

## Case Report

# Allergic contact dermatitis due to use of a continuous positive airway pressure mask - A rare case report

Syed Yousuf Ali\* and Aishwarya Reddy N

*Department of Dermatology and STD, Shadan Institute of Medical Sciences, Peerancheru, Hyderabad-08, Andhra Pradesh, India.*

### \*Correspondence Info:

Dr. Syed Yousuf Ali  
Associate Professor,  
Department of Dermatology and STD,  
Shadan Institute of Medical Sciences, Peerancheru, Hyderabad-08, Andhra Pradesh, India  
E-mail: [syedbidar@gmail.com](mailto:syedbidar@gmail.com)

### Abstract

Nasal continuous positive airway pressure (CPAP) is commonly used to treat various respiratory conditions including obstructive sleep apnea (OSA). It is now the treatment of choice for patients with sleep apnea syndrome (SAS). Several side effects related to the use of nasal CPAP are described in the literature. Mask interface related issues can be an important determinant of adherence to continuous positive airway pressure (CPAP) therapy and the side effects can cause patients to discontinue this effective therapy. We report a case of 72 year old man who used nasal CPAP for 6 months for the treatment of OSA and developed allergic contact dermatitis (ACD) from a CPAP nasal mask.

**Keywords:** ACD, CPAP, Silicone

## 1. Introduction

TAPVC The sleep apnea/ hypopnea syndrome (SAHS) occurs in 2 to 4% of the middle aged population<sup>1</sup> causing impaired daytime functioning as a result of excessive daytime somnolence, cognitive impairment and altered mood<sup>2,3</sup>. The consequences of such impairments are of major concern when they lead to accidents on the road<sup>4,5</sup> and at work. There is also increasing evidence that SAHS is an independent risk factor for cardiovascular disease<sup>6</sup>. Effective treatment for SAHS can be achieved by nasal continuous positive airway pressure (CPAP). CPAP therapy is the treatment of choice for most patients; however, effectiveness continues only while the treatment is being used<sup>7</sup>.

Several forms of CPAP are used in OSA with nasal CPAP being the most effective and most commonly used therapy<sup>8</sup>. CPAP is the treatment of choice for people who have sleep apnea and coronary artery disease (CAD) or heart failure<sup>9</sup>.

Allergic contact dermatitis (ACD) is the inflammation of skin induced by contact with specific allergen and is typically manifested by erythema, mild edema, and scaling. We report a case of ACD due to nasal mask in our patient.

## 2. Case Report

A 72 year old male patient presented to the Outpatient with complaints of itchy skin lesions over the nose since 1 week. The patient is a known case of sleep apnea and has been prescribed CPAP made of silicone material (figure 1). The patient has been using the CPAP device for 6 months. Clinical examination revealed eroded crusted plaque with few pustule and site of the lesions corresponds to the site of contact of the CPAP device (figure 2). The patient tried antihistamines which provided mild relief. He tried weaning from the device which gave better relief. Although he found his symptoms recurred on reusing the device. With this background clinical diagnosis of Allergic Contact dermatitis with CPAP is made.

**Figure 1: Patient with CPAP**



**Figure 2: Allergic contact dermatitis due to CPAP**



### 3. Discussion

The sleep apnea/hypopnea syndrome (SAHS) occurs in 2 to 4% of the middle aged population<sup>1</sup> causing impaired daytime functioning as a result of excessive daytime somnolence, cognitive impairment and altered mood<sup>2,3</sup>. The consequences of such impairments are of major concern when they lead to accidents on the road<sup>4,5</sup> and at work. There is also increasing evidence that SAHS is an independent risk factor for cardiovascular disease<sup>6</sup>. Effective treatment for SAHS can be achieved by nasal continuous positive airway pressure (CPAP). CPAP therapy is the treatment of choice for most patients; however, effectiveness continues only while the treatment is being used<sup>7</sup>. As SAHS is usually a lifelong condition<sup>10</sup>, it is extremely important to ensure long-term use of CPAP therapy.

Early studies reported high rates of long-term use<sup>11-14</sup>; however, most relied on questionnaire and self-reported use rates. Subsequent studies, using data recorded from time clocks built into the CPAP machines, have shown that early figures were overestimates and that objective use is lower<sup>15,16</sup>, often irregular, and rarely meets the prescribed level<sup>17,18</sup>. There are few studies of objective long-term use of CPAP; only one<sup>19</sup> could be found involving more than 50 patients with a mean follow-up time of more than 1 yr.

