

# Chronic Discharging Ear in A Child: Are We Missing Something?

Mainak Dutta, MS\*, Soumya Ghatak, MS\*\*, Gautam Biswas, MS\*\*\*

\*Department of Otorhinolaryngology and Head-Neck Surgery, Medical College and Hospital, 88, College Street, Kolkata, 700073, West Bengal, India, \*\*Department of Otorhinolaryngology and Head-Neck Surgery, R. G. Kar Medical College and Hospital, 1, Khudiram Bose Sarani, Kolkata, 700004, West Bengal, India, \*\*\*Department of Otorhinolaryngology and Head-Neck Surgery, Murshidabad Medical College and Hospital, Berhampore, Murshidabad, West Bengal, India

### SUMMARY

Chronic discharging ear, mostly due to middle or external ear infection, is one of the leading causes for seeking healthcare among the paediatric population in a developing country. However, a long-standing forgotten middle ear foreign body forms a rare cause for such presentation demanding a high index of suspicion from the clinicians. Most of them are iatrogenic or accidental, and are removed by conventional permeal approach; need for tympanotomy is rarely documented in the recent literature. We report the first case where a large stone was introduced into the middle ear through a pre-existing tympanic membrane perforation by the child himself, and only the second documentation of removal of a middle ear foreign body by tympanotomy in a child.

### KEY WORDS:

Middle ear; foreign body; children; tympanotomy

### INTRODUCTION

The inherent inquisitiveness of children about their surroundings and the natural body orifices make them vulnerable to foreign bodies. Regarding the ear, while most foreign bodies are lodged in the external auditory canal, it is rare for the middle ear to harbour any foreign object. Such situations often invite complications and pose a challenge for the clinicians. A chronic discharging ear in a child therefore may have an unusual aetiology if not suspected, and thus mandates a thorough and careful clinical work-up.

### CASE REPORT

A 9-year-old boy presented with complaints of blood-stained discharge from his right ear for the last 10 days, and associated decreased hearing. He hailed from a poor family, and seemed to have only rudimentary knowledge of hygiene. On examination, the aural discharge was mucopurulent and malodorous. Dry mopping could only partially clean the external auditory canal, and there was evident active discharge from a possibly perforated tympanic membrane. Tuning fork tests showed conductive hearing loss in the affected ear. He was afebrile, without mastoid tenderness or any palpable cervical lymph node. We put him on topical as well as systemic antibiotics, and advised to get reviewed 3 weeks later.

In the subsequent visit we found that the aural discharge had subsided; otoscopy revealed a dry ear with a moderate-sized central perforation in the right tympanic membrane. Pure tone audiogram showed an air-bone gap of 30 decibel in the right ear. On detailed history-taking it was found that the child suffered from intermittent aural discharge since 4 years which subsided with over-the-counter topical ear-drop preparations. However, there were acute exacerbations with increased frequency for the last 7-8 months. At this point, he also disclosed the introduction of a stone-piece almost 8 months back, the fact he suppressed from his parents for fear of being scolded. It was known that in an attempt to remove it by himself, the stone was pushed further in, and he was too afraid to report this to his parents. However, the subsequent period following this incident was asymptomatic, and he became oblivious of the entire episode.

The provisional diagnosis of an uncomplicated chronic suppurative otitis media (CSOM) had therefore needed to be modified to exacerbation of a pre-existing CSOM secondary to a suspected foreign object retained in the middle ear. During oto-endoscopic examination, a brownish object could be appreciated through the perforation in the partially healed tympanic membrane, embedded in the oedematous middle ear mucosa, though its dimensions could not be ascertained [Fig. 1]. Subsequent CT scan of the right temporal bone revealed a radio-dense object (~ 1500 HU), about 9 mm x 4.5 mm, occupying most of the middle ear including the hypotympanum [Fig. 2]. It seemed from the clinico-radiological profile that such a large object would not be possible to be removed through the moderate-sized perforation. No additional information could be extracted from examination under the microscope. Hence, a middle ear exploration under general anaesthesia was planned.

