CASE REPORT

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An Osteopathic Approach to Vertigo with Galbreath Technique: A Case Report

Abstract

Vertigo is a symptom with a wide range of etiologies as diverse as the patients it affects. The wide spectrum of etiologies can make a diagnosis difficult and therefore delay definitive treatment. The diagnosis is not commonly linked to somatic dysfunctions, however these somatic dysfunctions may be contributing to or causing a problem altogether. This case highlights the importance of investigating for somatic dysfunctions related to a patient's presentation. A 73-year-old female presented with a history of vertigo and a current feeling of fullness and ringing in her ears. She was found to have significant Eustachian tube dysfunction related to her condition. An osteopathic approach with emphasis on the Galbreath technique was utilized to relieve her ear symptoms and decrease her ongoing episodes of vertigo.

Background

Vertigo is a term used to describe several conditions that cause illusory movement.¹ The perceived movement can be described as the room spinning, whirling, or turning around the patient.² Vertigo itself is a symptom, not an ultimate diagnosis, and the causes include, but are not limited to, mechanical, behavioral, chemical, genetic, and iatrogenic means. When gathering the patient's history, it is important to ascertain the onset/duration of symptoms, description of the perceived movement, associated symptoms such as hearing loss or tinnitus, and contributing factors such as new medications and medical history such as hypertension, migraine, or diabetes. These conditions, as well as many others, can cause the patient to feel symptoms of faintness, disequilibrium, and/or light-headedness which are commonly mistakenly referenced as vertigo. Gathering a thorough history and physical exam, the practitioner can clue into whether the vertigo is due to an asymmetry in the architecture or chemistry of the vestibular system or if it related to something else entirely. While a majority (90%) of vertigo cases are peripheral due to conditions such benign paroxysmal positional vertigo (BPPV), vestibular neuronitis, otitis media, Eustachian tube dysfunction (ETD), or Meniere's disease, 10% of patients can present with symptoms such as associated weakness or numbness, diplopia, or vertical nystagmus that does not fatigue.³ These more sinister signs of central vertigo can include conditions such as multiple sclerosis, cerebellar stroke, or vertebrobasilar insufficiency which warrant further workup.

Disclosures

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Keywords

Galbreath technique, vertigo, Eustachian tube dysfunction A dysfunction within the anatomy of the middle and inner ear can frequently lead to vertiginous symptoms. While the most common reason to have peripheral vertigo is BPPV due to dislodged canaliths within the semicircular canal, ETD has also been reported.⁴ The Eustachian tube (ET) is a cilia-lined valve between the middle ear and nasopharynx.⁵ In adults, it is approximately 3.5 cm in length.⁶ It is divided into a lateral osseous portion and a medial fibrocartilaginous portion. Normally, the cartilaginous part is closed but opens with the use of certain muscles or alterations to external air pressure.7 The muscles that are known to contribute to its function include the lateral and medial pterygoid muscles, salpingopharyngeal muscle, levator veli palatini, and tensor veli palatini muscle.⁵ The tensor veli palatini muscle is the most significant in middle ear function for its involvement with opening the lumen of the ET upon activation and mastication. These muscles are innervated by the pharyngeal plexus of the vagus nerve and the mandibular branch of the trigeminal nerve. The pterygoid plexus is bordered by the medial and lateral pterygoid muscles and the temporalis muscle, where venous return is drained into the maxillary vein.8 Physiologically, the ET regulates middle ear air pressure, drains mucus, and protects against secretions and microorganisms.9

When the function of the Eustachian tube fails, it does not open and close properly or drain appropriately, and there is a risk of developing otitis media, tinnitus, or vertigo.¹⁰ This leads to multiple pathologies, the most classic of which is otitis media in young children. Retained fluid and secretions can exert pathologic forces on the middle ear and become a nidus for infection. Vertiginous symptoms can be explained due to the pressure increase that occurs within the middle ear cavity that is transmitted to the perilymph within the vestibular apparatus.⁴ Current treatments for ET dysfunctions include pharmacotherapy, such as a steroid nasal spray, as well as surgical intervention such as myringotomy tubes.¹¹

