

Case Report

Obstructive Sleep Apnea in Heart Failure with Nearly Complete Resolution after Implantation of a Left Ventricular Assist Device

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Abstract

Sleep apnea syndrome is common in chronic heart failure and associated with a higher mortality and morbidity. Both central and obstructive sleep apnea can occur in these patients. In general, an obstructive sleep apnea (OSA) is regarded as a cause for heart failure, whereas heart failure induces a central sleep apnea (CSA).

However, we describe a patient with chronic heart failure and mainly an obstructive sleep apnea who had near resolution of his apnea syndrome after implantation of a left ventricular assist device (LVAD).

Abbreviations: OSA: Obstructive Sleep Apnea; CSA: Central Sleep Apnea; LVAD: Left Ventricular Assist Device; CPAP: Continuous Positive Airway Pressure

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Introduction

Sleep apnea syndrome is common in patients with chronic heart failure, with prevalence from 40 to 76%¹. Both central and obstructive sleep apnea can occur and may lead to hypertension, heart failure, coronary artery disease and stroke¹⁻⁴. Causes for these cardiovascular sequelae are increased sympathetic activity, increased negative thoracic pressure, systemic inflammation and release of vasoactive substances, leading to endothelial dysfunction^{2,3}.

We describe a patient with chronic heart failure and mainly obstructive sleep apneas who had near resolution of his apnea syndrome after implantation of a left ventricular assist device (LVAD).

Case report

A 68-year-old male, with a hereditary dilated cardiomyopathy, implantable cardioverter-defibrillator and atrial fibrillation, noticed apneas during the night. These apneas occurred both in supine and non-supine position. The Epworth sleepiness score was 2.

At the time of evaluation he also complained of fatigue and breathlessness on exertion (NYHA Class III). Physical examination revealed stable vital signs (blood pressure 110/80, pulse 70/min), an enlarged liver and a systolic cardiac murmur at the cardiac apex (2/6). Body-mass-index was 26 kg/m². The

chest X-ray showed an enlarged heart without radiologic signs of fluid overload. Echocardiography findings consisted of left ventricular dilation with severe left ventricular dysfunction (ejection fraction 20%) and mild mitral valve regurgitation, dilated right ventricle with moderate right ventricular function and severe tricuspid valve regurgitation. Spirometry was normal. Polysomnography showed an apnea-hypopnea index of 44.3/hour with 19% hypopnea and 81% mainly obstructive apneas (see Figure 1). A transcutaneous nocturnal oxygen desaturation measurement showed a mean saturation of 91.5% (lowest of 73%). Continuous positive airway pressure (CPAP) was started. Due to progressive heart failure, an LVAD was implanted 4 months later. This went uneventful and his hemodynamic situation improved considerably. During a follow up visit 2 months later, he reported that he no longer suffered from apneas and had stopped using his CPAP.

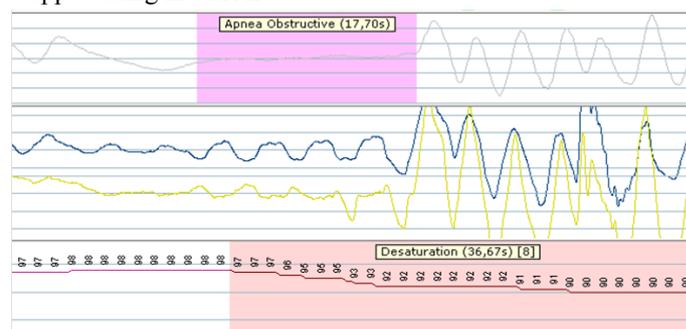


Figure 1: Polysomnographic recordings before LVAD implantation. It shows the presence of obstructive sleep apnea with cessation of air flow (upper panel) in association with slightly movement of the thorax and abdomen (middle panel),

these patients.

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