A CPAP device is used to treat individuals with a pulmonary disease such as OSA. Several forms of CPAP are used in OSA with nasal CPAP being the most effective and most commonly used therapy<sup>8</sup>. CPAP is the treatment of choice for people who have sleep apnea and coronary artery disease (CAD) or heart failure<sup>9</sup>. Research shows that continuous positive airway pressure (CPAP) decreases daytime sleepiness, especially in those who have moderate to severe sleep apnea<sup>20,21</sup>.

In people who have moderate to severe sleep apnea, nasal continuous positive airway pressure (NCPAP) also lowers blood pressure during both the day and the night<sup>22,24</sup>. CPAP is better than other non-surgical methods for treating obstructive sleep apnea<sup>25</sup>. People with coronary artery disease who use CPAP for sleep apnea are less likely to have heart problems such as heart failure<sup>26</sup>.

There are also several Side effects of nasal CPAP which are found in different studies. Pépin *et al*<sup>27</sup> in a study of 193 patients reported Rhinorrhea (35%), xerostomia (65%), nasal congestion (25%); more individuals had reactions to the silicone mask vs the individually molded mask (13% vs 5%). Jones *et al*<sup>28</sup> in a study of 66 patients found broken skin or open sores (17%), persistent erythema or painful areas (38%). Smurthwaite and Ford<sup>29</sup> in a patient found Extensive facial necrosis of the bridge of the nose. Yong *et al*<sup>30</sup> in a study of 41 patients found Nasal septum breakdown (29%). Scalf and Fowler<sup>31</sup> in a patient found Allergic contact dermatitis involving the scalp which was caused by the neoprene rubber strap used to secure the CPAP nasal mask in place.

There is no record of a similar report of ACD with CPAP till date. Only 2 cases of ICD have been reported in literature due to CPAP, one is a 64year old man who developed pruritic facial rash in skin underlying his nasal mask and another is 58year old lady who had developed erythema and rash around her nose and paranasal area since initiating use of her nasal CPAP mask. We report a case of ACD due to nasal mask in our patient and having excluded other possible etiological factors for rash in this specific area in our patient we come to a conclusion that it is due to CPAP nasal mask.

Thus Continuous positive airway pressure nasal masks can be associated with a number of side effects including ACD, as demonstrated in our patient. A diagnosis of ACD should be considered in patients who present with an unusual pattern of dermatitis on the central face in the underlying area of a CPAP nasal mask.

