

Case Report

Open Access



Hearing voices and strange noises after sleeve gastrectomy

Evgeniya Larionova¹, Scharukh M. Jalisi², Daniel B. Jones¹

¹Bariatric and Minimally Invasive Surgery, Beth Israel Deaconess Medical Center, Boston, MA 02215, USA.

²Otolaryngology/Head and Neck Surgery, Beth Israel Deaconess Medical Center, Boston, MA 02215, USA.

Correspondence to: Evgeniya Larionova, NP, Bariatric and Minimally Invasive Surgery Department, Beth Israel Deaconess Medical Center, 330 Brookline Ave, Boston, MA 02215, USA. E-mail: elariono@bidmc.harvard.edu

How to cite this article: Larionova E, Jalisi SM, Jones DB. Hearing voices and strange noises after sleeve gastrectomy. *Mini-invasive Surg* 2020;4:59. <http://dx.doi.org/10.20517/2574-1225.2020.49>

Received: 25 May 2020 **First Decision:** 22 Jun 2020 **Revised:** 6 Jul 2020 **Accepted:** 9 Jul 2020 **Published:** 1 Sep 2020

Academic Editor: Wah Yang **Copy Editor:** Cai-Hong Wang **Production Editor:** Jing Yu

Abstract

Patulous eustachian tube (PET) dysfunction is a rare complication of weight loss, which can be easily misdiagnosed. We present a case of PET dysfunction after laparoscopic sleeve gastrectomy. A 36-year-old Caucasian female with Class III morbid obesity (131 kg, BMI 46.6 kg/m²) successfully underwent laparoscopic sleeve gastrectomy. At her postoperative follow-up appointment six months later, her weight dropped to 96 kg and she complained of severe autophony (hearing of self-generated sounds), leading to anxiety and insomnia. She was initially misdiagnosed with a sinus infection by her primary care provider and was started on antibiotics. She was subsequently seen by an otolaryngologist who diagnosed her with PET. Weight loss can be a predisposing factor for PET. Our patient did not notice onset of symptoms of PET until significant weight loss (35 kg, 59.5% EWL).

Keywords: Sleeve gastrectomy, bariatric surgery, patulous eustachian tube dysfunction, otolaryngology, the Ostmann fat pads, autophony

INTRODUCTION

Patulous eustachian tube (PET) can be difficult to identify and treat^[1]. PET was first described by H. Schwartze in 1864^[1]. PET is defined as a eustachian tube remaining persistently open^[2]. Common PET symptoms include autophony, aural fullness, and hearing one's own breathing (aerophony)^[1]. PET may be caused by rapid weight loss and the consequent wasting of adipose tissue that surrounds the cartilaginous part of the ET, the Ostmann fat pads^[2].



© The Author(s) 2020. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, sharing, adaptation, distribution and reproduction in any medium or format, for any purpose, even commercially, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.



The current literature reveals PET can be a complication of bariatric surgery such as Roux-en-Y-bypass and symptoms onset after 20 kg weight loss^[3]. A prospective cohort study in Brazil also showed association between gastric bypass (Fobi-Capella technique) and PET^[4]. A poster at the Sages 2017 annual meeting described a case of PET after sleeve gastrectomy with subsequent loss of 27.2 kg (EWL 70%), with BMI 37.9 kg/m²^[5]. We present a case of PET after laparoscopic sleeve gastrectomy and symptoms onset after subsequent weight loss of 35 kg (EWL 59.5%), with BMI 46.6 kg/m².

CASE REPORT

A 36-year-old Caucasian female with Class III morbid obesity (131 kg, BMI 46.6 kg/m²) presented to our multidisciplinary accredited bariatric program in April 2018. She successfully underwent laparoscopic sleeve gastrectomy surgery. At her postoperative follow-up appointment six months later, her weight dropped to 96 kg. She had lost 35 kg, EWL 59.5%. She also complained of severe autophony and aural fullness. She started to hear her own voice and different noises leading to anxiety and insomnia. She could hear her breathing when exercising. It began in her right ear and then she started to experience it bilaterally. There was no otalgia, otorrhea, or tenderness. She denied any history of ear infections, ear surgery, or noise exposure. Autophony was temporarily relieved with lowering her head between her knees or forward-bending. Her symptoms were rapidly progressing. She came to see her primary care provider and was initially misdiagnosed with a sinus infection.

