Persistent Oroantral Fistula Related to BiPAP Use for Obstructive Sleep Apnea
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Abstract

Educational Objective: Obstructive sleep apnea (OSA) is a significant health problem that may be treated with positive airway pressure; this treatment may interfere with healing after oral surgery.

Study Design: Illustrative case report.

Case Report: 80-year-old male with oroantral fistula after maxillary sinus lift with two failed surgical repairs due to use of BiPAP.

Introduction

Patients with tooth loss in the maxilla may undergo rehabilitation with dentures, dental bridges, single or multiple-tooth implants, or implant-supported dentures. When there has been bone loss due to tooth loss or gum disease, the maxilla may not be able to accommodate implants, and in this situation a maxillary sinus lift may be performed to augment the amount of bone prior to future treatment with implants. Usually several millimeters of bone are added, and the inferior sinus mucosa is lifted intact.

Maxillary sinus lift is complicated by local wound infections in 25% of cases, although only 3.9% progress to acute sinusitis.1 Even straightforward tooth extraction without maxillary sinus lift may result in sinusitis in 0.58% of cases.2 Chronic sinusitis may also develop after sinus lift, and may necessitate functional endoscopic sinus surgery for definitive treatment.3

Several options are available for treatment of oroantral communication.4 Minimally invasive techniques include injection of fibrin glue, collagen or hydroxyapatite into the area, but displacement of the material is relatively common. Typical techniques include bone grafting from intraoral donor sites, including the retromolar trigone area, or external sites including the chin, zygoma or iliac crest. Local soft tissue flaps are frequently used, including buccal flaps (Rehrmann), palatal flaps, and buccal fat pad flaps. The pedicled tongue flap has also been described, with pedicle takedown 3-4 weeks following inset. The use of synthetic materials such as gold or aluminum followed by a free mucosal graft or local flap is also performed.

Case Report


An 80-year-old gentleman with multiple comorbidities and severe OSA managed with BiPAP sought treatment with a community dentist for tooth loss. The patient utilized BiPAP at 20/14 cmH2O, and employed both a sticky chin stirrup and tape around the mouth to provide a seal for the device.

The patient underwent right maxillary sinus lift and augmentation in anticipation of dental implants. Following surgery, he developed an oroantral fistula and sinusitis. Complaints included rhinorrhea and sneezing, inability to draw water through a straw, and a whistling sound with breathing. There was no pain. CT scan of the sinus demonstrated mucosal thickening of the right maxillary sinus, a focal bony defect anterior to the remaining maxillary molar, an accessory ostium of the right maxillary sinus, and a right septal deviation. Medical treatment for sinusitis was prescribed with nasal saline irrigation, fionase and augmentin.

Five months later, the three remaining right maxillary teeth were extracted; simultaneously, bone grafting using Bio-Oss (bovine bone substitute) and a free mucosal membrane graft were employed to close the communication. The patient was seen in follow-up and found to have a persistent fistula. He described blowing of air through the fistula when he used his BiPAP machine, which likely hindered the healing process. Conservative treatment was attempted with cessation of BiPAP, use of nasal oxygen alone, and regular cleaning with hydrogen peroxide. This was unsuccessful.

Seven months later, a buccal sliding flap was performed to close a 10mm defect. Consultation with Sleep Medicine provided the option of a tongue retaining device and head-of-bed elevation in place of normal BiPAP use postoperatively. However, examination two weeks later disclosed persistent 2mm fistula at POD#14.

The patient subsequently underwent a third surgical repair which was successful in closing the oroantral fistula.

Discussion

Maxillary sinus augmentation entails a risk of oroantral fistula. Many patients with oroantral fistula develop sinusitis, which may require medical or surgical treatment. Surgery is indicated to close a persistent oroantral fistula. Use of positive pressure devices for OSA in the postoperative setting may be a risk factor for development of oroantral fistula after maxillary sinus augmentation, and may also delay or prevent healing of the fistula after surgical repair. Discussion of OSA management should be included in the informed consent process.

Figure 1. CT Sinus following maxillary sinus lift

Conclusion

Familiarity with management of OSA is critical for the modern otolaryngologist. The risks and benefits of positive airway pressure use following oral surgery should be carefully considered as a key aspect of surgical planning.

References