Case study

UNUSUAL PRESENTATION OF TICK IN THE EAR CAUSING VESTIBULOCOCHLEAR NERVE INVOLVEMENT: A CASE REPORT

ABSTRACT

Foreign body tick in the ear can cause facial nerve palsy due to toxins released by ticks affecting the facial nerve. Patients can come with symptoms of acute otalgia and the removal is difficult because it grips tightly to the ear canal or tympanic membrane. Other associated symptoms include symptoms of facial asymmetry, vertigo and sudden onset hearing loss if adherent to the tympanic membrane. This occurs likely due to involvement of facial nerve and vestibulocochlear nerve in view of toxins released by ticks. The involvement of vestibulocochlear nerve with foreign body ticks is rare. Herein, we report and discuss the management of a case of intra-aural tick resulting in facial nerve palsy and vertigo and sensorineural hearing loss.

Keywords: Tick, otalgia, facial palsy, vestibulocochlear nerve palsy

1. INTRODUCTION

Foreign body Ticks are ectoparasites that survive by dwelling in their host blood and are known to affect most mammals, including human beings.[1] Tick can lead to neurotoxicosis known as tick paralysis: a generalized ascending flaccid motor paralysis.[2] Ear tick infestation is the most common cause of foreign body ear in some regions.[3,4] It can present as severe otalgia, and its removal is difficult because it grips tightly to the ear canal or tympanic membrane. Intra-aural tick also can manifest as facial nerve palsy. [2,4,5] Other presentation of otoacariasis includes isolated facial palsy with sensorineural hearing loss[6] and vestibular ototoxicity.[7]

Here, we present an unusual presentation of ear tick with facial nerve involvement and vestibulocochlear nerve. In the ear can cause facial nerve palsy due to toxins released by ticks affecting the facial nerve. However, symptoms of vertigo and sudden-onset hearing loss where involvement of vestibulocochlear nerve in foreign body tick in the ear is rare.

Herein, we report and discuss the management of a case of intra-aural tick resulting in facial nerve palsy and vertigo and sensorineural hearing loss.

2. CASE REPORT

A 39-year-old Chinese lady presented to our clinic with sudden onset facial asymmetry and reduced hearing for 3 days associated with left ear discharge and otalgia. Before the event, she had visited her mother's farm and developed a sudden spinning sensation associated with vomiting. She had sought treatment from a general practitioner and was treated with ear drops and anti-emetic and her symptoms resolved after 2 days.

Clinical examination revealed left facial nerve asymmetry with lower motor neuron lesion with house Brackman grade V (Figure 1). There was inflamed posterior wall ear canal on otoscopy examination with a tick adhered to the posterior

superior part of the tympanic membrane (Figure 2). The contralateral ear, nasal and throat examination was unremarkable.

Audiological assessment was performed after removal of ticks in the ear. Pure tone audiometry showed Left mild sensorineural hearing loss and normal right ear hearing, with bilateral tympanometry type A, showing normal middle ear function. Blood parameters and infective markers were unremarkable.

She was then admitted for symptomatic treatment and facial physiotherapy. A course of tapering dose of oral prednisolone (1mg/kg) was given for 2 weeks. She was prescribed with oral prednisolone 50mg daily for 4days, then 40mg daily for 4 days, followed by 30mg daily for 3 days and 20mg daily for 3 days. No antibiotics were prescribed.

Upon review in the clinic 1 month after discharge, her symptoms astoundingly resolved. No residual facial nerve palsy and repeated hearing assessment were normal.

Figure 1: Left facial asymmetry, lower motor neuron lesion, House Brackman V

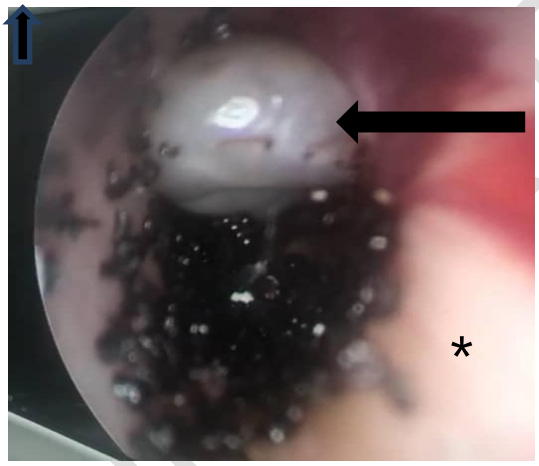

Figure 2: Otoendoscopic view of left ear showed inflamed posterior wall ear canal (asterick), tick adhered to tympanic membrane (arrow) with tick droppings

3. DISCUSSION

Ticks saliva contains different microorganisms such as viral agents, rickettsias, spirochetes and bacteria. They may release their saliva when threatened. The secretes neurotrophic and dermatotrophic toxins leading to local reactions on the patient.[8]

An intra-aural tick has been reported to cause facial nerve paralysis. [2,4,5] There were few theories postulated to describe pathophysiology of facial nerve palsy in intraaural tick. Some theories mentioned regarding axonal degeneration of facial nerve may occur following tick toxins.[4,9] Furthermore, the toxins interferes with the release or production of acetylcholine at the motor end plates of muscle fibres.[10] However, in perforated tympanic membrane, it is possible due to toxins form the tick saliva entering the middle ear and affect the facial nerve through natural dehiscence of the fallopian canal resulting in facial nerve paralysis.[9]

