

CASE REPORT

A Rare Case of Secondary Obstructive Sleep Apnea Syndrome

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ABSTRACT

Obstructive sleep apnea (OSA) is a condition that is frequently encountered by pulmonary specialists both in children and adults due to the strong correlation with various factors, such as obesity, COPD, and craniofacial abnormality. A decrease in tone in the upper airway muscles during sleep and anatomic abnormalities like narrowing of the upper airway can lead to OSA. The upper airway abnormalities whether congenital or acquired can increase the risk of OSA. Though common surgical cases in otorhinolaryngologist clinics, such cases are rare in a pulmonologist practice. We hereby report a rare case of tracheal stenosis status post-cricotracheal resection anastomosis with delayed surgical site web formation resulting in secondary OSAS. A 36-year-old man with a history of Guillain–Barre syndrome (GBS) had received prolonged mechanical ventilation due to GBS disease complications and developed tracheal stenosis. It was managed with partial cricotracheal resection anastomosis. Later after 5 years of correction surgery, he presented with snoring and dyspnea on exertion. He had gained weight and his surgical site showed a web formation. Both factors narrowed the previously patent upper airway. Polysomnography demonstrated mild OSA. The patient was kept under observation and managed conservatively. A high clinical index of suspicion and awareness of the existence of delayed post-surgical sequelae in surgeries involving the trachea is essential for the diagnosis.

Keywords: Case report, Obstructive sleep apnea, Polysomnography, Tracheal stenosis.

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INTRODUCTION

Obstructive sleep apnea syndrome (OSAS) is multifactorial in etiology. Obesity and certain medical comorbidities, such as metabolic syndrome, hypertension, and diabetes mellitus are commonly associated with OSAS. Anatomical upper airway abnormalities commonly cause pediatric OSAS. Anatomic abnormalities lead to a reduction in the diameter of the upper airway and a decrease in tone in the upper airway muscles during sleep. Cartilaginous rings of trachea prevent airway collapse from gravity and inspiratory airway pressure. Surgery involving the trachea can lead to a decrease in the tone of airway muscle and reduce the rigid support of trachea which may result in airway collapse.¹ Also, a surgical site is predisposed to scar tissue formation. We hereby present a rare case of obstructive sleep apnea (OSA) secondary to and presenting after many years of corrective tracheal surgery.

CASE DESCRIPTION

A 36-year-old man was referred to the pulmonology clinic with complaints of snoring and dyspnea on exertion modified medical research council (MMRC) grade I for II years. He had a history of hospital admission in 2015, wherein he was intubated and received mechanical ventilation for 20 days due to complications of GBS. One year later, he developed noisy breathing. He visited the otorhinolaryngology department. He was exhaustively evaluated then with computed tomography of the neck which was suggestive of abrupt narrowing of the trachea at the level of cricoid cartilage. The 70° scopy diagnosed tracheal stenosis. He underwent partial cricotracheal resection anastomosis surgery in 2016. The patient followed up regularly with the otorhinolaryngology surgeons but was lost to follow-up in the covid pandemic. There was no history of diabetes mellitus, hypertension, or hypothyroidism. Recently, in 2022, he again presented with snoring and dyspnea to the ear-nose-throat (ENT) outpatient clinic. He was admitted

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and evaluated by the ENT team. He underwent a laryngoscopy which was suggestive of web formation at the anastomosis site (Fig. 1). He was referred to our pulmonology team for evaluation of dyspnea and snoring. He was vitally stable. He was overweight with a current BMI of 27.7 kg/m². STOPBANG score was 5 suggestive of high risk of OSA. The chest radiograph was normal. Spirometry was suggestive of obstructive abnormality with FEV1/FVC ratio of 52 with FEV1 1.81 liter (49% predicted) with 30 mL and 2% post-bronchodilator reversibility. Forced vital capacity was 3.46 liter (80% predicted). The flow volume loop was suggestive of fixed upper airway obstruction (Fig. 2). Empeys index was 12 suggestive of upper airway obstruction. FEF50/FIF50 was 0.73 was normal. He underwent an overnight polysomnography which was suggestive of mild OSA with apnea–hypopnea index (AHI) 11.4/hour, oxygen desaturation index (ODI) of 8.8/hour, and average saturation of 95%. Thus, he was diagnosed with a case of mild OSAS secondary