### References

- Young T., Palta M., Dempsey J., Skatrud J., Weber S., Badr S. The occurrence of sleep-disordered breathing among middle-aged adults. *N. Engl. J. Med.* 1993; 328:1230-1235.
- Cheshire K., Engleman H. M., Deary I. J., Shapiro C., Douglas N. J. Factors impairing daytime performance in patients with sleep apnea/hypopnea syndrome. *Arch. Intern. Med.* 1992; 152:538-541.
- Guilleminault, C. J. Van Der Hoed, and M. M. Mitler. Clinical overview of the sleep apnea syndromes. *Sleep apnea syndromes* 1978: 1-12.
- Findley L. J., Unverzagt M. E., Suratt P. M. Automobile accidents involving patients with obstructive sleep apnea. *Am. Rev. Respir. Dis.* 1988; 138:337-340.
- George C. F., Nickerson P. W., Hanly P. J., Millar T. W., Kryger M. H. Sleep apnea patients have more automobile accidents. *Lancet* 1987; 2:447.
- Young T., Peppard R., Palta M., Hla K. M., Finn L., Morgan B., Skatrud J. Population-based study of sleep-disordered breathing as a risk factor for hypertension. *Arch. Intern. Med.* 1997; 157:1746-1752.
- Sullivan, C. E., and F. G. Issa. Obstructive sleep apnea. *In Clinics in Chest Medicine* 1985: 633-650.
- Qureshi A, Ballard RD. Obstructive sleep apnea. *J Allergy Clin Immunol.* 2003; 112:643-651.
- Silverberg DS, *et al.* Treating obstructive sleep apnea improves essential hypertension and quality of life. *American Family Physician* 2002; 65(2): 229-236.
- Guilleminault C., Blair F., Simmons, Motta J., Cumminskey J., Rosekind M., Schroeder J. S., Dement W. C. Obstructive sleep apnea syndrome and tracheostomy: long-term follow-up experience. *Arch. Intern. Med.* 1981; 141:985-988.
- Sanders M. H., Gruendl C. A., Rogers R. M. Patient compliance with nasal CPAP therapy for sleep apnea. *Chest* 1986; 90:330-333.
- Issa F. G., Costas L. V., Berthon-Jones M., McAuley V. J., Bruderer J., Sullivan C. E. Nasal CPAP treatment for obstructive sleep apnea: long-term experience with 117 patients. *Am. Rev. Respir. Dis.* 1985; 13:A108.
- McEvoy R. D., Thornton A. T. Treatment of obstructive sleep apnea syndrome with nasal continuous positive airway pressure. *Sleep* 1984; 7:312-325.
- Hoffstein V., Viner S., Mateika S., Conway J. Treatment of obstructive sleep apnea with nasal continuous positive airway pressure. *Am. Rev. Respir. Dis.* 1992; 145:841-845.
- Engleman H. M., Martin S. E., Douglas N. J. Compliance with CPAP therapy in patients with the sleep apnea/hypopnea syndrome. *Thorax* 1994; 49:263-266.
- Meurice J., Dore P., Paquereau J., Neau J. P., Ingrand P., Chavagnat J., Patte F. Predictive factors of long-term compliance with nasal continuous positive airway pressure treatment in sleep apnea syndrome. *Chest* 1994; 105:429-433.
- Reeves-Hoche M. K., Meek R., Zwillich C. W. Nasal CPAP: an objective evaluation of patient compliance. *Am. J. Respir. Crit. Care Med.* 1994; 149:149-154.
- Kribbs N. B., Pack A. I., Kline L. R., Smith P., Schwartz A., Schubert N., Redline S., Henry J., Getsy J., Dinges D. Objective measurement of patterns of nasal CPAP use by patients with obstructive sleep apnea. *Am. Rev. Respir. Dis.* 1993; 147:887-895.
- Krieger J., Kurtz D., Petiau C., Sforza E., Trautmann D. Long-term compliance with CPAP therapy in obstructive sleep apnea patients and in snorers. *Sleep* 1996; 19:S136-S143.
- Giles TL, *et al.* Continuous positive airways pressure for obstructive sleep apnoea in adults. *Cochrane Database of Systematic Reviews* 2006; (3).
- Hensley M, Ray C. Sleep apnoea. *BMJ Clinical Evidence* 2009; 2301.
- Pepperell JC, *et al.* Ambulatory blood pressure after therapeutic and subtherapeutic nasal continuous positive airway pressure for obstructive sleep apnoea: A randomised study. *Lancet*, 359(9302): 204-210.
- Barbe F, *et al.* Long-term effect of continuous positive airway pressure in hypertensive patients with sleep apnea. *American Journal of Respiratory and Critical Care Medicine* 2010; 181(7): 718-726.
- Norman D, *et al.* Effects of continuous positive airway pressure versus supplemental oxygen on 24-hour ambulatory blood pressure. *Hypertension*, 2006; 47(5): 840-845.

25. Lam B, *et al.* Randomised study of three non-surgical treatments in mild to moderate obstructive sleep apnoea. *Thorax* 2007; 62(4): 354-359.
26. Milleron O, *et al.* Benefits of obstructive sleep apnoea treatment in coronary artery disease: A long-term follow-up study. *European Heart Journal* 2004, 25(9): 728-734.
27. Pépin JL, Leger P, Veale D, *et al.* Side effects of nasal continuous positive airway pressure in sleep apnea syndrome: study of 193 patients in two French sleep centers. *Chest* 1995; 107:375-381.
28. Jones DJ, Braid GM, Wedzicha JA. Nasal masks for domiciliary positive pressure ventilation: patient usage and complications. *Thorax* 1994; 49:811-812.
29. Smurthwaite GJ, Ford P. Skin necrosis following continuous positive airway pressure with a face mask. *Anaesthesia* 1993; 48:147-148.
30. Yong SC, Chen SJ, Boo NY. Incidence of nasal trauma associated with nasal prong versus nasal mask during continuous positive airway pressure treatment in very low birthweight infants: a randomised control study [published online ahead of print June 7, 2005]. *Arch Dis Child Fetal Neonatal Ed.* 2005; 90:F480-F483.
31. Scalf LA, Fowler JF Jr. Allergic contact dermatitis caused by dialkyl thioureas in a patient with sleep apnea. *Am J Contact Dermat* 1999; 10:169-171.