Uvulopalatopharyngoplasty: A Surgical Treatment of Obstructive Sleep Apnoea (OSA)

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Snoring is now seen as one end of sleep-related breathing disorder resulting ultimately in obstructive sleep apnea. Uvulopalatopharyngoplasty (UPPP) is the first surgical procedure specifically designed to alleviate the abnormalities, although the use of laser appears to be the new trend. We present a case of Obstructive Sleep Apnoea (OSA) in an overweight young adult male which was corrected with the traditional UPPP. This paper also highlights the role of high index of suspicion and meticulous clinical decision making in the absence of sophisticated sleep studies.

Introduction

Obstructive sleep apnoea (OSA) is defined as the presence of 30 or more apnoeic episodes in a 7 hour of sleep or apnoeic index greater than 5 per hour, with persistent respiratory effort. Estimated prevalence rate is 2% in women and 4% in men in the U.S.A.

Snoring is the noise produced during sleep as a result of partial upper airways obstruction. It occurs in all age groups, but in general, 10% of men under the age of 30 years and 60% over 60 years snore. It is reported in 24% of men and 14% of women among Italians. OSA is reported in 0.3% of men in the 35 – 65 years age group in the U.S.A.

The aetiopathology of OSA is poorly understood. The peak of presentation in children is about the age of five years and this is attributed to lymphoid hyperplasia involving the Waldeyer’s ring. The documented risk factors for OSA are obesity with body weight greater than 15% of the ideal, male sex, craniofacial skeletal abnormalities and adenotonsillar hypertrophy. Moreover, alcohol and sedatives are known to aggravate OSA.

Therapy for snoring and obstructive sleep apnea can range from the simple and inexpensive life style changes, continuous positive airway pressure to surgery. Surgery is a last resort option when snoring and apnoeic attacks are particularly severe. Various procedures have been reported in the treatment of OSA. These include tonsillectomy, which is the commonest procedure. Others are adenoidectomy; advancement of the tongue or mandibular bones; surgical correction of septal deviation, turbinate hypertrophy or nasal polyps; somnoplasty, and life saving tracheostomy when other treatments have failed.

The multiplicity of these options may suggest that success is not full proof in many cases and this may be related to the aetiopathology being poorly understood. Uvulopalatopharyngoplasty (UPPP) as a surgical treatment of OSA is rarely indicated. It involves tonsillectomy, partial resection of the anterior and posterior faucial pillars, soft palate and uvula. It was done by dissection, which was the traditional method, although in recent times the use of laser (Laser assisted uvulopalatoplasty) is the trend. We present here the report of a 30-year-old man with OSA managed with UPPP by dissection in Nigeria.

Case Report

The patient was a 30-year-old unemployed Nigerian male with 9-years history of recurrent relapsing schizophrenia being managed in the psychiatric unit with anti-psychotic drugs including haloperidol, trifluoperazine and...
chlorpromazine. The psychiatrists admitted him 4 weeks earlier for treatment of an acute episode of schizophrenia and disturbed sleep pattern. He was then referred to the otorhinolaryngology unit for progressively worsening snoring, nasal obstruction and apnoeic attacks during sleep. The airway obstruction had become so severe within 2 weeks that the patient was dependent on oropharyngeal airway for most of the day and throughout the night (figure1). He was diagnosed with systemic hypertension 18 months before presentation and the blood pressure was controlled with oral Nifedipine and Moduretic.

Examination revealed an obese man in respiratory distress, sweating with noisy breathing that could be heard 20 metres from his bed. He was 1.9m in height and weighed 102kg with a body mass index (BMI) of 28.3kg/m$^2$.

Oral examination revealed an enlarged and elongated uvula, which flapped between the nasopharynx and oropharynx with respiratory efforts, moderately enlarged Tonsils and weak redundant soft palate and faucial pillars. Figure 1 shows Picture showing the patient in supine position with oropharyngeal airway insitu. Figure 2 shows Picture of the patient seen in the outpatient Clinic two weeks after surgery.

**Figure 1:** Picture showing the patient in supine position with oropharyngeal airway insitu.

![BEFORE UVULOPALATOPHARYNGOPLASTY](image1)

**Figure 2.**

![POST UVULOPALATOPHARYNGOPLASTY](image2)
Pre-operative Chest and neck radiographs, the electrocardiogram and full blood counts (FBC) were normal. The patient was prepared for UPPP with adequate counseling and consent for a tracheostomy if necessary. The anti hypertensive drugs and trifluperazine were continued till the day of surgery. No premedication drug was administered. He was transported to the operating theatre in a semi-recumbent position. Preparations made for difficult airway management included availability of different sizes of endotracheal tubes, bougies, long blade laryngoscopes and a tracheostomy set.

