Ear, nose and throat examination

Examination of the ear

This includes an assessment of hearing as well as the appearance of the ear.

History [1]

The following issues should be included:

- Classic symptoms of ear disease: deafness, tinnitus, discharge (otorrhoea), pain (otalgia), fullness of the ear, vertigo, dizziness and unsteadiness.
- Associated symptoms: fever, nausea, vomiting, headache.
- Previous ear surgery
- Previous head injury.
- Family history of deafness.
- Systemic disease (eg, stroke, multiple sclerosis, cardiovascular disease).
- Ototoxic drugs (antibiotics (eg, gentamicin), diuretics, cytotoxics).
- Sustained exposure to noise or sudden very loud exposure (eg, pneumatic drill or shooting).
- History of atopy and allergy.
- Neurological symptoms.

Inspecting the external ear [2]

Inspect the external ear before examination with an otoscope. Swab any discharge and remove any wax. Look for obvious signs of abnormality.

- Size and shape of the pinna.
- Extra cartilage tags/pre-auricular sinuses or pits.
- Signs of trauma to the pinna.
- Suspicious skin lesions on the pinna, including neoplasia.
- Skin conditions of the pinna and external canal.
- Infection/inflammation of the external ear canal, with discharge.
- Signs/scars of previous surgery.
- Obvious masses or lymph node enlargements.

Palpation

Assess size, position and tenderness of enlarged lymph nodes if present.

If acute otalgia is reported, move the pinna and press the tragus prior to performing otoscopy; this is typically painful in otitis externa, but is not in otitis media. Also look behind the ear; post-auricular fluctuant tenderness is suggestive of mastoiditis in a subject presenting with fever and ear pain.

Inspecting the ear canal and eardrum

An electric otoscope with its own magnification gives a good view of the tympanic membrane (TM).

The examination technique involves grasping the pinna and pulling it up and backwards (posteriorly and superiorly), to straighten the ear canal for inspection of the TM. (In infants, only pull the pinna posteriorly not superiorly for examination.)

Hold the otoscope near to the eyepiece rather than at the end; this helps to reduce the patient's discomfort due to hand movements, which are exaggerated in the ear. Otoscopes use disposable speculums.

It is necessary to fit the correct size of speculum to achieve the best view; it is tempting to use a small piece for ease of insertion, but this simply restricts the image available. Generally, small speculums should be reserved for children or those with narrow ear canals.

Note the condition of the canal skin, and the presence of wax, foreign tissue, or discharge. The mobility of the eardrum can be evaluated using a pneumatic speculum, which attaches to the otoscope. The drum should move on squeezing the balloon.

Inspecting the tympanic membrane[2]

Move the otoscope in order to see several different views of the drum; it is not always possible to see the whole drum in one single view using an otoscope. The drum is roughly circular (~1 cm in diameter). In a normal drum the following structures can be identified:

- Handle / lateral process of the malleus.
- Umbo - the attachment of the malleus to the centre of the TM.
- Light reflex / cone of light.
- Pars tensa and pars flaccida (attic).

Occasionally, in a healthy, thin drum, it is possible to see the following:

- Long process of incus.
- Chorda tympani.
- Eustachian opening.
- Promontory of the cochlea.

Common pathological conditions related to the ear include:

- Perforations (note size, site and position).
- Tympanosclerosis, particularly with a history of grommet insertion or recurrent middle ear infections.
- Glue ear/middle-ear effusion.
- Retractions of the drum.
- Haemotympanum (blood in the middle ear).

Check facial nerve function if any ear pathology is identified.

Basic hearing tests[2]

Detailed hearing tests are usually performed in audiology clinics.

A patient with normal hearing should hear equally as well in both ears.