Peroperatively, we irrigated the ear canal thoroughly with 0.9% normal saline. A Jobson-Horne's probe introduced through the perforation could feel the foreign object, but it was impacted, and as anticipated, was quite large to be removed via the permeal route. The middle ear space was approached through the post-aural incision and after elevating the tympanomeatal flap, a large sandstone could be seen occupying the hypotympanum and most of the mesotympanum. Bony canalplasty had to be done to visualize the stone properly that was found to be surrounded by thickened oedematous mucosa and granulations [Fig. 3a]. The ossicular chain was intact. The stone was carefully

This article was accepted: 17 January 2013

Corresponding Author: Mainak Dutta, Department of Otorhinolaryngology and Head-Neck Surgery, Medical College and Hospital, 88, College Street, Kolkata, 700073, West Bengal, India Email: [duttamainak@yahoo.com](mailto:duttamainak@yahoo.com)

**Table I: Documented non-iatrogenic middle ear foreign bodies removed by tympanotomy**

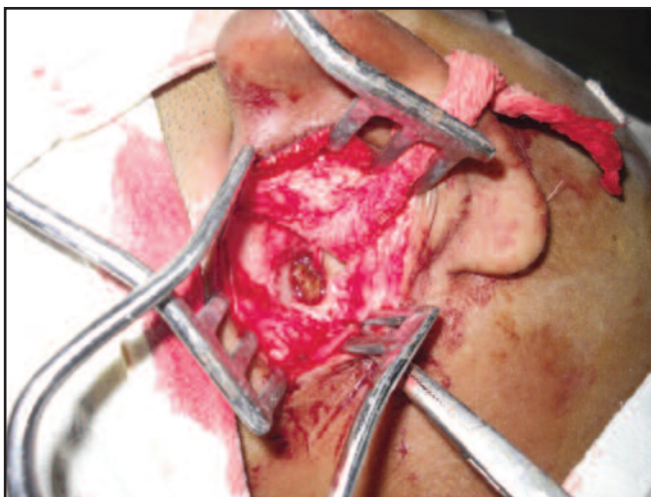
| Authors                                 | Title  | Citations  | Age (in years) & sex |
|---|--|--|----------------------|
| Kojima H. et al [5]                     | Penetrating vestibular injury due to a twig entering via the external auditory meatus                            | Am J Otolaryngol 2006; 27(6): 418-21               | 11; male             |
| Tono T. et al                           | Middle ear cholesteatoma caused by cannonball foreign bodies impacted in the bony eustachian tube: a case report | Nippon Jibiinkoka Gakkai Kaiho 1996; 99(5): 669-74 | 76; male             |
| Iseh K. R. et al [1]                    | Ear foreign bodies: Observations on the clinical profile in Sokoto, Nigeria                                      | Ann Afr Med 2008; 7(1): 18-23                      | Adult; female        |
| Fernando de Andrade Quintanilha Ribeiro | Foreign body in the Eustachian tube - case presentation and technique used for removal                           | Rev Bras Otorrinolaringol 2008; 74(1): 137-42      | 50; male             |



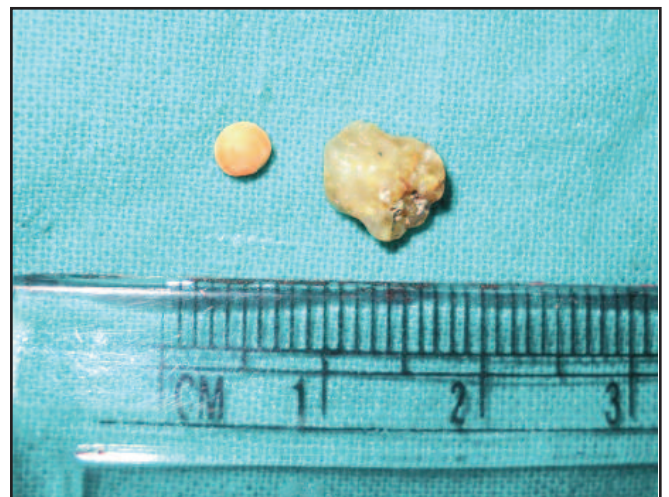
**Fig. 1 :** The oto-endoscopic view shows the impression of the foreign body in the middle ear through the perforation and the partially healed tympanic membrane.



