**CASE REPORT**

**Sustained periorbital edema following Mohs micrographic surgery in the setting of continuous positive airway pressure**

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**INTRODUCTION**

Obstructive sleep apnea (OSA) is a common breathing disorder affecting 5% to 7% of the population and is associated with increasing age, obesity, and male gender.1-3 Continuous positive airway pressure (CPAP) and variable positive airway pressure (VPAP) are first-line treatments of OSA,4 yet the use of these devices may not be solicited in the preoperative evaluation of patients who undergo Mohs micrographic surgery (MMS).

The impact of pressure devices on the skin has been reported in the literature. During the COVID-19 pandemic, CPAP/VPAP and doughnut-shaped head positioners used for bedridden and surgical patients have been identified as causal agents of CPAP/VPAP-induced edema. One possible mechanism is that sustained skin tissue damage induced by the continuous skin-contacting devices may lead to deformation-related cell damage and consequently inflammatory-edema reaction.5 This may then lead to tertiary ischemic-related cell damage if preventative measures, such as protective dressings under CPAP/VPAP mask and/or shape-conforming sleep aids (ie, memory foam pillows that diffuse soft tissue pressure and deformation) are not used.5

Here, we describe a case of persistent unilateral left-sided periorbital edema after MMS of the left cheek in a 78-year-old man with a history of OSA.

**CASE REPORT**

A 78-year-old man with a history of OSA who underwent MMS for treatment of basal cell carcinoma on the left infraorbital upper portion of the cheek (Supplementary Fig 1, available via Mendeley at [https://data.mendeley.com/datasets/zvg2ntp265](https://data.mendeley.com/datasets/zvg2ntp265)). The tumor was extirpated after one stage, with a final defect size of 1.4 × 1.2 cm to midsubcutaneous fat depth. The wound was subsequently repaired by primary closure with 4-0 vicryl and 5-0 monocril buried subcutaneous/dermal sutures and 5-0 fast-absorbing gut epidermal sutures. No retention, imbrication, or plication sutures were used. The final length of the repair was 4.3 cm. Burow’s triangles were removed in a standard fashion, with the superior Burow’s extending partially to the medial aspect of the lower portion of the left eyelid (Figs 1 and 2). Standard anticipatory preoperative guidance included expectations for periorbital edema and bruising. No immediate complications occurred during the procedure. A routine pressure dressing was applied (petrolatum, nonstick gauze, and stretch-roll tape) for 24 hours with instructions for 1 week of twice daily cleaning and petrolatum application thereafter.

Three months after surgery, he presented to his family medicine provider reporting profound, asymmetric left-sided periorbital edema (Figs 3 and 4). He was advised to follow up with his dermatologic surgical team. On assessment by the dermatologic surgery team, he reported that the edema was most prominent...
upon awakening in the morning. The edema would improve by the evening. The examination revealed normal visual acuity, a well-healing scar, and baseline edema of the lower portion of the right eyelid. There was more profound edema of the lower portion of the left eyelid. He was advised to perform a kneading scar massage 3 times daily for approximately 3 minutes.

At 6 months post-MMS, the patient reported ongoing edema, worst first thing in the morning, with overall minimal improvement despite regular scar massage. He reported that the edema was also present bilaterally before MMS, albeit milder. On examination, there was a prominent edema of the lower portion of the left eyelid edema without signs of seroma, hematoma, or infection, and mild edema of the upper portion of the left eyelid. There was no evidence of suture reaction, scar hypertrophy, or induration; the scar was soft, mobile, and not tethered down to deeper structures to suggest significant suture-induced deep lymphatic interruption. Intralesional steroids were offered but declined. He was noted to have geometric indentations on the left side of the face, which corresponded to the outline of his VPAP straps (Fig 5).
On questioning, the patient reported that he had been using a VPAP device nightly for OSA and exclusively slept on the left side of his face. The facial mask compressed the nasal bridge and cheeks. At the suggestion of the surgical team, he trialed a nighttime nasal cannula in place of the full facemask and noted a resolution after 1 night. However, he was unable to tolerate the cannula thereafter because of poor control of his OSA. He was encouraged to alter his sleep positions and to consider a different VPAP facial mask that did not compress the left side of the face. He was also referred to ophthalmology for the evaluation of baseline festooning.

Per ophthalmology, there was no evidence of acute pathology. Additional recommendations included using compresses, sleeping with the head in an elevated position, or referral to oculoplastics for blepharoplasty for the treatment of blepharochalasis.

DISCUSSION

This case demonstrates persistent periorbital edema following MMS and primary repair because of exacerbation of preexisting festooning in the setting of compression from his positive airway pressure device, which disrupted lymphatic clearance of surgery-related edema. The role of the positive airway pressure device is highlighted by the geometric indentation from the device, and the rapid resolution noted after a brief trial of the nasal cannula.

Although this patient experienced the primarily cosmetic impact of sustained periorbital swelling without functional compromise, there are other potential complications of periorbital edema to consider in the postoperative period. Complications include physical obstruction of the visual field that limits and changes work or social functioning, vision problems, pressure pain, or further skin breakdown.

For post-Mohs micrographic reconstruction outcomes that may be impacted by CPAP/VPAP devices, anticipatory postoperative guidance should be provided to patients. It should be noted that prolonged periorbital edema is possible from the reconstruction of wounds in the periorbital area, but in this case, resolved with transient VPAP discontinuation. The oblique indentation lines on the lateral aspect of both cheeks seen in Fig 5 are characteristic of VPAP use and may be remembered as the “VPAP sign.” CPAP/VPAP compression should be considered as a potential etiology for postoperative swelling, highlighting the importance of obtaining a proper history. A Mohs micrographic surgeon may also consider referring to nasal masks and nasal cannulas among others to patients for the management of OSA. The patient’s primary care provider, sleep specialist, or ophthalmologist may provide further insights and interventions to reduce postoperative facial swelling and manage edema-induced vision loss that is not self-remitting.

Conflicts of interest

None disclosed.

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