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## Izolowane porażenie nerwu twarzowego wywołane wewnętrznym ukłuciem przez kleszcza – opis przypadku

Isolated facial nerve palsy from intra-aural tick infestation – a case report

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### Streszczenie

Liczba przypadków ukąszenia przez kleszcza zgłaszanych do poradni laryngologicznych jest wysoka, choć dokładna przyczyna tego zjawiska pozostaje nieznana. Pacjenci zazwyczaj wracają do zdrowia bez istotnych powikłań miejscowych czy układowych. Porażenie nerwu twarzowego wywołane ukłuciem przez kleszcza jest stosunkowo rzadko opisywane w literaturze. W poniższej pracy przedstawiamy nasze doświadczenia w leczeniu dziecka z izolowanym porażeniem nerwu twarzowego o opóźnionym początku, wywołanym ukłuciem przez kleszcza. Opis przypadku wskazuje na możliwość wystąpienia późnych powikłań ukąszenia w postaci porażenia nerwu, występujących kilka godzin po usunięciu pajęczaka. Ścisła obserwacja pacjenta i świadomość potencjalnych następstw ukąszeń przez kleszcze mają kluczowe znaczenie dla wykrywania potencjalnych oznak neurotoksyczności.

**Słowa kluczowe:** porażenie nerwu twarzowego, ukąszenie przez kleszcza, wewnętrzne ukłucie przez kleszcza, ucho

### Abstract

The incidence of tick infestation reported by ear-nose-throat outpatient clinics is high, though the exact reason is unknown. Affected patients generally recover well without any local or systemic sequelae. Tick-induced facial nerve palsy is less commonly reported in the literature. In this case report, we present our experience in managing a case of delayed isolated facial nerve palsy from intra-aural tick infestation in a child. The case highlights the possibility of late effects of tick paralysis occurring hours after tick removal. Close observation and awareness are crucial to detect any signs of neurotoxicity associated with tick infestation.

**Keywords:** facial nerve palsy, tick bite, intra-aural tick, ear

## INTRODUCTION

Ticks are known vectors for many infectious agents which can lead to a variety of tick-borne diseases. They range from localised cutaneous skin lesions to Lyme disease and, less commonly, tick paralysis<sup>(1)</sup>. Ticks are ectoparasites which can be categorised into two major types: hard ticks (*Ixodidae*) and soft ticks (*Argasidae*). The usual hosts for these arthropods are mammals, including livestock such as cattle and goats<sup>(2)</sup>. Domestic animals and pets are also easily infected by these ticks, which can be transmitted to humans, especially children. The phenomenon is more rampant in countries with warm and humid climates because ticks require some volume of moisture for their growth and metamorphosis, which is not available in regions with dry, cold climates.

Tick infestation of the ear canal is referred to as otocariasis. The incidence of these infestations is becoming more common, as reported by ear-nose-throat (ENT) outpatient clinics, though the exact reason is unknown. Generally, patients recover well without any local or systemic sequelae<sup>(3)</sup>. In Malaysia, the east coast region of Peninsular Malaysia has a higher incidence rate of intra-aural tick infestation than other areas<sup>(4)</sup>.

Tick-induced isolated facial nerve palsy is, however, less commonly reported in the literature.

In this case report, we present our experience in managing a case of isolated delayed facial nerve palsy from intra-aural tick infestation in a child. The case highlights the possibility of late effects of tick paralysis, occurring even hours or days after tick removal.

## CASE REPORT

A previously healthy 7-year-old girl presented to us with a 5-day history of left otalgia. There were no complaints of otorrhoea or reduced hearing. Upon examination, a tick with faeces was noted via examination under microscope. The tick was removed, and the patient was discharged with a one-week course of oral antibiotics. The following day, however, the child had sudden onset of left facial