- Tuning fork tests: Weber's test and Rinne's test. Perform with a 512 Hz tuning fork:

    - Weber 's test - this is performed in conjunction with Rinne's test. The vibrating fork is struck against a padded surface or the ball of the hand. The vibrating fork is then placed in the middle of the forehead for 4 seconds. The patient is asked where the tone is heard - centrally or towards the right or left. If sound is heard centrally this suggests symmetrical hearing. If heard in the affected ear, this is suggestive of conductive hearing loss. And if heard in the unaffected ear, this suggests an asymmetric sensorineural hearing loss
    - Rinne's test - strike a tuning fork against the examiners knee or elbow. Hold it vertically with its nearest prong about 1 cm away from the patient's external auditory meatus. Then immediately transfer it to the mastoid process and hold it firmly there (applying counter pressure to the opposite side of the head) for two seconds. The patient is asked to report on which of the two positions was the louder. Normally, the patient should hear the air conduction better than the bone conduction (ie first position better than the second). This is a positive Rinne's test. If the Rinne's test is positive and there is hearing impairment, it is a sensorineural and not a conductive problem. If there is a negative Rinne's test with hearing loss, then the problem is a conductive one.

Examination of the nose[2]

Full nose examinations assess the function, airway resistance and occasionally sense of smell. It includes looking into the mouth and pharynx. Common symptoms of nasal disease include:

- Airway obstruction.
- Rhinorrhoea (runny nose).

- Sneezing.
- Loss of smell (anosmia).
- Facial pain caused by sinusitis.
- Snoring (associated with nasal obstruction).

History

The following issues should be covered:

- Allergies/atopic disease.
- Smoking.
- Pets at home.
- Occupation.
- History of previous nasal surgery.
- Previous trauma.
- General medical history.
- Seasonal or daily variation in symptoms.

Inspection of the nose

First look at the external nose. Ask the patient to remove any glasses. Look at the nose from the front and side for any signs of the following:

- Size and shape.
- Obvious deformity: a deviated nose is often best looked at from above.
- Swelling.
- Scars or abnormal creases.
- Redness (evidence of skin disease).
- Discharge or crusting.
- Offensive smell.

The nose can be inspected from the front to examine the anterior nares by lifting the tip of the nose up and looking inside without a speculum. Check patency of each side and ask the patient to sniff.

To assess the nasal airway hold a cold metal tongue compressor under the nose while the patient exhales and note the condensation under both nostrils, or occlude one nostril whilst the patient sniffs to give a reasonable idea of airway patency.

Most otolaryngologists now use endoscopy to undertake further examination. However, the traditional method of head mirror or illuminated spectacles with a Thudichum speculum to open up the nose, allows examination of the nasal cavity with excellent specificity and is more suited to primary care. Holding the instrument comfortably can take practice at first. Insert the Thudichum speculum gently, and identify the nasal septum medially; turbines laterally; inferior turbinate (nearly always possible to see); and the middle turbinate - often difficult to see as it is small.

Check for inflammation (rhinitis), position of the septum, and presence of polyps (touch to check sensitivity; it should be insensitive to touch).

In secondary care, a flexible nasal endoscope is used to view the nasopharynx (the postnasal space, which contains the Eustachian tube orifices and pharyngeal recess and may contain adenoids or nasopharyngeal cancer).

Finally, examine the palate. Look for large nasal polyps and tumours arising from the soft palate.

Examination of the throat[2]

This includes a thorough examination of the oral cavity.

History

Ask about:

- Sore throat.
- Odynophagia (pain on swallowing).
- Dysphagia (difficulty swallowing).

- Hoarseness and changes in voice quality.
- Halitosis.
- Mouth breathing, snoring or sleep disturbances.
- Trismus (spasm of the jaw muscles).

Inspection

Ask the patient to remove any dentures, and examine their mouth systemically (use a bright torch): tongue, hard and soft palate, tonsillar fossa, gingivolabial / gingivobuccal sulci, floor of mouth / undersurface of tongue as follows:

- Examine the mouth and note the condition of the tongue.
- Examine back of tongue and tonsils (press down on the tongue with a tongue depressor).
- Assess the general quality of the dentition.
- Palpate the base of the tongue (look for tumours that may not be easily visible).
- Inspect the uvula and soft palate.
- Inspect the hard palate (ask the patient to tip their head backwards, until the whole hard palate is visible).
- Examine the buccal area and the gingivolabial (gingivobuccal) sulcus (the space between cheek and gums).
- Examine the floor of the mouth, check for submandibular duct stones or masses (ask the patient to stick their tongue out).
- Examine the nasopharynx and larynx with a mirror or flexible fibreoptic nasendoscope.

Further reading

- Hogan CJ, Tadi P; Ear Examination. StatPearls, Jan 2024.
- Turner JS JR; An Overview of the Head and Neck

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