Following administration of 0.6mg of Atropine, anaesthesia was induced using the inhalational technique with 50% oxygen (O\textsubscript{2}) in nitrous oxide (N\textsubscript{2}O) and incremental concentrations of halothane. Ventilation was manually checked and found adequate with no airway obstruction. Then the anaesthesia was deepened with intravenous Thiopentone 200mg and suxamethonium 150mg was administered to aid endotracheal intubation. The airway was secured with an 8.0mm orotracheal tube and the patient was manually ventilated via a Bain circuit with a gas flow rate of 8L/min. The anaesthesia was maintained with 1-2% Isoflurane and 50% O\textsubscript{2} in N\textsubscript{2}O. Muscle relaxation was maintained with Pancuronium 7mg and pentazocine 60mg was administered for analgesia. Intraoperative monitoring included non-invasive blood pressure measurement, ECG and O\textsubscript{2} saturation.

Examination under anaesthesia (EUA) of the nose, nasopharynx and direct Laryngoscopy showed no narrowing or mass lesion in the nose and larynx. Examination of the preoperative oropharynx confirmed the oral findings above. The site of obstruction was thus confirmed clinically to be the oropharynx and the pathology was velopharyngeal incompetence. He had UPPP i.e. tonsillectomy, partial resection of the anterior posterior faucial pillars, soft palate and uvula. The upper parts of the anterior and posterior faucial pillars were repaired on each side.

Post operatively, the patient was able was able to breathe without the use of the oropharyngeal airway (Figure2). There was significant improvement of the snoring and complete cessation of the apnoeic episodes. He was discharged home for outpatient follow up on the 7\textsuperscript{th} postoperative day.

**Discussion**

In our patient, velopharyngeal incompetence (VPI) was the main cause of snoring, while another contributing factor was the overweight (BMI=28.3). In VPI, obstruction occurs when the increased negative intraluminal pressure is greater than the ability of the dilator to hold the pharynx open\textsuperscript{2}. The resultant prolonged hypoxia and frequent arousal from sleep may present with multiple clinical problems such as systemic hypertension and social embarrassment as presented in this patient. Other problems are marital problems, impotence, daytime hypersomnolence, road traffic accident and cardiac arrhythmias\textsuperscript{2,8}.

UPPP as a surgical treatment for OSA was first reported by Ikematsu and later modified and popularized by Fugital\textsuperscript{2}. The goal of the surgery is to increase the cross sectional area of the velopharynx thus decreasing the airway resistance, eliminating the turbulent airflow and vibration responsible for collapse of the pharynx and snoring. The perioperative management of such patients should involve a high degree of clinical suspicion, control of airway throughout, judicious use of medications and appropriate monitoring\textsuperscript{10}.

UPPP is not a widely practiced surgical option in the management of OSA because of its limited effectiveness and the multi-factorial cause of OSA. Predicting which patient will benefit from it is often difficult\textsuperscript{13}. Identification of the level of obstruction is crucial to the outcome of the surgery; this often needs a sleep endoscopy study or a polysomnography\textsuperscript{11} which was not done in this patient because it was not available in our hospital. We accept this as a drawback in the diagnosis of this case.

In spite of this, our clinical assessment was strongly suggestive of velopharyngeal incompetence, hence the indication for surgery. Conservative management was not considered because of the severity of snoring and airway obstruction which was confirmed by the far distance from which the snoring could be heard as well as dependence on oropharyngeal airway two weeks prior to surgery. Additional reasons are co-morbidity factors such as poor mental health, possibility of non-compliance, particularly as the patient was on anti-psychotic drugs to control the
schizophrenia. Although there was pain postoperatively, other complications namely Velopharyngeal incompetence and hypernasal speech were not seen in the patient; however the patient is still being followed up.

The cessation of apnoea, independence of oropharyngeal airway and remarkable improvement in snoring postoperatively were the indices of the successful outcome of surgery (Figure 2). The reported success rate of UPPP in curing snoring is 80 – 90% and 50 – 60% for OSA.

In conclusion, UPPP as a surgical option for the treatment of OSA has been beneficial for our patient. Therefore, it remains a useful therapeutic option for patients with OSA, who satisfy the criteria.

References