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CASE REPORT

A Unique Ear Foreign Body: A Thorny Issue

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ABSTRACT

Foreign body (FB) in the external auditory canal (EAC) is one of the most common problems encountered in otorhinolaryngology (ORL) clinics. Depending on the type of FB, it may become a medical emergency, and its removal requires skill, expertise, and appropriate instruments. We report three cases of thorny rattan shoots lodged in the ear canal, where the unique arrangement of the thorns made removal particularly challenging. In addition to mastering the removal technique, understanding the characteristics of the FB itself is essential to prevent further injury.

INTRODUCTION

In tropical countries such as Malaysia, working in lush forests and plantations may expose individuals to various types of injuries, including those involving the ear. In ORL practice, the ear is the most common site for FBs. Ear pain, bleeding, and otorrhea are the main presenting symptoms (Ponnuvelu et al., 2021; Chiun et al., 2012; Yaroko & Irfan, 2012). A neglected organic FB may lead to a local inflammatory reaction. The rattan thorn is an organic FB with a unique arrangement of barbed thorns and requires a specialized removal technique to avoid complications.

CASE SUMMARY

Case one

A 30-year-old male plantation worker

presented to our clinic with complaints of right ear pain and bleeding. He reported that a rattan shoot had accidentally lodged in his right ear while working at a palm plantation. Microscopic examination revealed a thorny shoot impacted in the right EAC (Figure 1a). Due to the downward orientation of the rattan spines (Figure 1b), the shoot was first pushed medially using crocodile forceps to disengage it from the canal wall before it could be safely extracted. Following removal, only minimal injury to the ear canal was observed, and the TM remained intact. At follow-up, no edema or inflammation of the ear canal was noted.

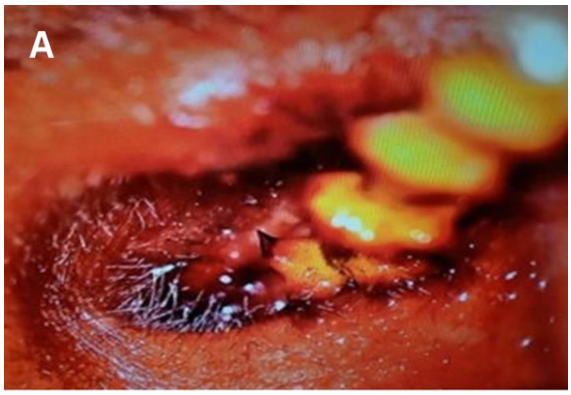

Figure 1a: Rattan shoots lodged in the right EAC.

Figure 1b: Downward spine angle of the rattan shoot (25x magnified view).

Case two

A 55-year-old male was referred from a local clinic for a FB in the right ear. He complained of right ear pain, bleeding, and reduced hearing. He reported that a rattan shoot had accidentally become embedded in his ear while he was cutting it during fishing near a riverbank. Examination revealed that the rattan shoot had penetrated deeply into the EAC, causing severe pain even with minimal manipulation (Figure 2a). Removal was performed under general anesthesia (GA) using crocodile forceps. Extra precautions were taken during extraction due to the circumferential arrangement of the thorns. Post-procedural inspection showed multiple irregular perforations of the right TM (Figure 2b). The FB measured 7 cm in length (Figure 2c). The patient was discharged with oral and topical antibiotics. At one-month follow-up, the TM perforations had completely healed.

Figure 2a: Rattan shoot stuck in the right ear canal

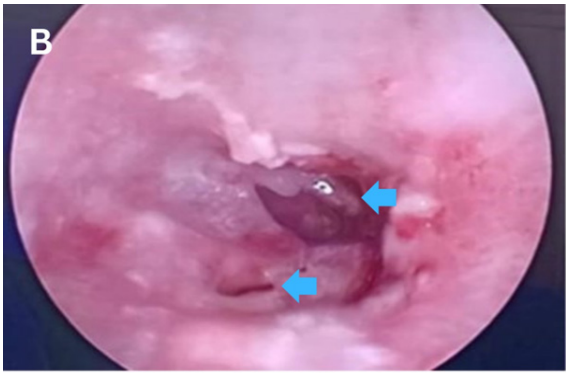

Figure 2b: Perforated TM (blue arrow) was seen after the removal

Figure 2c: 7 cm long rattan shoot after removal

Case three

A 41-year-old male presented with a two-day history of left ear pain, bleeding, and discharge. He reported that a rattan shoot had accidentally lodged in his left ear while searching for rattan in the jungle a few days prior to presentation. He attempted self-removal but managed to extract only the outer portion of the shoot. Otoscopic examination revealed a rattan twig with its spines embedded in the canal wall (Figure 3a). Removal was performed under GA using crocodile forceps. The thorny shoot had to be extracted in several pieces, as some thorns were deeply embedded in the canal wall with associated inflammation (Figure 3b). The TM was intact. Postoperatively, the patient was discharged with oral and topical antibiotics. At two-week follow-up, the ear canal appeared healthy, with no evidence of inflammation or granulation tissue.

