EAR & NOSE FOREIGN BODIES – DO NO HARM

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OBJECTIVES

• Review normal ear canal and nasal cavity anatomy.
• Identify ear and nose foreign bodies.
• Determine best technique to remove foreign body.
• Learn what to do if foreign body cannot be removed easily.
• Identify when it is urgent to remove foreign body.
EXTERNAL AUDITORY CANAL (EAC) ANATOMY

The EAC is comprised of 2 parts – the cartilaginous and bony segments.

Upon entering the canal, the anterior and lower walls are cartilaginous (the superior and back wall are more fibrous).

The skin is thicker in this segment and the subcutaneous tissue functions as padding – including the modified apocrine glands (which produce cerumen), sebaceous glands and hair follicles.

The most distal portion of the canal is a continuation of the cartilage framework of the pinna/auricle.
• The canal is almost entirely cartilaginous except for the tympanic ring (also known as the annulus)

• As the child grows, and the EAC becomes less cartilaginous and more bony.

• The inner bony segment has thinner skin which is tightly attached to the underlying periosteum and is free of hair.

• The narrowest part of the EAC is at the bony-cartilaginous junction is known as the isthmus.

• Attempts to remove the foreign body may push it further into the canal and lodge/impact it at this narrow point, increasing the difficulty for removal.
BLOOD SUPPLY OF THE EAC

- Superior temporal a.
- Anterior auricular aa.
- Posterior auricular artery
- External Carotid Artery

supply the posterior aspect of the canal

supply the anterior aspect of the canal
NERVE SUPPLY OF THE EAC

The EAC is innervated by the following nerves:

CN V – Trigeminal (V3/mandibular branch)

CN VII – Facial

CN IX – Glossopharyngeal

CN X – Vagal-auricular branch (also known as Arnold’s branch and is associated with cough reflex)

Cervical nerves 2 & 3
EAR FOREIGN BODIES
HOW DO THEY TYPICALLY PRESENT?

1. Sometimes, the child will report that they put something in the ear canal or the parent will see the child put something in the ear

2. Often, this is an incidental finding on WCE/asymptomatic

3. Complaints of ear pain or a sense of ear fullness or blockage – as might be associated with an ear infection (AOM) or repeated ear pulling/poking is noted

4. Otorrhea (ear drainage)

5. Failed hearing screen/hearing loss
CLASSIFICATION: ORGANIC VS NON-ORGANIC AND THEN GRASPABLE VS NON-GRASPABLE

1. Organic – Beans, popcorn kernels, seeds, bugs
2. Non-Organic – Plastic toys, beads, pebbles, foam, batteries
3. Graspable – Paper, foam, stickers, cotton, some toy pieces
4. Non-graspable – Beads, popcorn kernels, pebbles
EAR FOREIGN BODIES
NOW, HOW AM I GOING TO REMOVE IT?

Before You Begin:

• Check other orifices – if there is something in one ear, there can be something in the other ear and the nose

• Get yourself and other preparations ready

• Remember your resources: EC/ED/ER, ENT Clinic – OR
FIRST TIME, BEST TIME

Remember that the tympanic membrane could be damaged by pushing the foreign body further into the canal or by the instruments that are used during removal attempts.

Keys to Successful Foreign Body

- Adequate visualization
- Having the appropriate equipment
- “Cooperative” patient
- Skilled provider
PREPARATION

• **Position:** Papoose and assistants

• **External Light Source:** Otoscope (removable lens), Headlight, Bionix Lighted Curette, Microscope

• **Tools:** Irrigation, Ear Curette, Alligator Forceps, Suction, Wire Loops, Right Angles

• *No KATZ Extractor in the EAC, please!*
**REMOVAL OF FOREIGN BODY**

**Irrigation**

- **MIGHT be okay for NON-organic FBs:** use warm water (+H2O2) in a 20-50cc syringe with flexible catheter tubing tip.

- **Contraindicated with organic FBs or batteries and if TM cannot be seen or could be perforated TM, FB is organic matter or alkaline battery**

**Mechanical Methods**

- **Good for organic and non-organic FBs:** Alligator or other type of forcep, wire loop, suction or right angle
DO NOT IRRIGATE
INDICATIONS FOR URGENT/EMERGENT ENT REFERRAL

• History of previous ear surgery or known tympanic membrane (TM) perforation.

• Contact of the foreign body with the TM or incomplete visualization of the auditory canal/TM.

• External ear or pre-auricular edema or inflammation

• Button batteries or hearing aid batteries are time-sensitive items secondary to liquefaction necrosis that may lead to subsequent tympanic membrane perforation and further complications. In fact, irrigation should never be attempted as it accelerates the necrotic process.
ADVANTAGES OF THE EAR EVALUATION AT ENT
WHAT IF I CAN’T REMOVE IT?

