

Obstructive Sleep Apnea and a Maxillomandibular Advancement: Does Maxillomandibular Advancement have more success than nonsurgical treatment in decreasing OSA?

David Mann, Allen Fred Fielding *

Fourth Year PGY in Oral and Maxillofacial Surgery

*Corresponding Author: Allen Fred Fielding, Fourth Year PGY in Oral and Maxillofacial Surgery.

Received date: **November 25, 2024**; Accepted date: **December 04, 2024**; Published date: **December 31, 2024**

Citation: David Mann, Allen Fred Fielding, (2024), Obstructive Sleep Apnea and a Maxillomandibular Advancement: Does Maxillomandibular Advancement have more success than nonsurgical treatment in decreasing OSA? *J Clinical Research and Reports*, 17(4); DOI:10.31579/2690-1919/442

Copyright: © 2024, Allen Fred Fielding. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Introduction: Takotsubo syndrome (TTS) is a cardiomyopathy triggered by emotional or physical stress. This case report presents a unique instance of TTS associated with myasthenia gravis (MG) in which myasthenic crisis developed after TTS diagnosis and not before.

Case Description: A 73-year-old man presented with difficulty swallowing, dysphonia, and dyspnea, showing moderate-severe left ventricular dysfunction. Blood tests revealed elevated troponin and BNP levels, while the ECG at the arrival showed an ST-elevation in anterior leads. Coronary angiography showed normal aspect of coronary vessels. Echocardiography confirmed TTS with apical ballooning.

After few days, myasthenic symptoms emerged leading to a myasthenic crisis. The patient improved with acetylcholinesterase inhibitors and was discharged with pyridostigmine and prednisone. Follow-up revealed complete resolution of left ventricular dysfunction.

Discussion: MG rarely affects the heart, but in this case, it led to TTS. Notably, TTS occurred before the myasthenic crisis, emphasizing the need for cardiac monitoring in patients with new neurological diagnoses and acute respiratory.

Keywords: takotsubo; myasthenia gravis; myasthenic crisis

Introduction

Obstructive sleep apnea is a burdensome condition that is plaguing the United States healthcare system. The condition is linked to many comorbidities including heart failure and increased risk of stroke. One of the major comorbidities that exacerbate the development of OSA is obesity. Treatment for OSA can consist of two modalities of therapy, nonsurgical and surgical. Nonsurgical therapy consists of continuous positive airway pressure machines and occlusal appliances. Nasal continuous positive airway pressure of nCPAP is considered to be first-line treatment of OSA. However, many patients are noncompliant with CPAP therapy or an occlusal appliance due to the discomfort of wearing the equipment at night and difficulties actually falling asleep while wearing the equipment. Those that fail or cannot tolerate nonsurgical therapy have the option of following through with surgical therapy. Surgical therapy can include maxillomandibular advancement, advancement genioplasty, DISE, uvulopalatopharyngoplasty, or tracheotomy as a last resort. However, in patients with severe dentofacial

deformity and occlusion, generally maxillomandibular advancement can alleviate the patient's malocclusion as well as increase the pharyngeal airway space. However, in a patient with class III malocclusion, a bimaxillary jaw surgery is generally required, leading to maxillary advancement and mandibular setback. It has been shown that mandibular setback leads to decreased pharyngeal airway space and that a mandibular advancement could lead to an increased pharyngeal airway space. As more research has been produced, the goal of this literature is to determine the success of maxillomandibular advancement surgery or if the procedure has led to more episodes of OSA.

Materials and Methods:

A literature review was conducted utilizing Pubmed and a PICO search criteria. The question used for PICO was the following, "In Patients with Obstructive sleep apnea and dentofacial deformities does maxillomandibular advancement vs nonsurgical intervention lead to a

decrease in OSA. Mesh terms and keywords were used to develop a search string. The search string developed can be seen in Figure 1.

Results:

Using the search string mentioned in Figure 1 led to x different results. Of the x different results, only articles with the highest strength of evidence were used. This included systematic reviews and meta analyses. The first article used was Primary and Secondary Telegnathic Maxillomandibular Advancement, With or Without Adjunctive Procedures, for Obstructive Sleep Apnea in Adults: A Literature Review and Treatment Recommendations by Jeffrey Prinsell DMD MD out of the Journal of Oral and Maxillofacial Surgery. The second article used was Is maxillomandibular advancement an effective treatment for obstructive sleep apnea? Systematic literature review and meta-analysis from Paulo Alceu Kiemle Trindade et al from the Brazilian Journal of Otorhinolaryngology. The third article used was Maxillomandibular advancement is a successful treatment for obstructive sleep apnoea: a systematic review and meta-analysis from C.R. John et. al from the International Journal of Oral and Maxillofacial Surgery.

