Obstructive sleep apnoea - A case report

Sodawala J*, Agrawal K*
*Department of Orthodontics, Rungta College of Dental Sciences & Research, Bhilai

ARTICLE INFO

Keywords:
OSA, Obstructive sleep apnoea,
Sleep hyponea

Corresponding Author:
Dr Javed Sodawala
Senior lecturer,
Department of Orthodontics,
Rungta College of Dental Sciences & Research,
Kohka-Kurud road, Bhilai (CG)
Contact : :+918109747871
Email: drjavedazher@gmail.com

ABSTRACT

Obstructive sleep apnea syndrome (OSA) is a serious condition characterized by disruption of normal sleep architecture by partial or complete obstruction of respiratory airflow that affects a substantial number of individuals. The on-going research in this field has improved our understanding of this disease, and a holistic management of the OSA patient is becoming widely accepted. It is imperative that the dental community continues to participate in the research and treatment of this serious and pervasive health problem. This case report describes a patient, who sought opinion for orthodontic treatment for correction of crowded dentition and gave a history of difficulty in breathing during the night. The comprehensive evaluation of this patient suggested that he was suffering from obstructive sleep apnoea.

Introduction

Sleep apnea is defined as a decrease in respiration, yielding to hypoxia and hypercapnia during sleep. Charles Dickens described Pickwickian syndrome in 1837 which had similar manifestations of a typical OSA patient. Sidney Burwell was the first to document a case of an OSA patient in 1956. American Academy of Sleep Medicine defined obstructive sleep apnoea (OSA) as 10 seconds of absent or decreased airflow causing episodic apneic or hypopneic events during sleep. Severity of OSA is determined by an apnea/hypopnea index (AHI), which measures the average number of these apneic events per hour.

It occurs in 2% of women and 4% of men and approximately 1 in 5 adults have at least mild OSAS and 1 in 15 adults have moderate or severe OSAS. It can be caused by factors which is either of neurologic origin or due to physical blockage of the airway. Hypertrophied adenoids, posteriorly positioned or retrognathic mandible, lower-positioned hyoid, a larger tongue or soft palate, a smaller pharynx, and shorter antero-posterior face length are suggested to be the contributing factors for OSA.[1]

It is associated with a number of adverse sequelae, both behavioral and physical. Behavioural consequences include excessive daytime sleepiness (EDS), impaired concentration, and neuropsychological dysfunction. Physical consequences include cardiovascular disorders, particularly hypertension, arrhythmias, atrial fibrillation, increased risk of myocardial infarction, cerebrovascular accidents, congestive heart failure, pulmonary hypertension, and neurological complications. The collapse and blockage of the airway leads to snoring, multiple arousals, sleep fragmentation and reperfusion injuries.[2]

A comprehensive evaluation of the patient should be done, including an accurate medical history, physical examination, airway analysis, and other additional aids like nasopharyngoscopy, lateral cephalometric radiography, fluoroscopy, magnetic resonance imaging (MRI), computed tomography (CT) and cone-beam computed tomography (CBCT) which helps in the preliminary diagnosis and a definitive diagnosis is made using polysomnography. [3,4]

The treatment modalities in sleep-breathing disorders aim to facilitate breathing and thereby reduce the risk of increased morbidity. The continuous positive airway pressure (CPAP) therapy for initial treatment is frequently advised in which patient wears an oxygen mask at night.[5] Mandibular repositioning devices like mandibular advancement devices (MAD), mandibular advancement repositioning splint (MARS) are being used with limited success.[6] The maxillary and mandibular expansion has also been found to be effective in the treatment of sleep apnea. The surgical options are considered when the nonsurgical therapies for OSA fail or are unacceptable to the patients. They range from soft tissue surgeries like uvulopalatopharyngoplasty (UPPP), genioglossus advancement (GGA), and hyoid suspension (HS) to osteotomy surgeries like inferior sagittal mandibular osteotomy and maxillomandibular osteotomy and advancement.[7,8]

Case Report

A male patient, 20 yrs of age reported with the chief complaint of irregularly placed teeth and mouth breathing in the night. He was suffering from cough since 1 year. He reported drooling of saliva while sleeping and often finds his pillow wet in the morning. He had a habit of sleeping on the stomach, frequent changing of postures while sleeping and somniloquy (sleep talking). He also complained of excessive day time sleepiness and his inability to concentrate on his studies.


Figure 1.


Figure2.

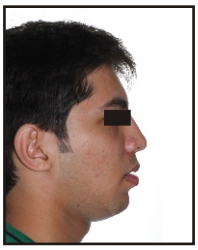
Figure 3.

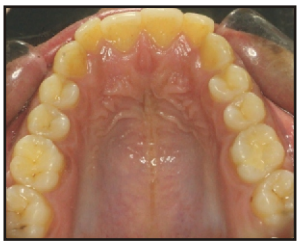
Figure 4.