**Fig. 2 :** The CT scan (coronal section) shows the radio-dense object occupying the entire hypotympanum and most of the mesotympanum (FB = foreign body).



**Fig. 3A :** The stone can be seen occupying the middle ear which has been well exposed by drilling following a post-aural incision.



**Fig. 3B :** The stone can be seen after retrieval. It measured about 9 x 4.5 mm, and its size has been compared to a pulse seed.

dislodged before being taken out by a curved needle. It measured nearly 9 mm x 4.5 mm [Fig. 3b]. The middle ear was repeatedly irrigated after adequate removal of unhealthy mucosa. We decided to postpone the tympanic membrane repair till the infection was controlled and mucosal oedema and granulations subsided.

The postoperative period was satisfactory. The child was put on adequate antibiotic coverage and he, along with his parents were counselled regarding aural hygiene and to keep away from vulnerable objects. The ear was maintained discharge-free, and we performed a formal myringoplasty 4 months later. He has been followed up for the next 8 months with rewarding outcomes: a disease-free ear with a neotympanum.

## DISCUSSION

Aural foreign bodies which include anything other than cerumen<sup>1</sup> constitute a sizable portion of otorhinolaryngology emergencies. Questions may be raised whether they are true emergencies (except for vegetative foreign bodies, live insects and button batteries), as many are found to reside in the external auditory canal asymptomatic for long periods, general clinical notions favour their removal at the earliest. Though nearly 80% of the aural foreign bodies are removed by the emergency department staff, this should ideally be done by trained personnel to prevent possible complications like lacerations of the external auditory canal skin, or injury to the tympanic membrane or the ossicular chain. In fact, they can get dislodged medially and become impacted in the middle ear cleft<sup>1</sup>, though such situations are very uncommon in practice<sup>2</sup>.

A thorough review of the recent literature suggests very few instances of foreign bodies in the middle ear, and those were mostly iatrogenic or accidental. Iatrogenic causes include inadvertent injury by hearing aid moulds, medially displaced grommets causing middle or inner ear complications, or cochlear implants acting as foreign bodies. Reports of inadvertent entry of metal during welding constitute the bulk of the recent literature that describes documented accidental lodgment of foreign bodies in the middle ear<sup>2-3</sup>. Besides, sustained intrinsic middle ear cleft pathology like eustachian tube dysfunction and middle ear hypoventilation may ultimately result in formation of cholesterol granuloma – a foreign body response to the cholesterol crystals.

Apart from the welding incidents, accidental entry of foreign bodies in the middle ear cleft is uncommon or appears grossly underreported. There are isolated reports of entry of twig in the middle ear piercing the tympanic membrane and causing injury to the chorda tympani and inner ear resulting in dysgeusia and tinnitus in a 16-year-old boy<sup>4</sup> and a similar case in an 11-year-old boy<sup>5</sup> producing immediate-onset vertigo and hearing loss, apart from live insects in children or meconium-induced otitis media in neonates. On the contrary, deliberate entry of objects in the external auditory canal is common; one study in Nigeria states that almost 70% of ear foreign bodies are deliberate, either self-induced or introduced by peers<sup>1</sup>. However, a self-induced foreign body in the middle ear through a pre-existing perforation in the

tympanic membrane has not been documented before in the recent literature.

The child in our case had blood-stained aural discharge as the presenting complaint, and gave history of recurrent attacks of ear discharge much before the incidence of foreign body insertion – in the period following which the severity and frequency had only increased. Subsequent work-up confirmed the presence of a self-introduced foreign body in the middle ear – a sandstone – that had to be removed by tympanotomy through post-auricular incision under general anaesthesia.