Discussion:

When comparing all three systematic reviews and meta-analyses, each came to a similar conclusion, maxillomandibular advancement is an effective treatment method of obstructive sleep apnea. Measurement of success was based on mean percent reduction in apnea hypnoea index. The third study went as far to measure respiratory disturbance index (RID), Epworth Sleepiness Scale (ESS), lowest oxygen saturation (LSAT), and body mass index (BMI) as other measurements to effectiveness of MMA.

In the first study, Prinsell evaluated the extrapharyngeal procedures with maxillomandibular advancement, maxillomandibular advancement, primary maxillomandibular advancement with intrapharyngeal procedures and non-MMA multilevel surgery, uvulopalatopharyngoplasty and nCPAP. Intrapharyngeal procedures like UPP, tonsillectomy, had the potential issue of producing life-threatening upper airway edema. Extrapharyngeal procedures included those that worked on lower facial skeleton structures like maxilla, mandible and hyoid bones. Prinsell referred to MMA as telegnathic maxillomandibular advancement in which surgery advances the anterior pharyngeal tissues attached to maxilla, mandible, and hyoid bones thus increasing the posterior airway space.

In the first study, Prinsell evaluated case series and distinguished four separate categories in which to evaluate MMA: primary MMA, primary MMA with extrapharyngeal procedures, primary MMA with intrapharyngeal procedures, and secondary MMA. Of those, he evaluated

fifteen case series which included a total of 391 cases of cases therapeutic success, which was defined as AHI<20.

Prinsell evaluated patients that had primary MMA (MMA alone, MMA with extrapharyngeal procedures, or MMA with intrapharyngeal procedures) vs. secondary MMA (MMA after having extrapharyngeal or intrapharyngeal adjunctive procedures in a prior surgery following a multi-step protocol). He noted that patients that obtained primary MMA (232 patients) had a mean reduction of AHI by 86.5%. Patients that obtained secondary MMA had a mean reduction of AHI by 86.6%, it was also noted that patient's had significant improvement in mean PSG parameters of AHI, lowest arterial oxyhemoglobin saturationns (LSAT) number of desaturations <90%, percent sleep efficiency, percent stage 3+4 sleep, and percent rapid eye movement sleep. Prinsell found that therapeutic efficacy of MMA was generally lower in cases that used concomitant adjunctive intrapharyngeal procedures versus extrapharyngeal procedures as the percentage of success ranged from 57% to 87% with intrapharyngeal procedures and 100% success with extrapharyngeal procedures. However, this was his own procedures that he reported having complete success. He then looked at MMA versus CPAP, which found that patients had an 89.8% reduction with nCPAP versus 89.5% mean percent reduction after MMA versus 92.1% after primary MMA with extrapharyngeal procedures. MMA and nCPAP showed similar marked improvements in daytime vigilance tests as objective measures of daytime hypersomnolence and cognitive performance. Prinsell continued to summarize the case series he used in his systematic review reporting that mean percentage reduction in AHI by nCPAP was 89.8%, 92.1% for primary MMA with extrapharyngeal procedures, 88.4% for primary MMA, 86.6% for secondary MMA, 79.4% for primary MMA with intrapharyngeal procedures, 53% for non-MMA multilevel surgery, 31.3% for UPPP. From these studies, it is indicated that MMA with extrapharyngeal procedures provides a 2.3% more in reduction of AHI vs. nCPAP.

In the second study, In the third study,

Conclusion:

Patients with OSA and dentofacial deformities that have failed nonsurgical interventions are recommended to undergo surgical intervention to correct their skeletal patterns and decreased airway space. However, in patients who would require mandibular setback surgery resulting in decreased the airway space in a patient that already has OSA, it is noted that these patients o not have further obstructive sleep apnea. In fact, because these patients often receive maxillary advancement along with their mandibular setback, it changes the airway space to decrease the amount of OSA these patients encounter.



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here: [Submit Manuscript](#)

DOI:[10.31579/2690-1919/442](https://doi.org/10.31579/2690-1919/442)

Ready to submit your research? Choose Auctores and benefit from:

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more <https://www.auctoresonline.org/journals/journal-of-clinical-research-and-reports>