

An unusual case of ear pain in a child

A previously healthy 4-year-old French boy presented to the children's emergency department complaining of left otalgia for 3 days. He had initially experienced left ear itch, which progressed to increasing sharp pain. There was no associated otorrhoea, blood-stained ear discharge or hearing loss. The child did not experience fever, chills or rigor. Prior to this episode of otalgia and ear itch, the child had visited the local reservoir, where a wild monkey had jumped onto him. There were no other encounters with wild animals. Systemic review was unremarkable.

This case report fulfilled conditions for research exemption per SingHealth Centralised Institutional Review Board Guidelines.

Physical examination. Our patient was afebrile (temperature 36.6°C) and clinically non-septic. Otoscopic examination of the right ear was normal, but the left ear revealed a greyish-white oblong foreign body on the central portion of an intact tympanic membrane (TM). This was located just inferior to the umbo, posterior to the tympanic cone of light (Fig. 1). There was associated black debris peripherally scattered on the TM. Further, a small haemorrhagic bleb was noted at the inferior annulus. There was no clinical evidence of acute otitis media, facial nerve palsy or mastoiditis.

In the primary care setting, what is the next most appropriate management option?

- A. Immediate removal of foreign body and antibiotic eardrops only
- B. Antibiotic eardrops, oral antibiotics, and review in 3 days
- C. Irrigation with antibiotic eardrops and removal of foreign body
- D. Irrigation with antibiotic eardrops, and immediate onward referral to an ear, nose and throat (ENT) specialist
- E. Immediate referral to the emergency department

Discussion. Our patient underwent successful removal of the intra-aural foreign body in the ENT clinic under microscopy. Re-examination of the ear post-extraction showed no TM perforation, residual parts or faecal material. He was prescribed empirical topical combination of neomycin and dexamethasone eardrops, and a single dose of oral doxycycline (100mg) was administered for systemic tick infection prophylaxis, in consult with

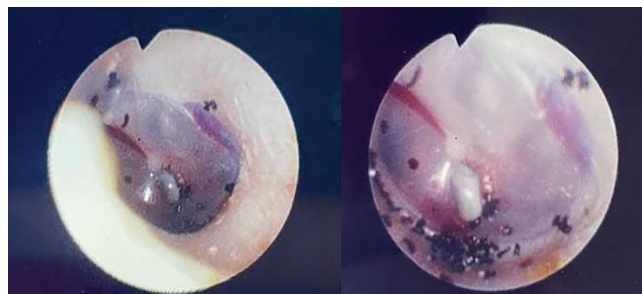


Fig. 1. Otomicroscopy of object on the left tympanic membrane.

a paediatric infectious disease specialist. Serial otomicroscopy showed progressive resolution of the haemorrhagic TM bleb, and recovery was unremarkable. Fig. 2 illustrates a microscopic image of the removed foreign body.



Fig. 2. Light microscopy pictures of foreign body removed from ear.

Human otoacariasis (tick infestation of the human ear canal) is a rare disease entity associated with exposure in rural communities, or in individuals with occupational risk exposures (e.g. livestock farming).¹ Ticks have been reported to infest warm, moist regions of human hosts including the ear, groin and axilla. Intra-aural attachment of ticks may cause otitis externa and tympanic membrane perforation. Ticks are implicated in rickettsial infections, Lyme disease and tularaemia, among other tick-borne diseases. In Southeast Asia, otoacariasis is most commonly caused by these main genera of ticks: *Amblyomma*, *Hyalomma*, *Rhipicephalus* and the subgenus *Boophilus*.²

At initial presentation, clinical features of ear itch followed by increasing pain in the absence of otorrhoea should prompt clinicians to examine carefully for an organic foreign body. Insects have been reported to cause severe florid local inflammatory reactions, which can

account for these symptoms. Otoscopy raised clinical suspicion of an insect, with black debris representing insect faeces. Immediate irrigation should be performed with antibiotic eardrops, especially if concomitant infection/inflammation is noted. Caustic or ototoxic eardrops including acetic acid and gentamicin should be avoided if there is any suspicion of TM perforation. Irrigation is useful in both killing the insect, and potentially dislodging the insect to facilitate subsequent removal.

Patients should be referred onwards to an ENT specialist for definitive extraction. Microscopic removal is mandatory, and increased care must be taken in the removal if the insect is on the TM to minimise risks of inadvertent perforation. Ticks bite forcefully onto any intra-aural contact surface. Predilection for areas of thin skin such as the TM may be explained by proximity to surface capillaries for feeding. It is essential for complete removal of the tick to be performed, as retained appendages or mouthparts may trigger a severe inflammatory response and granuloma formation, similar to tick bite dermatitis.³ As such, there is a low threshold for extraction under general anaesthesia to optimise safe and complete tick extraction.

After extraction, empirical antibiotic eardrops should be prescribed for prevention of secondary infections. The presence of intact or ruptured haemorrhagic blebs post-extraction may be expected due to a combination of surface capillary exsanguination from tick bites. Serial examination is required to evaluate for secondary otitis externa or tick larvae from unhatched eggs. To our knowledge, while the incidence of systemic tick infection developing as a result of isolated otoacariasis is unknown, full evaluation for symptoms and tick bites on the limbs, trunk, axilla and groin must be performed. Prophylaxis against systemic tick infections may be considered within 72 hours of exposure, especially if the exposure occurred in a high-risk or endemic region.^{4,5} Routine antibiotic prophylaxis may include oral doxycycline. At present, there has been no reported case of Lyme disease in Singapore. However, return advice should be rendered if the patient develops symptoms and signs of systemic tick infection (fever, myalgia, arthralgia, abdominal pain and rashes).

In our case, the tick speciation returned as an encountered species in Singapore—*Dermacentor auratus*. Wildlife exposure (e.g. to monkeys) may represent a possible transmission of tick larvae, although wild boars are the true zoonotic hosts of *D. auratus* in Singapore. *Dermacentor* ticks are indeed recognised as a re-emerging zoonotic tick species in Singapore.⁶ These zoonotic hosts (wild boars) were widespread in the 20th century until rapid urbanisation reduced the wildlife population. However, with recent shifts towards nature and forestry conservation, the local wild boar population

has increased, and with it, potential carriage of *Dermacentor* ticks.

This case of otoacariasis is the second known reported case in the last 2 years in Singapore,⁶ both of which have been attributed to *D. auratus*. In our institution, at least 4 prior cases of otoacariasis (unknown species) have been encountered in the past 5 years. More epidemiological studies are required to better pinpoint and identify high-risk areas for tick infestation. However, the public should consider routine use of permethrin or DEET containing insect repellents to safeguard against tick infections when in nature and in contact with wildlife. Primary care physicians must also recognise otoacariasis promptly and refer onwards for specialist ENT care, for further evaluation and appropriate treatment.

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