While pharmacotherapy is effective long term, it can take up to 4 weeks for the patient to experience initial improvement. The Galbreath technique can instantly help relieve symptoms of ETD by opening the Eustachian tube which facilitates lymph drainage.¹² With application of rhythmic manipulation to the mandible, the physician compresses and releases the pterygoid plexus, allowing for drainage of the middle ear and Eustachian tube to the nasopharynx.¹³ This treatment can be done in a supine or seated nature depending on the ease of positioning. Figure 1. Pain diagram on intake form. Legend: • • = aching; /// = stabbing



This manipulation affects the pressures within the middle ear and ET, opening the lumen and improving drainage. An intraoral technique called the Muncie technique also addresses dysfunction of the Eustachian tube.⁸ This technique is beneficial in treating the nasopharyngeal orifice of the Eustachian tube, however, patients may not tolerate it because it may cause discomfort and gagging.

Report of Case

History of Present Illness

A 73-year-old female presented to the clinic for ongoing care of neck and shoulder pain. Her pain diagram during this visit is shown in Figure 1. She had a long-standing history of benign paroxysmal positional vertigo, usually managed with physical therapy and avoiding cervical hyperextension. One month prior to her current visit, she had come in urgently for treatment of a significant acute vertigo episode after hyperextension of the neck in the sink at a hair salon and was successfully treated. At her current visit, she complained of intermittent vertigo, buzzing and ringing in her ears, and a feeling of fullness in her ears.

Medical History and Review of Systems

Medical history was significant for chronic neck pain with mobile, but not unstable, C3-4 spondylolisthesis, bilateral temporal headaches, benign paroxysmal positional vertigo, chronic low back pain, and myofascial pain syndrome. Surgical history was significant for tonsillectomy, cholecystectomy, hysterectomy, and an unspecified

System	Somatic Dysfunctions	Techniques applied
Head	Occipitoatlantal (OA) Extended, SBIRr	Muscle Energy (ME)
	Condyle restriction, L>R	Myofascial release (MFR)
	Temporal restriction, L>R	Temporal rocking - cranial
	Eustachian tube dysfunction, bilaterally	Galbreath technique utilized b/l - resulting in significant postnasal drainage, and even coughing from the drainage.
Cervical	Atlanto-axial joint rotated, left	ME
	C5 Flexed, RrSBr	ME
	SCM tight right	ME, MFR
Thoracic	Thoracolumbar shift left	Still Technique (Still)
Lumbar	Lumbopelvic roll left, IC high left	Still
Pelvis	Posterior innominate rotation, left	High Velocity Low Amplitude - leg tug
Upper Extremity	UT tenderpoint (tp), bilaterally	Counterstrain (CS)
Lower Extremity	Piriformis tight, left	ME
	Psoas tp, left	CS
Thoracic Inlet	T1 RISBI; First rib elevated on the right	Still, ME
Rib	Ribs 1-8 Inhalation somatic dysfunction, key rib 8, left	Balanced Ligamentous Tension

 Table 1. Osteopathic Structural Exam.

operation of the left salivary gland. Social and family history is noncontributory.

Physical and Osteopathic Structural Exam

Vital signs revealed 116/75 blood pressure and 69 bpm heart rate. The patient was awake, alert, and oriented in no acute distress. She was well dressed and well nourished. Her HEENT exam demonstrated a normocephalic head with no lesions on the external ear and clear external auditory canals bilaterally. The oropharynx contained moist mucous membranes without erythema or exudates.

On osteopathic structural exam, the patient was found to have occipitoatlantal joint extended sidebent left rotated right, bilateral occipital condyle restriction, atlantoaxial joint rotated left, sternocleidomastoid tightness on the right, and thoracic inlet rotated left sidebent left.

First Treatment

Osteopathic treatment occurred at the presentation of the vertigo episode documented in Table 1.