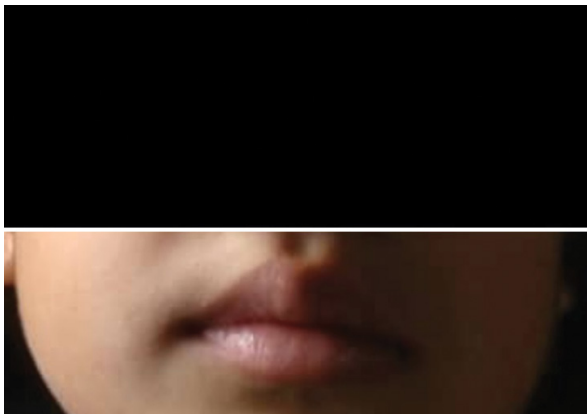


Fig. 1. Isolated left facial nerve palsy, HB grade IV

asymmetry. There was no precipitating upper respiratory tract infection. Examination revealed left lower motor neuron facial nerve palsy House–Brackmann (HB) grade IV (Fig. 1). Otoloscopic examination showed residual tick faeces which were removed immediately. Subsequently, the patient was admitted to our department and started on intravenous dexamethasone, ceftriaxone, and antibiotic ear drops with artificial eye drops. Facial physiotherapy was also initiated. Pure-tone audiometry (PTA) showed left mild to profound high-frequency mixed hearing loss which improved after a repeat hearing assessment performed three days later (Fig. 2). Facial nerve palsy resolved on day 5 after admission. The tympanic membrane healed and became normal. The patient's hearing also subsequently normalised after several weeks.

## DISCUSSION

The pathogenesis of tick bite paralysis is not related to the fact that ticks transmit infectious agents, but to the presence of neurotoxin in tick saliva which is released simultaneously with feeding. The toxin may cause respiratory or facial paralysis. Intra-aural ticks can lead to ear infections ranging from otitis externa, otitis media, and injury to the tympanic membrane to, rarely, facial nerve palsy<sup>(5)</sup>. With respect to intra-aural tick infestation, there are a few theories regarding the development of facial nerve palsy. Where the tympanic membrane is intact, one theory postulates direct extension of the inflammation to the facial canal. The process can occur either through persistent dehiscence of the facial canal or extension of the infectious tick via the middle ear, causing oedema of the facial nerve within the canal. If perforation is seen in the tympanic membrane, the likely cause for facial nerve palsy is the neurotoxin entering the middle ear through the perforation, and then extending to the facial nerve. Subsequently, the released neurotoxin

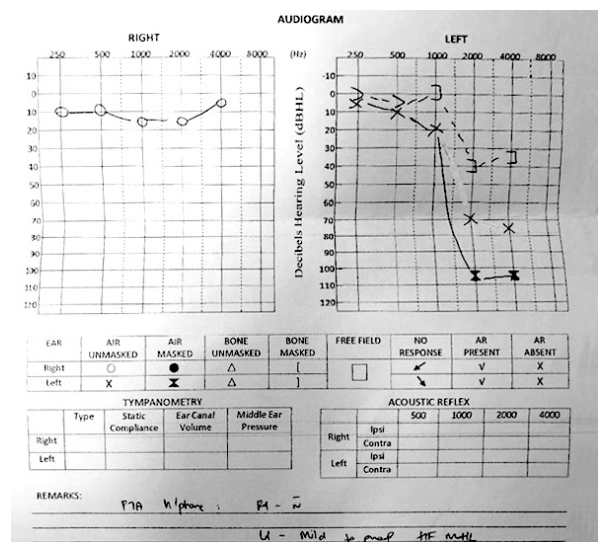


Fig. 2. PTA findings showing left mild to profound high-frequency mixed hearing loss

affects the synthesis of the neurotransmitter acetylcholine which works at the neuromuscular junctions. But it is only by a persistent release of the toxin that facial nerve palsy ensues. In fact, the resolution of facial palsy can be observed as soon as the tick is removed<sup>(6)</sup>. These theories can also account for the delay in facial nerve palsy secondary to tick infestation, as in our discussed case.

Consequently, ticks should be removed as rapidly as possible, as there is a direct link between the duration of tick bite or attachment and the effect of neurotoxin release and progressive inflammation which follows.

## CONCLUSION

Facial nerve palsy is a recognised outcome that may occur due to the spread of the tick neurotoxin. However, the palsy resolves rapidly after the tick is removed. This fact translates into a favourable outcome especially in children, in whom tick bites are more common. Close observation and awareness are crucial to detect possible signs of neurotoxicity.

### Conflict of interest

*The authors do not report any financial or personal connections with other persons or organisations which might negatively affect the content of this publication and/or claim authorship rights to this publication.*

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### Piśmiennictwo

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