# Difficult Case of Middle Ear Foreign Body: An Unusual case report with review of literature

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## Abstract

**Introduction:** Foreign bodies in the external auditory canal are very common in children, mostly farm seeds and small stones in farmer. Removal of the foreign body Ear requires skill, and also high accuracy. Failures and traumatic removals often cause lifelong deafness and discharging ear. We report a case of a child who accidentally inserted a stone in ear while playing in farm and two casual removal trials pushed it into the middle ear. **Case Presentation:** A 4-year-old girl Patient was brought to tertiary care hospital attached with medical college two day after the insertion of foreign body with complaints of severe earache, something present in the ear and history of bleeding from the ear. History of two failed removal attempts in last forty eight hours at two different clinics was present with one attempt under general anaesthesia. We found that the tympanic membrane was ruptured, with granulation tissue in the middle ear and there were multiple lacerations in ear canal and oedema causing severe narrowing .No foreign body was visualised. Further on a CT scan examination stone was located in the middle ear and lodging itself in the hypo tympanum crossing the bony annulus. The foreign body was removed via a post-auricular approach after removal of overlying granulation tissue and widening of ear canal with use of micro motor mastoid drill. The perforated drum was repaired in the primary surgery after inspection of the ossicular chain and middle ear using a temporalis fascia graft. **Conclusion:** Removal of a foreign body from external auditory canal is an essential skill for emergency care giver as well as otolaryngologists. This particular case focuses the need of utmost carefulness and care in treating such seemingly simple cases. Slightest of error can give the patient lifelong deafness and prolonged morbidity. Whenever possible, primary reconstruction of the ear drum should be done in the same sitting.


**Keywords:** Stone, foreign body, middle ear, auditory canal. Hypo tympanum

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## Introduction

Foreign bodies in the external auditory canal are very common in children mostly farm seeds and small stones in this part of the world because of agriculture economy and large number of farmer population. They are most often encountered in children aged between 2 and 8 years[1.] Removal of the foreign body requires skill, and also highest level of professionalism and accuracy as failures and traumatic removals often cause lifelong deafness and discharging ear.

Different middle ear conditions and other factors such as have been identified leading to foreign body insertion in the ear such as child's desire to explore orifices, fun making, mental retardation, and sibling inserting foreign objects in their younger brothers or sisters while playing. This seemingly simple cases could lead to a significant morbidity in form of discharging ears and lifelong loss of hearing that may require a costly management if not appropriately managed[2,3] .Beads, cotton tips, insects, eraser, stone, slate pen and paper are the commonly found foreign bodies[4,5] but incidence of farm seeds and small stones is very high in our geographic region. The true incidence is difficult to evaluate. An association between the foreign bodies in external auditory canal and middle ear pathology e.g. middle ear effusion, Eustachian tube dysfunction is reported [6-8]. The most common complications of a foreign body in the ear are bleeding, ear discharge and otitis externa [9] mostly with neglected organic foreign bodies with delayed presentation to the clinics. Removal of a foreign body is usually performed successfully in the emergency department[10,11.] More over so if the foreign body is in the outer canal and has not crossed the isthmus. Foreign body removal by an inexperienced physician or without proper setup to remove, tend to have a higher incidence of iatrogenic complications; like perforation of the tympanic membrane[12-14]. We report a case of a child who accidentally inserted a stone in ear while playing in the farm and casual removal trials pushed it into the middle ear.

## Case Presentation

A 4-year-old girl was taken to a private otolaryngology clinic for having complains of something inserted in ear while playing in the farm. Primary examination revealed foreign body in his external auditory canal. The first attempt to remove the foreign body failed The

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physician reported that he could not remove the foreign body and prescribed antibiotics and analgesics and the parents took the child another otolaryngology clinic after almost twenty four hours of the first attempt . Again a trial of removing foreign body through the natural external canal did not succeeded. Subsequently, the child was referred to our medical college hospital two day after the insertion of foreign body with complaints of severe earache, something present in the ear and history of bleeding from the ear. On arrival, her vital signs were stable (Fig-1). On otoscopic examination, we found that his external auditory canal was lacerated and swollen. We could not identify the foreign body. A subsequent HRCT of the temporal bone showed a foreign body in the right middle ear (Fig - 2) measuring 6.3 mm × 6.2 mm × 6.0 mm.

The child underwent foreign body removal under general anaesthesia. We found that the tympanic membrane was ruptured, with granulation tissue in the middle ear and there was stone located in the middle ear and lodging itself in the hypo tympanum crossing the bony annulus. We carefully removed the granulation tissue for adequate visualisation by operating microscope and found that the tympanic membrane was ruptured, there was granulation tissue in the middle ear and a stone was located in the hypo tympanum. We tried to remove the foreign body by a trans-meatal approached but the external auditory canal was severely narrowed by the inflammation, so we changed to a post-auricular approach. Using this technique, it was still difficult to deliver foreign body. Posterior bony meatal wall was drilled using micro motor mastoid drill. So that space available for delivering the foreign body and was successfully removed (fig -3&4). Subsequently whole of the middle ear and the ossicles were inspected and primary repair of ear drum using temporalis facia graft was done. The patient was discharged the next day without any complications (fig-5). We prescribed oral amoxicillin- clavalunate and oral analgesics for week. At two weeks after removal, the post-auricular wound was healed.