First, do no harm

If not successful:

- Referral to ENT
- Office or OR
FOREIGN BODIES – NASAL CAVITY
NASAL CAVITY ANATOMY

The nose consists of two nasal fossae separated by a vertical septum and subdivided into three passages by the nasal turbinates. Nasal foreign bodies tend to be located on the floor of the nasal passage, just below the inferior turbinate, or in the upper nasal fossa anterior to the middle turbinate.
BLOOD SUPPLY TO THE NASAL CAVITY

Sphenopalatine artery
NERVE SUPPLY TO THE NASAL CAVITY

**Olfaction (Smell):** is carried by olfactory nerves that ascend from olfactory mucous membrane through cribriform plate of ethmoid to olfactory bulbs.

**General sensation** is carried by branches of the ophthalmic & maxillary divisions of trigeminal nerve.
NASAL CAVITY FOREIGN BODIES: HOW DO THEY TYPICALLY PRESENT?

1. Sometimes, the child will report that they put something in their nose or the parent will see them put something in the nose

2. Complaints of nasal congestion or a “sinus” infection but classically only involves unilateral rhinorrhea from the affected side and a BAD odor

3. This is less likely, but may be an incidental finding on WCE / asymptomatic presentation
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NOW, HOW AM I GOING TO REMOVE IT?

- Balloon catheters/Katz extractor:
  - Works best for smooth, round or hard objects
  - May first lubricate catheter w/ lidocaine jelly
  - Advance catheter past object → inflate balloon and rapidly withdraw catheter
- Other removal options: alligator forceps, suction catheter, nasal or oral positive pressure
- Do NOT irrigate as this may push FB posteriorly into nasopharynx
- Do NOT use drops if FB is a battery
THE PARENT’S KISS – NASAL/ORAL POSITIVE PRESSURE (COACHED NOSE BLOWING)
REMOVAL OF NASAL FB-KATZ EXTRACTOR

[Images of the steps involved in the removal process]
PREPARATION FOR MECHANICAL REMOVAL OF NASAL FB

• Before foreign body removal, nasal decongestant like oxymetazoline (Afrin) or 0.5% phenylephrine (Neo-Synephrine) can be used to reduce mucosal edema (may also decrease bleeding risk) – recommend placing to bilateral nasal cavities

• Topical lidocaine may be applied to provide analgesia

• Nasal saline application and suctioning of nasal secretions for better visualization may be necessary
NASAL FB COMPLICATIONS

- Bleeding
- Infection
- Septal perforation/Ulceration
- Aspiration of FB

- Batteries may cause nasal septum perforation, nasal mucosa burns, or nasal meatal stenosis
WHEN IS IT URGENT?

• Suspicion of battery
• Pain out of proportion to exam
• Peri-nasal signs of inflammation/infection
• Other oddities (Eg, bilateral magnets)
WHAT IF I CAN’T REMOVE IT?

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FOREIGN BODIES OF THE PINNA

• FBs of the pinna are typically related to earrings – the back or the whole earring becomes embedded in the lobe.

• Contact dermatitis to the metal alloy or gold-plated earring, poor hygiene and constant pressure caused by fixing clips create local swelling at the piercing site.

• Skin ischemia and inflammation may develop along with penetration of a portion of the earring.

• Occurs most commonly in girls under the age of 10 years.

• Presentation is typically with ear pain, swelling, redness or drainage from the piercing site. The earring may be palpable but doing so often is associated with pain.

• Plain radiograph can confirm diagnosis if metallic, but plastic backs will not be seen.

• Piercing through the cartilage may lead to infection, perichondritis and permanent disfigurement.
• Clean the ear with povidone iodine solution/chlorhexidine.
• Apply posterior pressure to the decorative front of the earring. Clamp a hemostat to the backing to disengage by pulling the clip posteriorly while holding the earring anteriorly.
• Potential of infection when cartilaginous portion of the pinna is associated with an infection by Pseudomonas aeruginosa or methicillin-resistant Staphylococcus aureus and oral fluoroquinolones (levofloxacin), if old enough, or parenteral antibiotics (vancomycin or clindamycin and ceftazidime).
• Cartilage necrosis and cosmetic disfigurement may result.
• Auricular branch of the vagus nerve (Arnold’s branch of the CN X – cough).
• Apply 1% Lidocaine (mepivacaine, bupivacaine or procaine) without Epi and wait ~5 minutes for onset of analgesia.
REFERENCES


STEVEN W. HEIM, MD, MSPH, and KAREN L. MAUGHAN, MD, University of Virginia School of Medicine, Charlottesville, Virginia, Am Fam Physician. 2007 Oct 15;76(8):1185-1189.