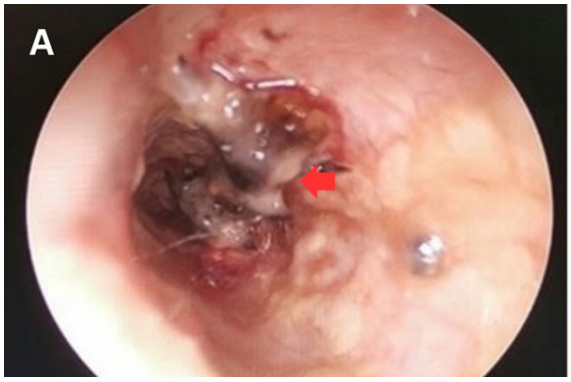

Figure 3a: A snapped fragment of rattan shoot (red arrow) after the attempt of self-removal

Figure 3b: Rattan shoot was removed in pieces

other related sites such as the nose, pharynx, oesophagus, and laryngotracheobronchial tree (Chiun et al., 2012; Ponnuvelu et al., 2021). The majority of cases occur in children, accounting for approximately 60% (Chiun et al., 2012; Yaroko & Irfan, 2012). Studies have shown that males are more frequently affected than females, with a reported ratio of 1.6:1 (Yaroko & Irfan, 2012), possibly due to their greater involvement in outdoor activities and adventurous behaviour. Table 1 showed a summary overview of all cases, including patient demographics, clinical presentation, duration of foreign body retention, complications, and management.

Ear FBs can be classified according to their nature as organic or inorganic, animate or inanimate, metallic or non-metallic, hygroscopic or non-hygroscopic, regular or

Table1: A summary table showed a structured overview of all cases, including patient demographics, clinical presentation, duration of foreign body retention, complications, and management.

Case	Age/sex	Occupation	Duration	Symptoms	Complication	Management
1	30/M	Plantation worker	2 days	Otalgia, ear bleeding	none	Removal under microscopic in clinic setting
2	55/M	Fisherman	1 day	Otalgia,ear bleeding and reduced hear-ing	TM perforation	Removal with crocodile forceps under GA
3	41/ M	Farmer	2 days	Otalgia		

DISCUSSION

The ear is the most common site of FB presentation in ORL practice compared with

irregular, and soft or hard (Ponnuvelu et al., 2021). The most commonly identified aural FBs include beads, cotton tips, insects, and paper. In adults, accidental animate FBs such

as cockroaches are more common, while inanimate FBs such as cotton wool and cotton buds are often associated with adults who have learning disabilities (Ponnuvelu et al., 2021). The most common presenting complaints are ear pain and bleeding, followed by discomfort, itchiness, discharge, tinnitus, and reduced hearing (Chiun et al., 2012; Yaroko & Irfan, 2012; Falcon-Chevere et al., 2013). Prompt management of ear FBs is essential to prevent injury to the EAC and TM.

The anatomy of the EAC makes it particularly prone to trauma from FBs, as it is a narrow, tunnel-like structure that is highly vascular and sensitive (Yaroko & Irfan, 2012). In children, the EAC is relatively straight, whereas in adults it assumes a more sigmoid shape (Falcon-Chevere et al., 2013). The canal has two anatomical constrictions: one at the bony-cartilaginous junction and another just lateral to the TM (Falcon-Chevere et al., 2013). These sites are the most common locations where FBs become impacted. In our second and third cases, the rattan thorn was lodged at one of these narrowings, making removal difficult and necessitating extraction under general anaesthesia. For better visualization during removal, backward and upward traction of the helix helps straighten the canal. Deeply located FBs or improper manipulation increase the risk of TM injury.

In this case series, we highlight an uncommon foreign body, specifically rattan shoots, which led to EAC injury.Rattan is a subspecies of the palm family, with around 600 species identified in Malaysia. It is considered one of the most unique, economically valuable, and ecologically important plants in Asia (Fadzly et al., 2014).

Palm thorn injuries are known to cause local inflammatory reactions at the site of trauma (Press & Peleg, 2016). Histologically, the surrounding tissue demonstrates a strong inflammatory response characterized by granulation tissue formation, fibroblastic proliferation, and revascularization (Press & Peleg, 2016). Rattan has a spiny structure, with spine orientation varying by species; however, most spines are directed downward toward the root (Fadzly et al., 2014). Removal of rattan shoots from narrow cavities such as the EAC is particularly challenging due to the circumferential arrangement of downward-pointing spines. In our patients, the shoot had to be pushed medially to disengage it from the EAC wall before careful manipulation and extraction. Determining the orientation of plant spines or thorns before removal is crucial to minimize pain and avoid injury to adjacent structures.

Table 2: FB removal techniques and tools in acute care setting.