Sudden sensorineural hearing loss (SSHL) is an otolaryngology emergency, and its aetiology remains unclear and can be due to idiopathic in origin. However, it is essential to rule out other aetiologies of sudden-onset sensorineural hearing loss, including viral infections, cerebellopontine angle tumours, autoimmune diseases, and Meniere disease. In intra-aural tick resulting in sensorineural hearing loss may be related to neurotoxins release into the middle ear cavity to the inner ear via the round window, leading to an obstruction in the cochlea.[6]

There have been report of dizziness with facial nerve palsy in tick manifestation where they postulate that toxins or secondary edema had affected the vestibule-cochlear nerve as the same way it affects the facial nerve in previous reports.[7] However, in our case, no vestibular test was performed as the patient symptom of spinning sensation has resolved 2 days prior to first visit to our clinic.

Managing intra aural tick-related facial nerve palsy includes short course steroids to reduce inflammation, co-amoxiclav to cover secondary infections, a short course of acyclovir and anti-rickettsial antibiotics. [4] The recommended treatment for facial nerve palsy due to intra-aural tick was the use of appropriate anti-rickettsial antibiotics together with other supportive care.[4]

Other study mentioned, a short course of oral methylprednisolone 30 mg daily was given for 3 days followed by intratympanic steroid injection (12 mg/ml dexamethasone) in the left ear for 3 days resulting in resolved giddiness and improvement in facial nerve palsy.[7]

Furthermore, an accurate diagnosis with proper history, clinical examinations with early and complete removal of intraoral tick is essential to avoid complications. Failure to recognize intra aural tick may leads to continued secretion of toxin, thus further prolonging paralysis and increasing morbidity.[12]

In the present case, intra-aural tick with involvement of facial nerve and vestibulocochlear nerve, symptoms of vertigo had resolved at presentation. However, the patient presented with facial nerve palsy and hearing loss. We manage this case with oral steroids and facial physiotherapy. The outcome was good after a month with no residual facial palsy and repeated hearing assessment was normal. The usage of oral steroids was also mentioned in a case of intra-aural tick induced facial palsy and sensorineural hearing loss with no residual palsy after 1 month.[6]

4. CONCLUSION

It is necessary to be aware of such unusual presentation of tick infestation especially those with exposure to domestic animals and livestock, hiking and gardening. Intra aural tick leading to facial nerve palsy, vertigo and sudden sensorineural hearing loss is one of the differentials to be kept in mind for physicians especially in those individuals with obvious predisposition.

Disclaimer regarding Consent and Ethical Approval:

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

REFERENCES

1. Düzenli U, Bozan N, Ayral A, Yalınkılıç A, Kıroğlu AF. A honey bee can threat ear: Sudden sensorineural hearing loss. The American journal of emergency medicine. 2017 Nov 1;35(11):1788-e1.

2. Nibret A, Bulfeta N. Intra-aural tick induced facial palsy. Otolaryngology Case Reports. 2019 Nov 1;13:100132.

3. Cakabay T, Gokdogan O, Kocyigit M. Human otoacariasis: Demographic and clinical outcomes in patients with ear-canal ticks and a review of literature. Journal of otology. 2016 Sep 1;11(3):111-7.

4. Kularatne SA, Fernando R, Selvaratnam S, Narampanawa C, Weerakoon K, Wickramasinghe S, Pathirage M, Weerasinghe V, Bandara A, Rajapakse J. Intra-aural tick bite causing unilateral facial nerve palsy in 29 cases over 16 years in Kandy, Sri Lanka: is rickettsial aetiology possible?. BMC infectious diseases. 2018 Dec;18(1):1-9.

5. Patil MM, Walikar BN, Kalyanshettar SS, Patil SV. Tick induced facial palsy. Indian pediatrics. 2012 Jan 1;49(1):57-67.

6. Kütük SG. Tick-bite–Induced Sudden Sensorineural Hearing Loss and Peripheral Facial Palsy. Journal of Craniofacial Surgery. 2020 Jan 1;31(1):e26-7.

7. Retinasekharan S, Nadarajah S. Tick-induced vestibular ototoxicity and facial nerve paralysis successfully treated with intratympanic steroid injections. Indian Journal of Otology. 2020 Apr 1;26(2):112.

8. Šimo L, Kazimirova M, Richardson J, Bonnet SI. The essential role of tick salivary glands and saliva in tick feeding and pathogen transmission. Frontiers in cellular and infection microbiology. 2017 Jun 22;7:281.

9. Grattan-Smith PJ, Morris JG, Johnston HM, et al. Clinical and neurophysiological features of tickparalysis. Brain 1997; 120 (pt 11):1975–1987.

10. Indudharan R, Dharap AS, Ho TM. Intra-aural tick causing facial palsy. Lancet 1996;348:613.

11. Amin Z, Baharudin A, Shahid H, Din Suhaimi S, Nor Affendie MJ. Isolated facial palsy due to intra-aural tick (ixodoidea) infestation. Arch Orofac Sci 2007;2:51-3.

12. Pek CH, Cheong CS, Yap YL, Doggett S, Lim TC, Ong WC, et al. Rare cause of facial palsy: Case report of tick paralysis by Ixodes holocyclus imported by a patient travelling into Singapore from Australia. J Emerg Med 2016;51:e109-14.