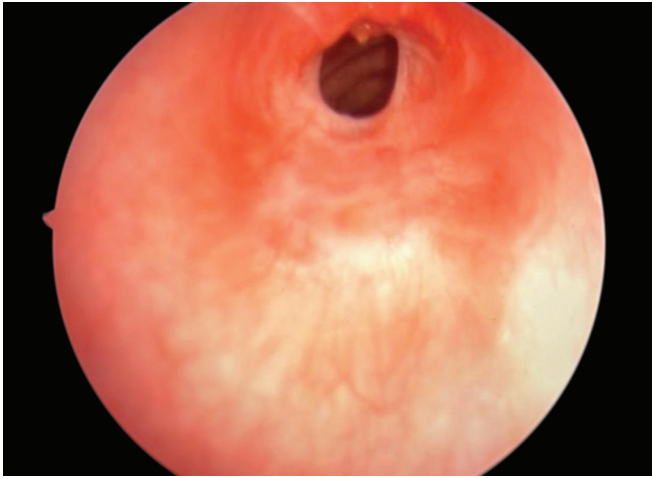


Fig. 1: Laryngoscopy image suggestive of web formation at the subglottic anastomosis site

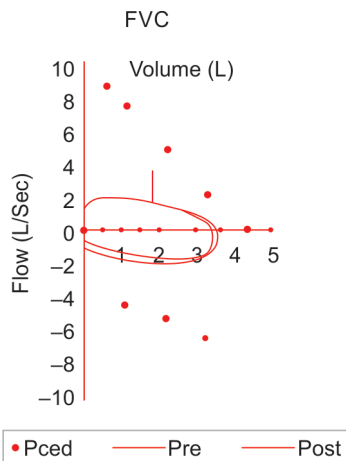


Fig. 2: Flow volume loop showing a fixed upper airway obstruction

to fixed upper airway obstruction due to a rare delayed sequelae of tracheal web formation at the cricotracheal surgery anastomosis site. He was advised lifestyle modifications for OSAS, that is, sleep hygiene, weight reduction diet, exercise, and regular follow-up. Management was conservative with regular follow-up from the otolaryngology aspects.

DISCUSSION

Obstructive sleep apnea syndrome is a common problem presenting to the pulmonologist outpatient clinic. Medical comorbidities, such as metabolic syndrome, hypertension, diabetes mellitus, hypothyroidism, and chronic kidney disease are commonly associated with OSAS. Anatomical upper airway abnormalities

commonly cause pediatric OSAS. Anatomic abnormalities lead to a reduction in the diameter of the upper airway and a decrease in tone in the upper airway muscles during sleep. Cartilaginous rings of the trachea prevent airway collapse from gravity and inspiratory airway pressure. Surgery involving the trachea can lead to a decrease in the tone of airway muscle and reduce the rigid support of trachea which may result in airway collapse. Such cases are rare and even rarer as delayed sequelae of surgeries of the upper airway.^{2,3}

Our patient presented with complaints of snoring for 2 years along with grade I dyspnea on exertion. Clinically, our patient was evaluated and a pulmonary function test was done suggestive of fixed upper airway obstruction. In cases of UAO, the collapse of the upper airway reduces the airway intraluminal diameter and increases airway resistance, leading to the apneas and hypopneas that characterize OSA.^{4,5} The cartilaginous rings of the trachea prevent the airway from collapsing during sleep.² Granular tissue, stenosis, fibrosis, dehiscence, malacia, hemorrhage, and fistulas have been described as complications at the surgical site following tracheal surgery.³ These are present usually in the immediate convalescent period post-surgery. In our patient, surgical intervention for tracheal stenosis might have resulted in loss of tone of upper airway muscle, decrease in rigid support of tracheal rings and the collapsing effect of both gravity and negative inspiratory pressure must have contributed to UAO. However, this was subclinical in the immediate surgical convalescence stage. He gained weight over the 6 years following surgery due to a sedentary lifestyle which additionally added to the risk for the development of OSAS. As the polysomnography was suggestive of mild OSA, he was treated with conservative management.

Our case report highlights the fact that OSAS secondary to UAO can be observed as a delayed sequelae of correction surgery of the trachea when associated with other medical factors like obesity.

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REFERENCES

1. Kanter RK, Pollack MM, Wright WW, et al. Treatment of severe tracheobronchomalacia with continuous positive airway pressure (CPAP). *Anesthesiology* 1982;57:54–56. DOI: 10.1097/00000542-198207000-00017.
2. Sanna A, Fargnoli R, Camiciottoli G. Obstructive sleep apnea syndrome as a complication after tracheal surgery. *J Clin Sleep Med* 2006;2(4):458–459. PMID: 17557477.
3. Pinsonneault C, Fortier J, Donati F. Tracheal resection and reconstruction. *Can J Anaesth* 1999;46:439–455. DOI: 10.1007/BF03012943.
4. Hugel DW. Variable site of airway narrowing among obstructive sleep apnea patients. *J Appl Physiol* 1986;61(4):1403–1409. DOI: 10.1152/jappl.1986.61.4.1403.
5. Suratt PM, McTier RF, Findley LJ, et al. Changes in breathing and the pharynx after weight loss in obstructive sleep apnea. *Chest* 1987;92(4):631–637. DOI: 10.1378/chest.92.4.631.