She was started on antibiotics and nasal decongestants, which provided no relief. Nevertheless, her symptoms persisted, and she was subsequently seen by an otolaryngologist. At her otolaryngology visit, her otoscopy revealed clear ear canals. Pure tone testing revealed normal hearing, bilaterally. Word Recognition scores were excellent for each ear. Tympanometry revealed normal middle ear pressure and compliance, bilaterally. PET testing was positive for the right ear; changes to the immittance were synchronous with breathing and most pronounced in the occluded-nostril condition [Figure 1]. Normal hearing with evidence of PET was noted for the right ear. She was officially diagnosed with PET. She was offered medical treatment for PET and decided to monitor her symptoms before proceeding with any surgical intervention. She was recommended nonsteroidal anti-inflammatory medications but wanted to avoid them given history of sleeve gastrectomy. She was started on oxymetazoline for five days and advised to discontinue Flonase. She found acupuncture to be helpful to alleviate some of her symptoms.

DISCUSSION

There is no association between what type of bariatric surgery causes PET. Patients can present to their primary care providers with multiple vague symptoms, which can be challenging to diagnose; therefore, a detailed past medical and surgical history is required. Symptoms can vary from autophony, aural fullness, aerophony, foreign body sensation, and tinnitus to severe anxiety and insomnia^[6]. Symptoms can increase in frequency and duration with time and can be exacerbated with exercise. Symptoms can be relieved with posture (placing the head in a dependent position), upper respiratory infection, or ipsilateral internal jugular vein compression^[7].

Certain diseases such as multiple sclerosis, anorexia, or motor neuron disease can be associated with PET. It is important to consider all the possible differentials including psychiatric illnesses. Stress and anxiety were identified as novel risk factors and may heighten the awareness of internal auditory sounds. According to the literature, auditory verbal hallucinations or hearing voices (multiple voices or sounds such as whispering or murmuring) are the most common symptoms, particularly in schizophrenia^[8].

Our patient was appropriately referred to otolaryngology and diagnosed with PET. Treatment options for PET can be minimally invasive, medical, and surgical depending on the severity of symptoms^[2]. Medical

