

VIDEOS IN CLINICAL MEDICINE

Diagnosing Otitis Media — Otoscopy and Cerumen Removal

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OVERVIEW

Otitis media is a general term for middle-ear inflammation and may be classified clinically as either acute otitis media or otitis media with effusion. In both conditions, decreased mobility and opacification of the tympanic membrane are present. In general, acute otitis media is diagnosed when the tympanic membrane is bulging, and otitis media with effusion is diagnosed when the tympanic membrane is in a neutral position or is retracted (Fig. 1). Mastery of otoscopic examination techniques is necessary to accurately diagnose otitis media and differentiate its forms.¹

INDICATIONS

Otoscopic examination is obligatory in children who have an upper respiratory tract infection, who exhibit unaccustomed tugging of the ears, or who have irritability, difficulty sleeping, fever, otalgia, otorrhea, or hearing loss.

EQUIPMENT

An otoscope with either a surgical or a diagnostic head that has a bright light source and a movable lens is required. Cerumen removal is most readily accomplished with the use of an otoscope that has a surgical head, but a diagnostic head may also be used. Also useful are an appropriately sized blunt ear curette (no smaller than size 0) and an applicator with a nonserrated, triangular tip (Fig. 2). Metal curettes are preferable to plastic — the rigid and delicate loop on a metal curette allows for finer dissection.

PROPER POSITIONING

Older children and cooperative younger children can be examined in the sitting position, either on a parent's lap or on the examination table. Uncooperative children are best examined while recumbent, in either the prone or the supine position. The head should be firmly immobilized by an assistant. A second assistant, usually the parent, braces the child's body against the examination table. Depending on the child's position, one of the assistants must also firmly hold the child's hands.

CERUMEN REMOVAL

With the child immobilized and the child's head secured by an assistant, use your dominant hand to insert the otoscope into the external auditory canal. Once the otoscope is in the proper position, use your nondominant hand to hold it in place. Position or partially displace the lens of the otoscope and, using your dominant hand, carefully insert the blunt ear curette through the speculum and into the external auditory canal. Under direct visualization, advance the loop of the curette around and behind the bolus or flake of cerumen and scoop it out, being careful

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N Engl J Med 2010;362:e62.

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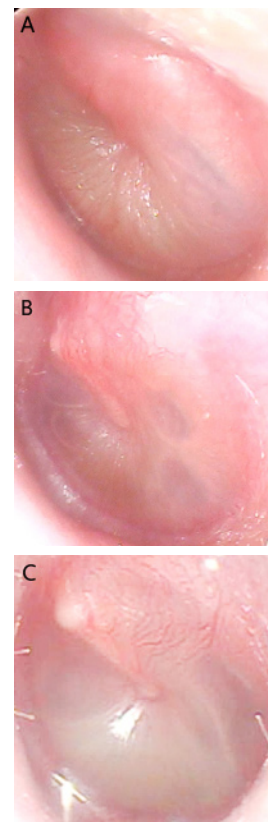


Figure 1. Tympanic Membrane — Bulging (Panel A), Neutral (Panel B), and Retracted (Panel C).

not to traumatize the wall of the external auditory canal or the tympanic membrane. If small amounts of cerumen remain and continue to obstruct your view of the tympanic membrane, tightly wrap the triangular tip of the applicator with a wisp of dry or alcohol-soaked cotton to create a dry or wet “mop.” Gently insert the applicator approximately 0.5 cm into the canal and twist it to wipe away the remaining cerumen. This method can also be used to clear otorrhea in children with acute otitis media who have a ruptured tympanic membrane. Do not grip the curette or the applicator too tightly between your thumb and forefinger; if the child’s head happens to move despite the assistant’s best efforts, the instrument should slide between your fingers rather than striking the child’s ear canal or tympanic membrane. Alternatively, in older children, irrigation may be preferable, especially if the cerumen is impacted or adherent. A metal ear syringe, or a large plastic syringe connected to butterfly tubing, is filled with lukewarm water and used to flush the external auditory canal. Cold water should be avoided, since it is uncomfortable and may cause nystagmus. Patience and gentleness are essential for successful completion of the procedure.

PNEUMATIC OTOSCOPY

Assess the position of the tympanic membrane by visualizing the manubrium and the short process of the malleus. When the tympanic membrane is in the neutral position, the manubrium and the short process are clearly visible. When the tympanic membrane is bulging, the short process is not visible and the tympanic membrane appears convex (Fig. 1). When the tympanic membrane is retracted, the manubrium appears foreshortened and the short process becomes prominent.

Next, assess the translucency of the tympanic membrane. A translucent tympanic membrane has a ground-glass appearance and allows visualization of the underlying middle-ear structures. When middle-ear effusion is present, the tympanic membrane appears opaque and visualization of middle-ear landmarks is impaired.

Assess the color of the tympanic membrane, which can be affected by underlying middle-ear effusion. An amber color usually indicates the presence of otitis media with effusion. White or yellow discoloration may be seen in both acute otitis media and otitis media with effusion. Look for areas of intense erythema, which in the absence of trauma generally indicates underlying acute inflammation. When present along with opacification and bulging of the tympanic membrane, this finding supports the diagnosis of acute otitis media. Mild erythema and injection of the tympanic membrane are nonspecific findings.

Finally, after selecting an otoscope with a diagnostic head, assess the mobility of the tympanic membrane. The largest speculum that fits comfortably into the external auditory canal should be used. A common mistake is to use a speculum that is too small relative to the diameter of the canal. For very large canals, soft-tipped speculums may be needed. To ensure that there are no leaks in the system, squeeze the rubber bulb and then place your finger firmly on the tip of the speculum. If there are no leaks, the bulb will remain deflated until you remove your finger.

To assess mobility, first insert the otoscope applying no pressure on the bulb. Then depress the bulb gently to generate positive pressure and observe the degree of movement of the tympanic membrane away from you. To create negative pressure, insert the otoscope with the bulb partially depressed. Release the bulb, and observe the degree of movement of the tympanic membrane toward you. Normally, the tympanic membrane will move briskly in each direction. When middle-ear effusion is present, as in acute otitis media or otitis media with effusion,

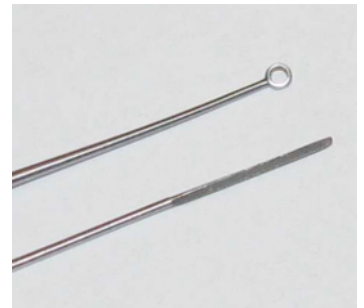


Figure 2. Blunt Curette and Applicator with Triangular Tip.

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mobility in each direction is usually decreased or absent. The occurrence of impaired mobility in response to positive pressure and normal mobility in response to negative pressure is seen when the tympanic membrane is retracted and suggests the presence of negative pressure in the middle ear, a common and usually nonpathological condition in young children.

SUMMARY

Proper performance of pneumatic otoscopy is critical to the accurate diagnosis of acute otitis media and otitis media with effusion. To provide optimal care for children, clinicians should master the techniques required for accurate determination of the presence or absence of these frequently occurring conditions.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.