## Discussion

A foreign body in the external auditory canal is a common condition in children, but few case reports of foreign bodies in the middle ear in this age group have been published. Reports of

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various foreign bodies are there in literature right from ear mould impression materials[15] to live insect as foreign body in the middle ear[16].

Clinical presentations of foreign bodies can be anywhere from asymptomatic, self reported, to severe otalgia, fullness, hearing loss, tinnitus and intermittent otorrhoea in chronic cases. Physical examination in delayed cases usually reveals inflammation of the external auditory canal, debris, granulation tissue and perforation of the tympanic membrane[17,18] in cases of organic foreign bodies like seeds, insects etc. In some cases, a lodged foreign body may be seen through the perforated tympanic membrane. Sharp foreign bodies like pencil tips and match sticks tend to perforate the membrane [17] .radio Imaging studies like a plain x-ray and in difficult cases a CT scan are helpful in evaluating the nature and location of a foreign body in the middle ear [15,17,18]. Foreign body in the external auditory canal needs a proper setup and also the primary care giver should have the expertise to perform the removal. Many reports have found that removal of foreign bodies by non-ENT personnel are significantly associated with complications and emphasize that difficult or all cases should be managed by an otolaryngologist [19,20]. The successful removal depends highly on the following four factors first is the type of foreign bodies, secondly the patient's co-operation, third important factor is the proper setup including instruments and lighting e.g. headlamps to endoscope and microscope and last and the most important is the experience and skills of the surgeon [21.] Uncooperative patients and patients with history of previous trials should be taken for removal in general anaesthesia especially in children as removal without general anaesthesia leads to higher complication rate [19.] Although reports of numerous studies suggest less than 1 % rates of major surgical procedure [22,23] to be performed for removal of foreign bodies. Many of the chronic otitis media cases in adults we see in our centre have a childhood history of foreign body insertion and removal .It is very difficult to establish a direct correlation of trauma at the removal attempt or by foreign body itself. we feel that it is one of the important causes of discharging ear in adulthood An unsuccessful attempt to remove a foreign body may cause further trauma and complications, e.g. foreign body in the middle ear. In our case, lack of co-operation by the young

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patient and failure to assess the size and site of foreign body was a significant factor in the failure as both the previous attempts were done by otolaryngologists. After failure of the first attempt at removal, the external auditory canal usually becomes oedematous and infected, making otoscopic examination afterwards difficult. Emphasis should be placed on removing the foreign body in first attempt by a competent person with a proper setup[24]. CT scan of temporal bone is of value when trying to locate an opaque foreign body and is useful, when planning treatment including the primary repair of hearing mechanism. We suggest that a antibiotic and steroid impregnated soft wick in the ear canal lateral to foreign body should be placed to reduce the oedema and surrounding granulation tissue although great care has to be taken not to disturb the foreign body. This is particularly useful when a second or later attempt is being done to remove the foreign body.

## Conclusion

Foreign body removals from external auditory canals are an essential skill for primary care physicians and otolaryngologists. Seemingly simple cases of this kind can cause significant morbidity and a loss of special function that is hearing, sometimes permanently, if Careful removal is not pursued. When the first attempt fails, referral to an otolaryngologist is recommended and should be attempted preferably in general anaesthesia along with proper imaging studies at hand. Also whenever possible the primary reconstruction should be done.

## Consent

Approval was sought from the Ethics Committee for Human Research of C.U.Shah Medical College before initiating the study and informed consent was obtained from the patient and her parent for publication of this case report and accompanying images of the patient.

## Competing Interests

The authors declare that they have no competing interests.

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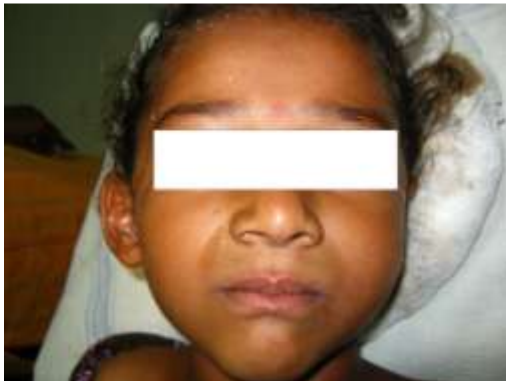
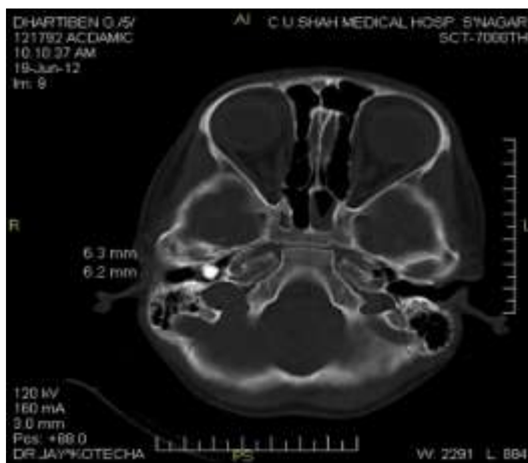
**At the time of admission:-**



**Removal Foreign body and its size**

CT scan report:-




**After operation:-**