

Tinnitus and mandibular condyle fractures – An unexplored relationship

Anmol Agarwal*¹, Gaurav Mittal², Ritesh Garg³, Abhishek Rathi³, Akash Bhatt⁴

¹Department of Oral and Maxillofacial Surgery, Institute of Dental Studies and Technologies, India

²Principal, Professor and Head, Department of Oral and Maxillofacial Surgery, Institute of Dental Studies and Technologies, India

³Reader, Department of Oral and Maxillofacial Surgery, Institute of Dental Studies and Technologies, India

⁴PG Student, Department of Oral and Maxillofacial Surgery, Institute of Dental Studies and Technologies, India.

***Corresponding author:** Anmol Agarwal, Professor, Department of Oral and Maxillofacial Surgery, Institute of Dental Studies and Technologies, Modinagar, Ghaziabad, Uttar Pradesh, India. Email: dranmolag@yahoo.com, Phone: +91-9704560372

Received: November 28, 2020

Published: December 15, 2020

Abstract

Tinnitus is the perception of sound for which there is no acoustic source. Although a lot has been published in the literature concerning tinnitus but there is lack of conformity with respect to its clinical management. Furthermore, understanding of pathophysiology of tinnitus remains in the stage of hypothesis and speculations.

It is believed that we all have a unique pathway of hearing mediated by various nerves like vestibulo-cochlear nerve, vagus nerve and the trigeminal nerve, which all together intercept all sought of sound in the form of vibrations and carry them to the brain where they are processed to make it meaningful. Any disruption in this pathway may lead to ringing or buzzing sensations in the ear which sometimes are quite debilitating especially during the night and result in sleep disturbances.

The present communication emphasizes on the fact that individuals sustaining mandibular condylar fractures may develop post traumatic tinnitus which need to be diagnosed well in time for early and effective management.

Keywords: Tinnitus; Ringing Ear; Trauma; Condylar Fracture

Origin and Genesis of the Article

One many experience 'Tinnitus' or simply known as ringing ear due to aging, trauma, disease and or side effects of some medication. Individual suffering from tinnitus can only explain what a day to day stressor it can be. These ringing and buzzing sensations may seem to lessen during the activities usually in the day time but at night it can be quite bothering. The physiology of hearing is unique, all signals traveling into the ear, both good and bad, are in the form of vibrational sound waves which stimulate nerves, beginning at the level of the eardrum and end in the brain nuclei where sound is processed and interpreted.

The primary nerves innervating the ear are the vestibulo-cochlear nerve, some crossover of the vagal nerve and the trigeminal nerve. Each nerve plays a role in receiving signals and relaying the signal along the chain. Any interruption in this pathway either due to trauma, arthritic changes or drugs can alter how and what type of signal gets to your brain which may lead to regular or constant 'ringing or buzzing' sensations.

Tinnitus, however can be classified in two basic categories with respect to its location: 1. Otic tinnitus that originates from the inner ear or acoustic nerve pathologies; and 2. Somatic tinnitus

that originates from the head-neck pathologies other than the ear [1]. Somatic tinnitus commonly relates to Temporomandibular Joint Disorders, either traumatic or pathological that can induce a ringing or buzzing in the ears through the trigeminal nerve. If the joint doesn't function properly, neurological processes are impaired and symptoms occur.

A lot has been studied and reported to clarify the relationship of temporo-mandibular joint disorders and tinnitus. But when it comes to the incidence of tinnitus associated specifically with mandibular condylar fractures, literature is found sparse. 'Tinnitus', an auditory sensitivity which occurs without any external stimulus, is not considered as a disease, but rather as a symptom that may occur due to plethora of causes [2-4]. Despite several attempts to describe its mechanism(s) through various theories, the pathophysiology of tinnitus has yet to be elucidated [5,6].

The author had come across three cases of mandibular condyle fractures which were treated conservatively and all of them started complaining of tinnitus couple of weeks later leading to disturbed sleep and day to day activities causing psychological trauma to the patient.

[7] Costen for the first time described the relationship between TMJ and tinnitus and suggested that posterior disposition of the mandibular condyle can cause compression of the auriculotemporal branch of the trigeminal nerve and chorda tympani branch of the facial nerve leading to dysfunction of the eustachian tube and changes in tympanic pressure, which in turn may result tinnitus, otalgia, auditory insufficiency and aural fullness. His theory very well explains the correlation of tinnitus and mandibular condyle fractures.

Many other studies tried to explain different mechanism but none succeeded to establish it. Although the management protocols remains the same as described by Dobie's (1999) [8] which includes drug as well as nondrug treatments that included psychotherapy, electrical stimulation, magnetic stimulation, ultrasound, biofeedback, acupuncture, hypnosis etc. but definitely bigger studies needs to be performed to establish the exact etiopathogenesis, prevention protocols and management of this debilitating symptom especially in patients with mandibular condylar fractures.

Conflict of Interest

None

Funding

Self

References

1. Khedr EM, et al. Epidemiological study of chronic tinnitus in Assiut, Egypt. *Neuroepidemiology* 2010; 35: 45-52.
2. Jackson JL, O'Malley PG, Kroenke K. Antidepressants and cognitive-behavioral therapy for symptom syndromes. *CNS Spect* 2006; 11: 212-222.
3. Bernhardt O, et al. Signs of temporomandibular disorders in tinnitus patients and in a population-based group of volunteers: results of the Study of Health in Pomerania. *J Oral Rehab* 2004; 31: 311-319.
4. Camparis CM, Formigoni G, Teixeira MJ, de Siqueira JT. Clinical evaluation of tinnitus in patients with sleep bruxism: prevalence and characteristics. *J Oral Rehab* 2005; 32: 808-814.
5. Vanneste S, Plazier M, Van de Heyning P, De Ridder D. Transcutaneous electrical nerve stimulation (TENS) of upper cervical nerve (C2) for the treatment of somatic tinnitus. *Exp Brain Res* 2010; 204: 283-287.
6. McCombe A, et al. British Association of Otolaryngologists Guidelines for the grading of tinnitus severity: the results of a working group commissioned by the British Association of Otolaryngologists, Head and Neck Surgeons, 1999. *Clin Otolaryngol Allied Sci* 2001; 26: 388-393.
7. Costen JB. A syndrome of ear and sinus symptoms dependent upon disturbed function of the temporomandibular joint. *Ann Otol Rhinol Laryngol* 1997; 106: 805-819.
8. Dobie, R. A. (1999). A review of randomized clinical trials in tinnitus. *The Laryngoscope*, 109, 1202-1211.