The patient's somatic dysfunctions were treated using muscle energy, myofascial release, Still technique, counterstrain, High Velocity Low Amplitude, and Balanced Ligamentous Tension. With the patient supine, the Galbreath technique was then applied to the patient's left side without incident. The Galbreath technique was then applied to the patient's right side with immediate, significant post-nasal drainage. The amount of drainage into the oropharynx and throat made it necessary to sit the patient up due to gagging and coughing. No vertigo symptoms developed from the rapid ascent to seated position. The Galbreath technique was resumed from a seated position, and further drainage was well tolerated by the patient. No vertigo symptoms developed post-treatment. The patient tolerated the OMT session well without complication. The patient was taught Galbreath self-treatment seated and encouraged to perform it several times per day.

Treatment Course

At the follow-up visit, 4 weeks following the initial vertigo episode presentation and OMT, the patient reported no recurrent vertigo episodes. She did describe continued ear fullness and ear ringing when congested. She was trying to do the self-treatment exercises but not appreciating much success. She also reported trying to chew gum to open the ETs and help with decongestion. OMT was provided and is described in Table 2.

Table 2. Second OMT session, given 4 weeks after prior visit

System	Somatic Dysfunctions	Techniques applied
Head	OA Extended, SBIRr	ME
	Suboccipital tension, bilaterally	MFR
	Eustachian tube dysfunction, bilaterally	Galbreath Technique
Cervical	Atlantoaxial joint rotated left	ME
	C4 Flexed, RISBI	Still
	C6 Extended, RISBI	Still
Thoracic	Inlet – T1 RISBI, first rib elevated on the right	ME
Upper Extremity	Anterior right shoulder	ME

Follow-up

On telephone follow-up 8 days later, the patient reported significant improvement of ringing and muffling in the ears for 5 days and no episodes of vertigo. She reported no more drainage of the ear the day of treatment but did notice mild drainage intermittently over the next few days. After the gradual return of the muffling in the ears, the patient attempted the Galbreath self-treatment. With only short-term benefit, she expressed interest in relearning the technique.

At a follow-up visit, 4 months from the initial vertigo episode with ET dysfunction, the patient reported near resolution of issues. She did not feel she was able to perform the Galbreath technique on herself effectively and had previously discontinued. For maintenance, she continues to use a nasal saline rinse daily.

Discussion

This case demonstrates the utility of OMT in a patient with vertigo and ETD. She presented with numerous somatic dysfunctions contributing to her condition that may not have resolved without a thorough osteopathic structural exam.

In the case presentation, the Galbreath technique for her ETD produced immediate and copious post-nasal drainage. The Galbreath technique along with OMT for the additional dysfunctions produced significant improvement with the patient's vertiginous symptoms. This case provides further evidence of the utility of the Galbreath technique as an adjunctive therapy to the current

treatment regimen for ETD. Though classically performed in pediatric cases, this case suggests that this technique may be utilized effectively in patients with ETD of all ages, including adults with vertigo. This is especially true for patients who may not be surgical candidates.¹² It would be contraindicated in patients with abscesses, recent trauma and fractures to affected area, thrombotic events, leukemia, lymphoma, and chronic tympanic membrane perforation following acute otitis media.¹¹⁻¹² Limitations to this case report are that other body regions were treated with OMT, not just the Galbreath technique, so while we can infer that the Galbreath helped with the vertigo due to the immediate postnasal drainage, the other treatments could have assisted with the release. This case report is of one 73-year-old female so without more patient reports, a generalization is not possible currently. Of note, while the self-Galbreath technique was not able to be utilized effectively in this case, it can be easily taught to patients and caregivers to be utilized as needed at home to provide relief from unwanted symptoms that ETD may cause.

Conclusion

Vertigo in conjunction with other ear symptoms suggesting ETD may be successfully treated using the Galbreath technique. Using the principle that structure and function are interrelated, an osteopathic approach was applied. This case demonstrates the importance of applying osteopathic principles and approach to the treatment of patients with vertigo and the value of using critical thinking within the osteopathic framework to treat a patient.

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