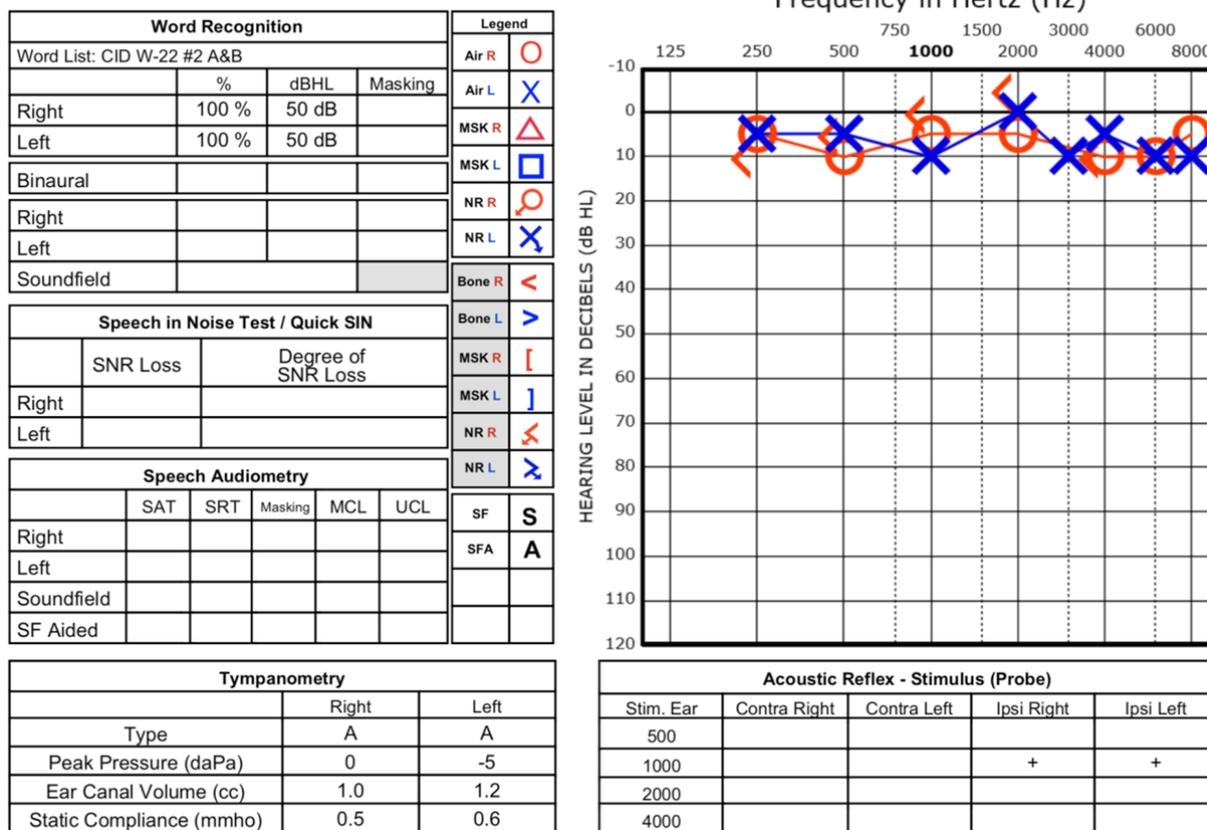


Figure 1. Our patient’s audiogram. SF: sound field; SAT: speech awareness threshold; SRT: speech reception threshold; MCL: most comfortable level; UCL: uncomfortable level; SIN: speech-in-noise; SNR: signal-to-noise ratio; SFA: sound-field audiometry; Air: auditory late response; NR: no response

options and minimally invasive options include topical estrogen or insufflation with salicylic or boric acid into the ET pharyngeal orifice. Adequate hydration, nasal saline drops, and saline irrigations can be effective options for symptom management. Decongestants or nasal steroids can, on the contrary, worsen the symptoms. Surgical options are reserved for patients with severe symptoms and include tympanostomy tube insertion, ligation of the orifice, intraluminal catheter placement, cartilage grafting, complete occlusion of the ET, and hamulotomy^[1,9]. It remains unclear whether weight gain can contribute to symptom improvement. Further research is needed to explore the advantages of current treatment options.

Intensity of PET symptoms might vary^[10]. Our patient’s symptoms are currently intermittent and tolerable. She did find saline nasal irrigations to be helpful to relieve her symptoms. Our patient continues to lose weight and denies any worsening of her symptoms. It would be helpful to continue to evaluate the severity of symptoms in regards to her weight. PET may be triggered by significant weight loss after sleeve gastrectomy. Raising awareness of the possibility to develop PET after bariatric surgeries would facilitate the right diagnosis and allow appropriate referral and disease management.

DECLARATIONS

Authors’ contributions

Manuscript writing: Larionova E

Final approval of manuscript: Jalisi SM, Jones DB

Availability of data and materials

Not applicable.

Financial support and sponsorship

None.

Conflicts of interest

All authors declared that there are no conflicts of interest.

Ethical approval and consent to participate

We obtained the patient's consent for publication of the present literature.

Consent for publication

Not applicable.

Copyright

© The Author(s) 2020.

REFERENCES

1. Hussein AA, Adams AS, Turner JH. Surgical management of Patulous Eustachian tube: a systematic review. *Laryngoscope* 2015;125:2193-8.
2. Bance M, Tysome JR, Smith ME. Patulous eustachian tube (PET), a practical overview. *World J Otorhinolaryngol Head Neck Surg* 2019;5:137-42.
3. Alhammadi M, Jönsson R, Olbers T, Yassin O. Patulous eustachian tube complicating gastric bypass surgery. *J Laryngol Otol* 2009;123:1058-60.
4. Pascoto G, Abreu C, Silva ML, Weber R, Pignatari SS, et al. The impact of acute loss of weight on eustachian tube function. *Int Arch Otorhinolaryngol* 2014;18:376-9.
5. SAGES. Autophony after laparoscopic sleeve gastrectomy: a case report. Available from: <https://www.sages.org/meetings/annual-meeting/abstracts-archive/autophony-after-laparoscopic-sleeve-gastrectomy-a-case-report/>. [Last accessed on 13 Jul 2020]
6. Schilder AG, Bhutta MF, Butler CC, Holy C, Levine LH, et al. Eustachian tube dysfunction: consensus statement on definition, types, clinical presentation and diagnosis. *Clin Otolaryngol* 2015;40:407-11.
7. Ward BK, Ashry Y, Poe DS. Patulous eustachian tube dysfunction: patient demographics and comorbidities. *Otol Neurotol* 2017;38:1362-9.
8. McCarthy-Jones S, Longden E. Auditory verbal hallucinations in schizophrenia and post-traumatic stress disorder: common phenomenology, common cause, common interventions? *Front Psychol* 2015;6:1071.
9. Luu K, Remillard A, Fandino M, Saxby A, Westerberg BD. Treatment effectiveness for symptoms of patulous eustachian tube: a systematic review. *Otol Neurotol* 2015;36:1593-600.
10. Ikeda R, Kikuchi T, Oshima H, Kobayashi T. Diagnosis of the patulous eustachian tube. *Ear Nose Throat J* 2020:145561320925938.