Foreign bodies in the external auditory canal can be removed by forceps, probe or by syringing, occasionally under an operating microscope, and rarely by a post-aural incision. Meticulous suction clearance under an operating microscope is an ideal option instead of routine syringing procedure in the out-patients' department when dealing with an actively discharging ear or when a perforation in the tympanic membrane is suspected. Middle ear foreign bodies are also removed by common instruments via the permeal approach. In fact, about 99.5% of aural foreign bodies in the Nigerian study were successfully removed by these conventional methods irrespective of their positions in the external or middle ear, and only 1 adult person required posterior tympanotomy<sup>1</sup>. The need for exploratory tympanotomy for extraction of non-iatrogenic middle ear foreign body in children is rarely reported, like the one in case of the 11-year-old boy<sup>5</sup>. There are only 4 instances of extraction of non-iatrogenic middle ear foreign body by tympanotomy documented in the recent literature [Table I], only one of them being a child. A thorough search in the PubMed/MEDLINE and HighWire archives with keywords foreign body, middle ear, children and tympanotomy revealed only one instance of removal of middle ear foreign body by tympanotomy in children<sup>5</sup>. There was another documented case similar to this where a twig had entered the middle ear through the tympanic membrane in a 16-year-old boy<sup>4</sup>, causing damage to the ossicular chain and severing the chorda, but it was successfully removed without requiring a tympanotomy. Cases of accidental entry of metal-pieces during welding are all reported in adults.

Thus, our case forms only the second documentation of removal of an impacted, non-iatrogenic middle ear foreign body by tympanotomy in children, and the first such case where the child had himself introduced the object into the middle ear through a pre-existing tympanic membrane perforation.

There are few other points that make this case worth presenting. The stone measured almost 9 mm x 4.5 mm, perhaps the largest ever foreign body reported in the middle ear of a child till date; this is in relation to the fact that the adult middle ear cavity measures about 15 mm in both anteroposterior and vertical planes, and ranges from 2–6 mm from the tympanic membrane and promontory. And it had been there for as long as 8 months, producing frequent exacerbations of a pre-existing CSOM, but without causing any complications therefrom. There was no nerve palsy, any tinnitus or vertigo, and no ossicular injury, though at surgery

we found the stone covered with thick granulations occupying most of the middle ear cavity. His only presentation was the blood-stained ear discharge and mild hearing loss.

#### CONCLUSION

- Middle ear foreign bodies are uncommon, which are mostly iatrogenic or accidental. Accidental introduction of foreign bodies are generally due to welding injuries in adults.
- This is the first case of self-introduction of foreign body in the middle ear in a child through a pre-existing tympanic membrane perforation.
- Most of the middle ear foreign bodies are removed by conventional, permeal approach which may require general anaesthesia and specialized instruments. Need for tympanotomy is rarely encountered.
- The aetiology of an indolent, chronic discharging ear in the paediatric population should be explored with caution, maintaining a low threshold of suspicion.

#### REFERENCES

1. Iseh KR, Yahaya M. Ear foreign bodies: Observations on the clinical profile in Sokoto, Nigeria. *Annals of African Medicine* 2008; 7(1): 18-23.
2. Eleftheriadou A, Chalastras T, Kyrmizakis D, Sfetsos S, Dagalakakis K, Kandiloros D. Metallic Foreign Body in Middle Ear: an unusual cause of hearing loss. *Head & Face Medicine* 2007; 3:23 doi: 10.1186/1746-160X-3-23. <http://www.head-face-med.com/content/3/1/23>.
3. Mertens J, Bubmann M, Reker U. Welding spark injuries of the ear. Observations of personal case material. *Laryngorhinootologie* 1991; 70(8): 405-8.
4. Brian N, Jamie S, David DG. "I Can't Taste Ice Cream": An Unusual Case of Tinnitus and Dysgeusia. *Pediatr Emerg Care* 2004; 20(12): 832-4.
5. Kojima H, Tanaka Y, Mori E, Uchimizu H, Moriyama H. Penetrating vestibular injury due to a twig entering via the external auditory meatus. *Am J Otolaryngol* 2006; 27(6): 418-21.