Figure 5.


Figure 6.


Figure 7.


Figure 8.

Figure 1-8: Extra-oral and intra-oral photographs of the patient

Clinical examination revealed an athletic built, mesoprosopic face, convex facial profile, potentially competent lips, high clinical Frankfort mandibular plane angle (FMA) and a receding chin. He had Angle's class I malocclusion with upper and lower anterior crowding. His tonsils appeared normal and nasal septum was deviated towards right side.

Preliminary diagnostic test (butterfly test, mirror test, water holding test) revealed that the patient was a mouth breather. Cephalometric analysis revealed retrognathic mandible, posteriorly positioned mandible, reduced mandibular ramus length, increased mandibular plane angle, larger soft palate, constricted middle and inferior pharyngeal airway.[9,10] CT scan suggested reduced sagittal and lateral dimensions of pharyngeal airway and deviated nasal septum towards right side.

The patient was diagnosed with obstructive sleep apnoea based on the medical history, clinical and radiographic findings.

Management

The patient was advised to correct his sleep posture, preferably to sleep in the left lateral position and physiotherapy was advised to increase the tidal volume. ENT referral was done to treat the long standing cough and a diet control regimen was adapted to prevent frequent bouts of cold and cough. A non- extraction orthodontic treatment plan was designed to relieve upper and lower anterior crowding. Further, he was advised to undergo septal surgery to correct deviated nasal septum and pharyngoplasty for improving the pharyngeal volume.


Figure 9. Lateral cephalograph of the control


Figure 10. Lateral cephalograph of the patient

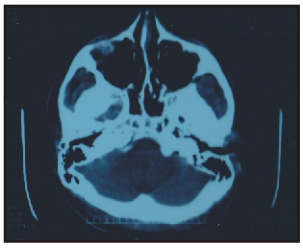
Figure 11. CT scan showing deviated nasal septum to the right side

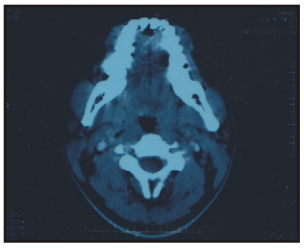
Figure 12 CT scan showing axial section of the pharyngeal airway

Tables

Table I: Cephalometric variables representing maxillo-mandibular morphology (in millimeters)

Variables	Control	Patient
SNA angle	85°	78°
SNB angle	77°	74°
ANB angle	8°	4°
Effective maxillary length	93	93
Effective mandibular length	117	127
Mandibular ramus length	54	49
Mandibular body length	73	74
Saddle angle	130°	129°
Mandibular plane angle	26°	41°

Table II: Cephalometric variables representing pharyngeal morphology (in millimeters)

Variables	Control	Patient
Soft palate length	36	41
Upper pharyngeal airway	13	14
Middle pharyngeal depth	23	18
Middle airway space	13	4
Middle soft tissue thickness	10	14
Inferior pharyngeal depth	20	17
Inferior airway space	12	7
Inferior soft tissue thickness	8	10
Lower pharyngeal airway	11	7

References

1. Young T, Skatrud J, Peppard PE. Risk factors for obstructive sleep apnea in adults. JAMA 2004;291:2013-6.
2. Chin K. Obstructive sleep apnea-hypopnea syndrome and cardiovascular diseases. J Intern Med 2004;43:527-8.
3. Woodson BT. Examination of upper airway, in Waite PD (ed): Oral and Maxillofacial Treatment of Obstructive Sleep Apnea. Oral Maxillofac Surg Clin North Am 1995;7:257-67.
4. Schwab RJ, Goldberg AN. Upper airway assessment: Radiographic and other imaging techniques. Otolaryngol Clin North Am 1998;31:931-68.
5. Wright J, Johns R, Watt I et al. Health effects of obstructive sleep apnoea and the effectiveness of continuous positive airway pressure: A systematic review of the research evidence. Br Med J 1997;314:851-60.
6. Hoffstein V. Review of oral appliances for treatment of sleep-disordered breathing. Sleep Breath 2007;11:1-22.
7. Davila DG. Medical considerations in surgery for sleep apnea, In Waite PD (ed). Oral and Maxillofacial Treatment of Obstructive Sleep Apnea. Oral Maxillofac Surg Clin North Am 1995;7:205-19.
8. Lye, KW and Deatherage, JR. Surgical Procedures for the Treatment of Obstructive Sleep Apnea. Semin Orthod 2009;15:94-8.
9. Saitoh K. Long-term changes in pharyngeal airway morphology after mandibular setback surgery. Am J Orthod Dentofacial Orthop 2004;125:556-61.
10. Pae EK, Lowe AA, Sasaki K et al. A cephalometric and electromyographic study of upper airway structures in the upright and supine positions. Am J Orthod Dentofacial Orthop 1994;106:52-9.

Source of Support: Nil. **Conflict of Interest:** None