

Single Case – Headache

Migraine Symptoms Induced by an Auricular Piercing in a 27-Year-Old Female: A Case Report

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Abstract

Introduction: Migraines are common and debilitating, and have high direct and indirect costs. They can be difficult to treat, and many patients make use of alternative medicine techniques. One of these is acupuncture applied to locations on the auricle thought to modulate migraine symptoms. Some patients obtain piercings in these locations in hopes of relieving their symptoms; however, the literature does not address the possibility of migraine symptoms being worsened or even induced by such piercings. **Case Presentation:** We present a case of a 27-year-old female with a history of transient hemiplegia without headaches who developed headaches, visual disturbances, and nausea after a piercing of the inferior crus of her left antihelix (known as a rook piercing). No abnormalities were found on workup, and symptoms were treated with supportive care. After removing the piercing 9 months later, the patient's symptoms resolved. **Conclusion:** The mechanism linking the piercing with the migraine symptoms is unclear, but may involve modulation of trigeminal or vagal pain pathways, as both of these cranial nerves innervate this area of the auricle. Regardless, in patients presenting with migraine symptoms, history and physical exam should not overlook piercings as potential contributory factors.

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Introduction

Migraines affect about 15% of the US population [1] and rank among the top 3 most burdensome neurological disorders along with stroke and dementia [2]. They are associated with high direct and indirect medical costs [3]. In addition to standard-of-care treatments, almost half of American migraine sufferers turn to some form of complementary or

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alternative medicine in search of relief [4]. One popular form of alternative medicine is acupuncture. Acupuncture has its roots in traditional East Asian medical practices that are based on the theory that certain points on the body are able to modulate activity in distant areas [5]. Some of these points are located on the auricle, giving rise to a subgenre of acupuncture known as ear acupuncture or auricular acupuncture. Auricular acupuncture or piercing involves manipulation of specific locations on the auricle that are thought to modulate migraine symptoms. There are no high-quality controlled studies that support the efficacy of these practices for migraine symptom control [6], but there are case reports and case series, mostly within the alternative medicine literature, that report symptom relief with auricular acupuncture or auricular piercing [7]. Specifically, helical crus (Fig. 1) piercings, known as daith piercings, have been used to mitigate migraine symptoms [8].

Acupuncture and piercing are generally considered low risk. The most commonly reported complications are infectious, with chondritis and cellulitis reported. These are followed by cosmetic complications such as keloid or other auricular deformity [9]. However, the potential of acupuncture or piercing to induce migraine symptoms has not been explored. To our knowledge, there are no published reports of auricular acupuncture or piercing causing migraine symptoms in a previously asymptomatic individual. Here, we present a case of migraine-like symptoms that began immediately after a piercing of the inferior crus of the antihelix (colloquially known as a rook piercing) in a 27-year-old female with no prior history of migraines. The CARE Checklist has been completed by the authors for this case report, attached as online supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000536132>).

Case Report

A 27-year-old female with a history of cramp fasciculation syndrome, distant history of transient hemiplegic episodes, and no past history of migraine with aura reported persistent headaches, nausea, and occasional ipsilateral extremity weakness and paresthesias after a piercing of the inferior crus of her left antihelix (Fig. 1). She obtained her piercing from a reputable practitioner; jewelry made of ASTM F-136 grade (implant grade) titanium was used (Invictus Body Jewelry). Within 24 h of the piercing, she began experiencing vague headaches and nausea, which persisted over the next few weeks. These symptoms were mild (3/10 pain, responding to 1/10 with acetaminophen), and the patient believes she may have acclimated to them within a month though they may still have been present. Then, 5 months after the piercing, her symptoms worsened. Her headaches and nausea were worse than before, with pain increasing from an average of 3/10 to 6/10. Headaches became localized between and behind her eyes. She developed visual disturbances and photophobia without phonophobia. Episodes increased in frequency, now occurring daily for nearly the whole day. The patient treated her symptoms with acetaminophen which was helpful although she cannot recall how much it decreased her pain. After additional 2 months, she also began suffering from occasional ipsilateral extremity weakness and numbness/tingling.

Of note, the patient does have a history of transient hemiplegia and hemiparesthesia without headaches 4 years prior; at that time, CT neck, MRI spine, MRI brain, and carotid ultrasound were unremarkable, and symptoms responded to physical therapy. In the context of this prior normal imaging and clinical course, further testing was not pursued for her current symptoms. Physical exam was unremarkable and showed a clean piercing with no signs of infection. The patient continued with migraine-supportive care. Ultimately, after 9 months, the patient removed the piercing for routine cleaning and upon removal noted the resolution of her symptoms within 1 min. She has not replaced the piercing since then. Of note,



Fig. 1. Rook piercings involve the inferior crus of the antihelix (**a**). The patient's piercing extends vertically through the inferior crus (**b**). The superior crus of the antihelix (**c**) and helical rim (**d**) are also shown. The crus helix (**e**) is the location of the daith piercing which is different than the rook piercing and may reduce migraine symptoms in some patients.

she informed her initial piercing practitioner, who then shared anecdotal reports of similar cases, in which there was an association between various head piercings and migraines, particularly for piercings in the auricular cartilage. She has heard similar anecdotal reports in the community, all involving rook piercings.

