CASE STUDY

Uncommon Aetiology for Autophony: Patulous Eustachian Tube

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KEYWORDS
Eustachian tube; Indwelling catheter; Bone wax

Abstract  We report the case of a patient with autophony diagnosed with a patulous Eustachian tube. The patient was treated according to the technique described by Bluestone and Cantekin, inserting an indwelling catheter into the tube. Good results were obtained after one year of monitoring.

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PALABRAS CLAVE
Trompa de Eustaquio; Catéter permanente; Cera de hueso

Autofonía de etiología infrecuente: síndrome de la trompa patulosa

Resumen  Presentamos el caso de un paciente con autofonía, diagnosticado de síndrome de la trompa patulosa y tratado mediante cierre de la trompa con catéter según la técnica modificada de Bluestone y Cantekin en el que se obtuvieron buenos resultados tras un año de seguimiento.

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Introduction

Patulous Eustachian tube syndrome (or patent Eustachian tube syndrome) is a rare entity whose main symptom is autophony, which characteristically improves by adopting the supine position or placing the head between the knees. The aim of this work is to present a patient who was clinically diagnosed with patulous Eustachian tube syndrome and treated through surgery with satisfactory results.

Case Report

We present the case of a 38-year-old male in treatment for morbid obesity for 6 years, who had lost 20 kg of weight in the previous 12 months and who attended consultation after being assessed by 3 other professionals. The patient had also undergone placement of a ventilation tube in the left ear due to a sensation described as auditory ”vibration” and autophony in the left ear, with 1.5 years of evolution.

The otoscopic image revealed a small, calcareous plate occupying the anteroinferior quadrant of the tympanic membrane of the left ear, with no signs of occupation of the tympanic cavity. The otoscopy of the right ear was normal. Tone audiometry of the right ear showed a bone pathway of 30 dB, with a threshold of 10 dB at low frequencies and sensorineural drop at a frequency of 4000 Hz, probably related to acoustic trauma. In the left ear, the bone and air pathways were overlaid in 30 dB (20 dB in a frequency of 500 Hz).

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with a symmetrical sensorineural drop regarding the right side. The impedanciometry showed both curves centered at zero with less compliance in the left ear.

During the otomicroscopic examination, the patient reported improvement of symptoms in the supine position. Upon suspicion of patulous tube syndrome, the patient was asked to place his head between his knees. He then reported a decrease of symptoms in this position.

Therapy consisted in the insertion of a No. 22 Abbocath intravenous catheter (Fig. 1) in the protympanic portion of the Eustachian tube according to the technique described by Bluestone and Cantekin,\(^1\) which consists in an infiltration at the level of the 4 quadrants of the external ear canal through a semicircular incision at about 8 mm from the tympanic annulus in its anterior portion in order to lift the tympanomeatal flap. When the flap is lifted it is possible to identify the opening of the Eustachian tube, which is then occluded using a catheter closed with bone wax at one end (Fig. 2). The flap is then replaced in its anatomical position and a myringotomy is performed to place a ventilation tube in order to prevent middle ear effusion and the potential development of chronic otitis.

During follow-up, the patient presented an episode of otorrhea at 2 months which was successfully treated with topical antibiotics. Extrusion of the ventilation tube took place at 5 months, and 8 months later the symptoms had improved markedly.

**Discussion**

The Eustachian tube is responsible for regulating pressures within the middle ear in order to protect its structures against sudden changes. It normally remains closed, with short opening periods due to the action of the tensor veli palatini and levator veli palatini muscles (soft palate tensor and elevator). When a patient suffers patulous Eustachian tube, this structure remains permanently open, causing an abnormal flow of air from the nasopharynx to the middle ear during breathing.

According to Zollner, quoted by Brackmann et al.,\(^2\) the incidence of patulous tube syndrome in the general population is between 0.3% and 6.6%.\(^3\) This variability in incidence values is related to the diagnosis going unnoticed, since, in many cases, autophony symptoms in a patient are not immediately associated with patulous tube condition.

A lesion at the level of the central nervous system affecting the correct function of the palatal musculature may result in a patulous tube. Moreover, it has also been linked to high levels of estrogen and prostaglandins through the reduction of internal secretions. However, the most common cause of this entity is weight loss,\(^4\) especially in situations of chronic disease with an oncological, psychiatric or endocrine cause, which lead to peritubular soft tissue atrophy.

The main symptom is autophony which worsens whilst standing, with the use of topical or systemic decongestants drugs, exercise and anxiety. Improvement is observed in situations which increase venous congestion in the peritubular area, such as the supine position, flexion of the thorax over the legs while seated or nasal and postnasal mucosal congestion.

The diagnosis is mainly clinical. Otoscopy and audiometry are usually normal, although Robinson and Hazell described an association between patulous tube and sensorineural hearing losses of unknown etiology in the affected ear.\(^5\) This situation was not considered in the case of our patient, since his hearing loss was sensorineural, bilateral and symmetrical with a drop in high tones.

Tympanometry shows path fluctuations which coincide with breathing phases and which typically disappear when the test is repeated whilst holding breath.

Patel and Levine mentioned the usefulness of axial sections of computed tomography scans in the diagnosis of doubtful patulous tube cases, although these are not necessary in cases with a clear clinical diagnosis.\(^6\)

Intranasal administration of anticholinergic agents and estrogen drops, oral potassium iodide, atropine, boric acid, application of nitric acid and phenol are some of the medical treatments which can temporarily alleviate symptoms.\(^2\)

As for surgical treatment, myringotomy with placement of a ventilation tube can also improve symptoms temporarily.\(^4\)

At present, there are few studies that have focused on tubal function. Multiple factors involved in patulous tube syndrome have been described, as well as an extensive therapeutic arsenal with varied effectiveness. Recent alternatives include injection of hydroxyapatite through transoral endoscopy in the region of the pharyngeal wall and torus tubarius,\(^7\) although this practice is not yet widespread. The best lasting results have been reported with surgical closure using a catheter, as in our case. This is a valid alternative for cases refractory to medical treatment.
or when symptoms significantly affect the quality of life of patients.²

**Conflict of Interests**

The authors have no conflict of interests to declare.

**References**


