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CASE REPORT

An electromyography guided botulinum toxin injection is effective treatment for objective tinnitus as an office procedure: A case report



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Abstract Patients with palatal myoclonus may suffer from pulsatile tinnitus stemming from involuntary contractions of tensor veli palatini and levator veli palatini muscles. Botulinum toxin (BTX) injection to these muscles is effective in resolving pulsatile tinnitus symptom. We present a case of pulsatile tinnitus who was effectively treated with BTX injection under an electromyography guidance as an office procedure.

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1. Introduction

Palatal myoclonus (PM) is a rare cause of objective tinnitus, first described in 1878 by Politzer.¹ It is a rhythmic and involuntary movements of soft palatal muscles that is also defined as palatal tremor by many authors.² PM consists of two distinct clinical forms called symptomatic and essential. Symptomatic PM is thought to arise as a result of brainstem or cerebellar lesions involved the dentato-rubro-olivary pathway in the triangle of Guillain-Mollaret. The levator veli palatine muscle is mostly affected.^{3,4} Although, there is no focal neurological lesions associated with essential PM detected on imaging.^{5,6} EPM usually affects the tensor veli palatini muscle.

Tinnitus is generated by involuntary rhythmic contraction of tensor veli palatini and levator veli palatini muscles being source of an audible click. We herein present an objective tinnitus case who received BTX injections into the palatal area using electromyographic guidance for the treatment of EPM.

2. Case report

A 23-year-old woman complained of involuntary movements of palate and tinnitus in her left ear for the past four months. She denied any of the associated symptoms including hearing loss, vertigo, otalgia or prior otologic surgeries, otitis media and acoustic trauma. She had no history of systemic disease. She received a medical treatment for a month to alleviate her tinnitus, no relief obtained though. A brain magnetic resonance imaging and neurologic examination were completely normal. There were no abnormal findings on otoscopic

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examination. One was able to hear an audible click when getting approximately 5 cm close to her left ear. Also, we have seen rhythmic contractions of the soft palate roughly at a rate of 100 movements per minute. A pure tone audiogram and tympanogram presented normal hearing and impedance bilaterally. Tinnitus was masked by a white noise at 3 kHz and 67 dB. Patient was diagnosed as EPM. An electromyogram recorded regular bursts of electrical activity at firing rate 5 per 3 s (Fig. 1). We injected 2.5 U BTX type A either into the tensor veli palatini and levator veli palatini muscle unilaterally under an electromyographic guidance (Fig. 2). A monopolar, EMG recording needle is a 27 gauge and Teflon coated. The BTX was loaded into a tuberculin syringe that was attached to a EMG needle. Then, appropriate BTX type A dose was delivered into the palatal area while observing maximal electrical activity. The patient tolerated BTX injections well, without the need of local anesthetic and no side effects were observed. Tinnitus in her left ear decreased on the third day. The patient achieved complete relief of tinnitus and no involuntary movements of soft palate after two weeks. She had symptomatic relief for 4 months and then we observed a slight contraction of the left soft palate with associated tinnitus. We decided to apply a second dose of BTX type A.

3. Discussion

Essential PM is a rare cause of objective tinnitus considered to generate by involuntary movements of soft palate. The symptoms which can be seen in a wide age range including childhood onset, have been experienced mostly in middle age patients.⁷ Spontaneous remission may occur occasionally, but most of the patients need specific therapy.⁸ Essential PM usually affects the tensor veli palatini and levator veli palatini as well as the other soft palate and pharynx musculature including salpingopharyngeus, palatopharyngeus and superior pharyngeal constrictor that sometimes take a part in the clinic. Although, different treatment options have been defined including medical, and surgical, general response to these approaches is commonly poor.⁹ Similarly, surgical procedures have not widely gained any success in the treatment of EPM.

Most of the objective tinnitus cases resulting from PM, experienced complete resolution of symptoms after 1 or 2 BTX injections. To our knowledge BTX injections has been performed at a dose range between 2.5 U to 30 U for palatal myoclonus treatment in the literature.^{7,8,10} We injected the minimum effective dose of 2.5 U BTX described in the literature so as to limit the possible side effects.^{3,5,7} Injections either



Figure 1 Electromyographic pattern composed of five rhythmic bursts.



Figure 2 Unilateral injection of BTX into the tensor veli palatini and levator veli palatini muscle.

to the tensor veli palatini muscle or levator veli palatini muscle have been suggested to subside the symptoms of tinnitus and palatal movement respectively.

The average symptom free period is between 2 to 6 months in literature.⁵ In our case she achieved symptomatic relief for about four months and no side effects were observed with minimum dose described in the literature. Due to using an electromyographical guidance, we could perform the minimum dose for symptomatic relief.

4. Conclusion

Botulinum toxin injection can be used in the first line treatment for objective tinnitus from palatal myoclonus patients. BTX is safe and effective but, because of temporary effect of the toxin, we need repeated injections about every 5–6 months. We suggest that BTX injection must be done under an electromyographic guidance in order to use minimum dose for symptomatic relief and avoid side effects. Using an electromyographic guidance more effectivity can be provided with a lower dosage.

References

1. Politzer A. *Lehrbuch der Ohrenheilkunde für praktische Ärzte und Studierende*. Stuttgart: Enke; 1878.
2. Vieregge P, Klein C, Gehrking E, Körtke D, Kömpf D. The diagnosis of 'essential palatal tremor'. *Neurology*. 1997;49:248–249.
3. Seidman MD, Arenberg JG, Shirwany NA. Palatal myoclonus as a cause of objective tinnitus: a report of six cases and a review of the literature. *Ear Nose Throat J*. 1999;78(4):292–297.
4. Deuschl G, Toro C, Valls-Sole J, Zeffiro T, Zee DS, Hallett M. Symptomatic and essential palatal tremor: I. Clinical, physiological and MRI analysis. *Brain*. 1994;117(4):775–788.
5. Penney SE, Bruce IA, Saeed SR. Botulinum toxin is effective and safe for palatal tremor: a report of five cases and a review of the literature. *J Neurol*. 2006;253(7):857–860.

6. Zadikoff C, Lang AE, Klein C. The essentials of essential palatal tremor: a reappraisal of the nosology. *Brain*. 2006;129(4):832–840.
7. Sinclair CF, Gurey LE, Blitzer A. Palatal myoclonus: algorithm for management with botulinum toxin based on clinical disease characteristics. *Laryngoscope*. 2014;124:1164–1169.
8. Bryce GE, Morrison MD. Botulinum toxin treatment of essential palatal myoclonus tinnitus. *J Otolaryngol*. 1998;27:213–216.
9. Saeed SR, Brookes GB. The use of clostridium botulinum toxin in palatal myoclonus. A preliminary report. *J Laryngol Otol*. 1993;107:208–210.
10. Stidham KR, Solomon PH, Roberson JB. Evaluation of botulinum toxin A in treatment of tinnitus. *Otolaryngol Head Neck Surg*. 2005;132:883–889.