

Treatment of OSA in a patient with acquired laryngomalacia

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Background: Laryngomalacia is the collapse of supraglottic structures during inspiratory, resulted in intermittent airflow limitation or stridor. It is the most common cause of stridor in neonates, infants and children. Many studies described obstructive sleep apnea (OSA) symptoms in congenital laryngomalacia, an entity characterized by inspiratory stridor due to flaccid epiglottis, redundant aryepiglottic folds, or hypotonia of the larynx. Even though laryngomalacia is a common cause of OSA in pediatric group, it is quite rare in adults. In this case, we demonstrated a case of acquired laryngomalacia with OSA to discuss sleep abnormalities and treatments in acquired laryngomalacia-related sleep disturbance.

Case report: A 52-year-old male, body mass index (BMI) of 28.2 kg/m², complained of gastroesophageal reflux, intermittent dyspnea, and gasping sensation during both day and night for several years. He visited Otolaryngologist and was found having laryngomalacia with bilateral redundant arytenoid fold by fiberoptic laryngoscopy in 2011. Besides, excessive daytime sleepiness was noted. Polysomnography (PSG) and continuous positive airway pressure (CPAP) titration were performed in local medical department where severe obstructive sleep apnea (apnea-hypnea index, AHI: 53.9/hr) was diagnosed. The patient received three times of CO₂ laser excision to the redundant arytenoid processes in the following two years. Due to the intolerance of CPAP, he didn't receive CPAP before or after the surgeries. Dyspnea and gasping sensation still occurred episodically during those 2 years. One episode of upper airway obstruction, laryngeal edema, related hypercapnic respiratory failure was noted few months after the last surgery. The patient was intubated and admitted to the intensive care unit. After successfully extubated, PSG and PAP titration were performed by our hospital again. Worsening OSA (AHI: 72.3/hr) that required BIPAP treatment was noted. After treating with BIPAP for two years, the severity of OSA (AHI: 72.3/hr→32.8/hr) decreased. The nocturnal oxygenation (Lowest SpO₂: 65%→86%) also improved during PSG follow ups. Moreover, the dyspnea sensation, symptoms of GERD, and gasping sensation all subsided after PAP therapy.

Discussion: Recent studies indicated that acquired laryngomalacia, which might be caused by neuromuscular disorders or allergic factors, was related to OSA. Laryngeal edema is a complication in both laryngomalacia and surgery-treated laryngomalacia. Untreated laryngeal edema may increase the severity of OSA and induce respiratory failures. Recent studies also indicated that optimal PAP device decrease respiratory effort of patients with congenital upper airway obstruction related OSA. Furthermore, BIPAP may improve the synchrony of respiration. However, the side effect of PAP therapy such as aerophagia and choking sensation should be noted in laryngomalacia patients.

Conclusion: Optimal PAP device is essential for patients with laryngomalacia-related OSA. Synchronized PAP treatment may improve OSA and symptoms such as GERD and laryngeal edema and further increase the sleep quality.

中文題目：一位後天性喉頭軟化症病患之阻塞性睡眠呼吸中止症之治療經驗

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