

The evolution was satisfactory for the patient as well as for the practitioner by a clear improvement of the tracings, a decrease in the number and duration of apneas with an Apnea Hypopnea Index of 35.7/h (versus 53/H). We also note an improvement in oximetry with an average oxygen saturation of 91% (versus 88%).

3. Discussion

Our patient has risk factors for the development of sleep apnea including obesity, male gender, age, black race, and alcohol intake.

In Obstructive Sleep Apnea Syndrome (OSAS), during sleep, the tone of the pharyngeal dilator muscles decreases and, if the anatomy predisposes, pharyngeal obstruction occurs.

The individual is diagnosed by the presence of more than five apneas/hypopneas per hour of sleep associated with a daytime symptomatology defining the sleep apnea syndrome [4].

Sleep disruption leads to daytime cognitive impairment in the form of inattention and sleepiness. Repeated apneas and hypopneas are associated with significant decreases in oxygen partial pressure [5].

The most reliable and widely used examination in the world for the diagnosis of sleep apnea is polysomnography [6]. This examination was performed in our patient in collaboration with the pneumology department of the University Hospital of Mahajanga.

The most effective and commonly used treatment is CPAP (Continuous Positive Airway Pressure), effective and non-invasive, reserved for severe cases. This treatment allows to normalize the night breathing and to suppress the micro-awakenings. However, according to the literature, its efficiency is unfortunately much lower with undesirable effects for some patients. The side effects are not negligible and include choking, skin lesions on the mask support areas, rhinitis, nasal and oral dryness and conjunctivitis in case of air leakage in the eyes [6].

In the meantime, we have introduced a mandibular advancement orthosis (MAO) that allows the mandible and tongue to be advanced during the night, thus reducing the risk of pharyngeal collapse during sleep. This device consists of two dental impressions connected by a traction system. It puts in tension the tissues of the soft palate, the base of the tongue (ascension and advance of the hyoid bone), the walls of the pharynx. It is an orthopedic device for correction of mandibular retrognathia in skeletal class II. Often indicated to stimulate mandibular growth in pediatric orthopedics. Despite its indication in mild to moderate Obstructive Sleep Apnea Syndrome (OSAS) as well as in the treatment of simple snoring, this treatment is much less cumbersome than the positive pressure device by the fact that the patient can get comfortable in any position during sleep. The side effects are rather managed by our patient thanks to the recommendations given before wearing [7].



(Source: Dr Mariette)

Figure 9 Endo-buccal photographs with OAM (left and right profiles)

Myo-functional re-education, weight reduction helps to improve the patient's condition by normalizing the Body Mass Index, modification of the sleeping posture avoiding dorsal decubitus, and the cessation of alcohol as well as sports are part of the measures accompanying the treatments.



(Source :Dr Mariette)

Figure 10 Lingual rehabilitation



(Source: Dr. Mariette)

Figure 11 Proper posture for sleep

4. Conclusion

Obstructive Sleep Apnea Syndrome (OSAS) is a serious pathology under-diagnosed in Madagascar, which can be life threatening. Its treatment consists of a multidisciplinary management, which includes Dento-Facial Orthopedics.

Faced with Obstructive Sleep Apnea Syndrome (OSAS), the orthodontist has a role in the treatment by performing an orthopedic therapy of mandibular advancement by ensuring to restore or maintain a harmonious maxillo-mandibular balance.

We can say that our case was a success by a functional improvement of our patient by avoiding any risk of vital damage.

Compliance with ethical standards

Acknowledgments

All individuals who participated in the study.

Disclosure of conflict of interest

No conflict of interest to declare.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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