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CLINICAL CASE REPORT

Acupressure Bead in the Eustachian Tube

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Abstract
In this article, we aim to enlighten practitioners and patients involved with acupressure beads and to contribute to their safer use by reporting a unique case of insidious intrusion of an acupressure bead into the eustachian tube. A metallic object was found in the eustachian tube of a patient while conducting a magnetic resonance imaging (MRI) examination. The object was later confirmed to be an auricular acupressure bead, and was successfully removed by performing a tympanoplasty and a canal wall down mastoidectomy. The bead was assumed to have passed through an existing perforation of the tympanic membrane. According to previously published literature, tympanic membrane perforations exist in ~1% of the population. Therefore, middle-ear foreign bodies are relatively common occurrences for otolaryngologists. However, metallic objects such as acupressure beads are especially important in the sense that they can cause severe burns during MRI. To avoid potential complications, acupressure-bead practitioners should be aware of the possibility that intrusions through the tympanic membrane could go unnoticed.

1. Introduction

The therapeutic use of auricular acupressure beads as an alternative to medicine is considered a safe, noninvasive approach to treating various medical conditions [1,2]. The process involves the placement of a small gold-plated ball onto a specific auricular point using a tape. Here, we present a case with a unique presentation and an intrinsic risk due to an acupressure bead becoming lodged in the eustachian tube. To our knowledge, no previous reports concerning the discovery of an acupressure bead as a foreign body in the middle ear have been published.

2. Case Presentation

A 55-year-old woman was scheduled for a cranial magnetic resonance imaging (MRI) as part of an annual routine checkup. During the scanning procedure, the MRI technician detected a small metallic object in the left middle ear

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and stopped the procedure immediately. Computed tomography (CT) imaging revealed a foreign body at the tympanic opening of the left eustachian tube (Fig. 1). The patient reported a history of tympanic membrane perforation at the age of 23 years, but denied any medical treatment. She had recently been trained as an acupressure therapist and admitted to self-administering bilateral auricular point acupressure beads to facilitate weight loss. Multiple attempts at removal through the tympanic membrane perforation under local anaesthesia and through the transmeatal approach under general anaesthesia failed to locate the foreign body.

Postoperative cranial CT confirmed that the residual foreign body had been displaced deeper into the eustachian tube (Fig. 2). The patient was asymptomatic for 1 month after the first operation, at which time she began to suffer left-side hearing loss, intermittent left otalgia, and numbness of the left side of the tongue. A second operation was performed. A canal wall down mastoidectomy and temporary removal of the incus provided access to the deeper area of the eustachian tube. Ultimately, a 2-mm-diameter spherical object was recovered. The foreign body was a gold metallic ball covered with brown, sludged tissue (Fig. 3). A tympanoplasty type IIIc was performed using the autologous incus. The patient affirmed that the foreign body was the acupressure bead (Fig. 4). Postoperative cranial CT confirmed complete removal of the foreign body, and all symptoms were relieved after the second operation.

3. Discussion

Nowadays, acupressure beads are considered a safe, noninvasive way to treat certain conditions such as anxiety, depression, and obesity [1,2]. Because of their convenience, they are appreciated by and accessible not only to specialists but also to members of the general public who have little or no experience with their use. Therefore, acupressure beads are widely used internationally. Here, we report an instance of an acupressure bead entering the middle ear through an existing perforation of the tympanic membrane and becoming lodged in the tympanic orifice of the eustachian tube.

A review of the literature revealed that foreign bodies commonly found in the middle ear are tympanostomy tubes, impression material used to make ear molds, and sludge from welding [3—5]. Compared with other middle-ear foreign bodies, acupressure beads are important for two reasons. First, acupressure beads can cause burns during MRI because they are made of a metallic material. In

Figure 1 Computed tomography image showing a round foreign body in the left eustachian tube.

Figure 2 Computed tomography image showing the foreign body displaced deeper into the eustachian tube.

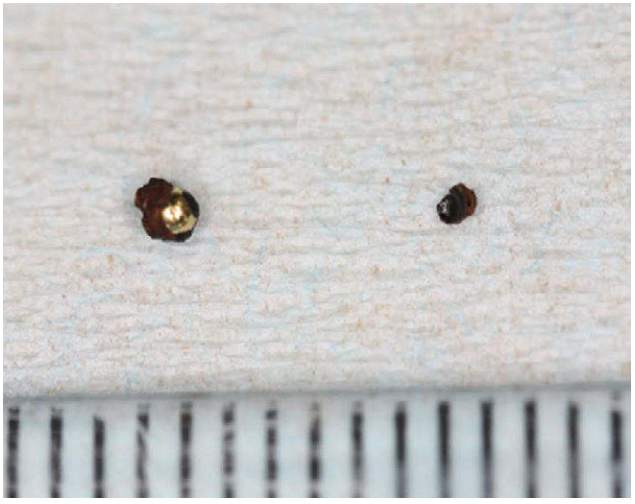

Figure 3 The acupressure bead that had been lodged in the left eustachian tube.