Since removal of the piercing, the patient has experienced intermittent, similar migraine symptoms starting about 72 h after removal. These have not been as frequent as they were while the piercing was in place. It should be noted that this patient did not develop any other complications of her piercing, such as allergy, chondritis, cellulitis, hematoma, or keloid. This patient has also had multiple piercings of other locations of the auricle (Fig. 1), including the lobule, the stem of the antihelix, and the helix. She did not suffer similar symptoms immediately after any of these piercings and had no changes in symptoms when these were inserted or removed.

Discussion

The innervation of the external ear is complex, including contributions from the trigeminal nerve, facial nerve, and vagus nerve, as well as the lesser occipital and greater auricular nerves which are branches of spinal nerves C2 and C3 [10, 11]. The inferior crus of the antihelix (the site of the rook piercing) alone is innervated by contributions from both the trigeminal nerve, which innervates the superior aspect of this structure, and the vagus nerve, which innervates the inferior, as well as potential contributions of the facial nerve. Trigeminal nerve pain pathways have long been theorized to produce migraine symptoms [12]. According to some theories, migraines involve nociceptors of meningeal blood vessels that follow afferent trigeminal pathways to the spinal nucleus of the trigeminal nerve. These pathways may also share input from surrounding extracranial soft tissues [12]. This is the theory behind the use of sphenopalatine ganglion block for migraine, trigeminal neuralgia, and cluster headache symptom relief [13]. Furthermore, it has been postulated that the similar daith piercing (involving the helical crus) could exert anti-migraine effects via vagal modulation of pain pathways [14]. Indeed, some studies report vagus nerve stimulation as a method for reducing migraine symptoms [15].

Even if trigeminal and/or vagal pain pathways are associated with migraines, it is not obvious how auricular acupuncture/piercing can act via these pathways to alleviate migraine pain in some patients but cause them in the current patient. The patient's history of transient hemiplegia/hemiparesthesia with negative workup raises the possibility of hemiplegic migraine history. This is further supported by the hemiplegia and hemiparesthesia that accompanied her post-piercing symptoms. If this diagnosis is correct, her new headaches, nausea, and visual disturbances could be changes in migraine symptoms rather than new migraine onset. While a history of hemiplegic migraine could explain a predisposition to developing new migraine symptoms, the question remains as to why a rook piercing would exacerbate rather than alleviate her symptoms. Another possibility involves her history of cramp fasciculation syndrome, a rare neuromuscular hyperexcitability disorder that affects peripheral neurons [16]. This syndrome may predispose to hyperexcitability of migraine-related pain pathways that are anatomically linked to her piercing site [16], though migraines are not commonly attributed to cramp fasciculation syndrome in the literature. Finally, it is worth noting that in most of the literature proposing benefits of such techniques, the piercings in question involve the helical crus (daith piercings) rather than the antihelix (rook piercings). The literature on auricular acupuncture/piercing is not sufficient to assess the impact of exact piercing location (crus helix vs. antihelix) on migraine symptoms. Literature on rook piercings specifically is sparse, and it is unclear whether the negative effects of this piercing in the above patient are related to its location in the antihelix rather than the helix. Regardless of the details of pain modulation leading to the above observations, this case indicates that more research is needed to establish a relationship between auricular piercing and migraine, and, if they truly are statistically related, to understand the pain pathways that underlie this pathology.

Conclusion

Given that migraines are simultaneously widespread, incompletely understood, and sometimes difficult to treat, it behooves the clinician to explore even unusual etiologies when assessing a migraine patient. In this case, while the symptoms appear to have had an unusual etiology, they were straightforwardly treatable by merely removing the piercing. While the use of auricular piercings as an alternative medicine strategy for ameliorating migraine symptoms is on the rise, these piercings are seldom considered to be a potential migraine trigger, and literature on this topic is lacking. In the future, clinicians involved in diagnosing or treating migraines may want to consider the role of auricular piercings, as removing the piercing may be a low-risk way to alleviate symptoms. In addition, further research is needed into the relationship between auricular piercing and migraine.

Statement of Ethics

Ethical approval is not required for this study in accordance with local or national guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

Conflict of Interest Statement

The second author is the patient who is the subject of this case report. The authors have no other conflicts of interest to declare.

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Author Contributions

S.U.: preparation of manuscript. J.T.: clinical information, images, and editing manuscript.

Data Availability Statement

No data beyond the figures are associated with this case report. All data generated or analyzed during this study are included in this article and its online supplementary material files. Further inquiries can be directed to the corresponding author.

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