Techniques	Indication	Contraindication	Tools
Irrigation	Loose small objects < 2mm	Perforated TM Seed, other vegetables matter (may swell when water added) Button battery	Otoclear, waterpick Syringe with catheter
Traction	Soft, round, smooth, non graspable	Swelling around object Impacted materials	Frazier suction, Dental tip suction, Schuknecht suction Cotton swab, Cyanoacrylate glue
Manual instruments	Wide variety objects		Alligator/ Crocodile forceps , Cup forceps Right angle hooks
Insecticidal agents	Living insects	Perforated TM	Olive oil, Sodium bicarbonate solution, Alcohol

Although our patients recovered without immediate complications, it is important to consider potential sequelae following the removal of such uncommon FBs.

Table 3: Indication for selection of patients for LA or GA at acute care setting.

Procedures	Local anaesthesia (LA)	General anaesthesia (GA)
Indications	Cooperative patients Laterally impacted FB Graspable FB No previous attempt	Uncooperative patients Medially impacted FB Failed removal under LA or in clinic settings Previous multiple attempts
Methods	Explained to patients or parents Discuss the risk and benefits Take verbal consent Prepare staff and assistants Positioning Set a limitation or attempt Removal using headlight or under microscopic guidance	Explained to patients or parents Discuss the risk and benefits Take written consent Prepare staff and assistants Anaesthetists involvements Positioning and adequate analgesic and sedation Removal using headlight, rigid endoscope or under micro-*scopic guidance*

The thorny and organic nature of rattan shoots increases the risk of local tissue reactions and delayed complications. Short- and long-term sequelae may include EAC stenosis from chronic inflammation and scarring, granuloma formation or persistent granulation tissue, recurrent otitis externa due to retained plant material, and TM perforation with consequent conductive hearing loss (Ponnuvelu et al., 2021). Additionally, chronic pain or heightened canal sensitivity may occur due to nerve irritation at the injury site.

The thorny and organic characteristics of rattan shoots predispose the EAC to both mechanical trauma and inflammatory reactions (Ponnuvelu et al., 2021). Short-term complications typically result from acute mucosal trauma or secondary infection and may include localized pain, oedema, erythema, and otorrhoea from acute otitis externa (Chiun et al., 2012; Yaroko & Irfan, 2012). When the FB is vegetative or organic, it can induce a pronounced inflammatory response, leading to early granulation tissue formation as the canal epithelium reacts to mechanical irritation and microbial contamination. Minor bleeding or ulceration may also occur after repeated or forceful removal attempts (Chiun et al., 2012; Yaroko & Irfan, 2012).

Long-term sequelae develop from persistent inflammation, retained organic material, or chronic mechanical irritation. Ongoing epithelial damage may lead to fibrosis and canal wall scarring, resulting in EAC stenosis and consequent conductive hearing loss. Chronic irritation may also cause FB granuloma formation, which can present as a polypoid mass or recurrent otorrhoea (Yaroko & Irfan, 2012; Chiun et al., 2012; Wongwan et al., 2024). Occasionally, an FB in the inflamed EAC can act as a nidus of infection, triggering granuloma formation that may extend into nearby structures, including the middle and inner ear, or even intracranial spaces, leading to tissue destruction (Wongwan et al., 2024). Therefore, complete removal under adequate visualization, minimization of trauma, and close post-removal surveillance are essential to prevent these complications.

A thorough assessment of the patient before FB removal is crucial, taking into account the type, size, and location of the FB, as well as possible TM injury (Ponnuvelu et al., 2021; Yaroko & Irfan, 2012; Falcon-Chevere et al., 2013). This evaluation guides the selection of the appropriate removal technique and instruments. Several methods are commonly used in ORL practice, including the use of alligator forceps, right-angle hooks, cup forceps, Schuknecht foreign body suctions, and warm-water irrigation (Curry & Maxwell, 2023; Ponnuvelu et al., 2021). Various FB removal techniques and instruments used in the acute care setting are summarized in Table 2. The use of local anaesthesia may

improve patient comfort and reduce pain during the procedure. In most cases, FBs can be successfully removed in the clinic; however, removal under general anaesthesia is required in certain situations, such as in uncooperative patients, those with low pain tolerance, or complicated cases involving deeply lodged FBs or middle ear involvement (Curry & Maxwell, 2023; Ponnuvelu et al., 2021). The algorithm for determining suitability for local or general anaesthesia is presented in Table 3.

CONCLUSION

Proper manoeuvre and appropriate instrument use allow for the safe and uncomplicated removal of rattan shoots from the ear. The unique thorn arrangement of rattan plants necessitates specific techniques and delicate handling. In addition to a thorough understanding of ear anatomy, clinicians must also be familiar with the structural characteristics of the FB itself. Attempted removal by untrained personnel may lead to complications such as traumatic TM injury or further impaction of the FB. Early referral to an otorhinolaryngologist for difficult cases is strongly recommended to prevent additional harm.

ETHICS STATEMENT

Verbal consents from all patients was obtained for publication.

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