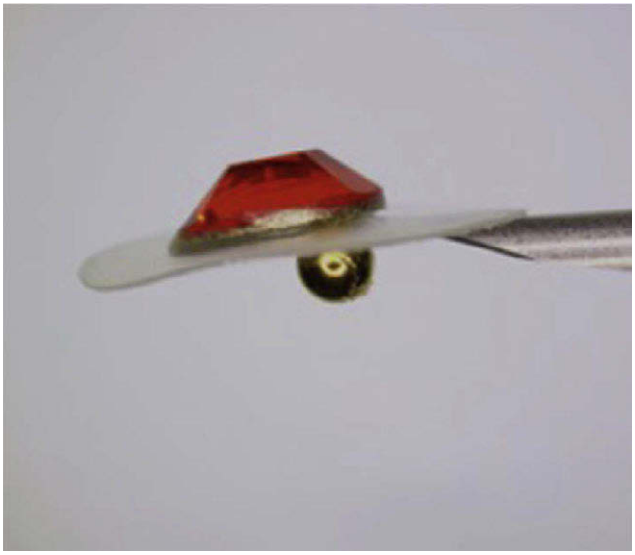

Figure 4 A sample acupressure bead obtained from the patient. A gold-plated iron ball is pasted on one side of a piece of double-sided tape, and a piece of lead glass is pasted on the other side.

this case, the MRI technician made an emergency stop to prevent a serious burn. In other words, if the imaging had not been stopped, the resulting burn might have caused adhesion, which might have resulted in the obliteration of the eustachian tube. The fact that the internal carotid artery lies next to the eustachian tube is noteworthy because severe damage to the tube could cause serious harm to this important vessel. Second, the bead could have easily rolled deeply into the middle ear due to its small size and spherical shape. In this case, the extraction of the bead was extremely difficult, requiring multiple attempts in the outpatient office and two operations under general anesthesia. The main obstacle to extracting the bead was the fact that it had become lodged in the tympanic orifice of the eustachian tube. Even with the use of a microscope under general anesthesia, gaining access to the tympanic orifice without removing the posterior wall of the external auditory canal was impossible. One method that we could have considered was the use of an endoscope because it might have provided a better view of the tympanic orifice without the need for a mastoidectomy. However, even if we had used an endoscope and had been able to locate the bead, with the surgical tools we had at that time, capturing it would have been impossible.

Middle-ear foreign bodies are relatively common occurrences for otolaryngologists. Indeed, cases in which tympanostomy tubes, sludge, and ear-mold impression material were identified as middle-ear foreign bodies have repeatedly been reported [3—7]. In addition, the prevalence of chronic tympanic membrane perforations is high [8]. Given the severity of the potential harm that middle-ear acupressure beads can cause, acupressure-bead practitioners, either professional or amateur, should be aware of this characteristic.

We propose some measures to prevent such cases. First, examining the patient's ear canals at the initiation of treatment with acupressure beads to detect tympanic membrane perforation should be encouraged. Because acupressure-bead practitioners are normally not accustomed to performing ear examinations, we recommend that acupressure-bead practitioners refer patients to otolaryngologists for such examinations. Second, a history of acupressure-bead use should be obtained before MRI is conducted. Third, a nonmetallic and/or nonspherical bead might be less harmful and less mobile. For example, Chinese *Vaccaria* seeds are likely to be more acceptable. Fourth, we propose modifying the fragile structure of the bead. Most popular acupressure beads consist of a bead that is attached to the auricle using double-sided tape, with the bead on one side of the tape and a piece of fashionable jewelry on the other side (Fig. 4). Attaching the bead to the tape in a stronger manner or sealing the bead between two pieces of tape would be preferable. Last, but not least, patients should be instructed to check the position of the bead on the skin and its adherence to the skin every time it is uncovered.

Given the vast popularity of auricular acupressure beads, restricting their use would be unrealistic. Rather, disclosing the potential complications associated with their use and educating users about measures that can be taken to avoid those complications would be much more realistic. We believe this case could enlighten those involved with the use of acupressure beads and contribute to their safer use.

Disclosure statement

The authors declare that they have no conflicts of interest and no financial interests related to the material of this manuscript.

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