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OTORRHEA: EVERYTHING A DOCTOR AND PATIENT NEED TO KNOW

Resume.

Otorrhea is discharge from the external auditory canal. Although the pathology is allocated to a separate nosology in the International Classification of Diseases, X revision (code H92.1), it should not be considered as an independent disease, but rather as a symptom indicating a possible pathological process in the ear or adjacent structures. The discharge may have a liquid or thick consistency, contain blood impurities. Purulent discharge is usually white or yellowish in colour; they indicate the presence of infection.

But is otorrhea always a symptom of pathology? In some cases, discharge from the ear is physiological in nature and does not pose a danger to human health. The secretion of earwax is a natural process; it is produced by special ceruminous glands, the main functions of which are:

- protection and lubrication - sulfur softens the skin of the ear canal, preventing it from drying out and cracking;
- removal of foreign bodies — the viscous consistency of sulfur helps to trap dust, hair, insects and other small particles, preventing their further movement through the ear canal;
- antibacterial properties — earwax has a slightly acidic environment (pH about 6), which prevents the reproduction of pathogenic microorganisms.

Keywords: otorrhea, causes, diagnostics, treatment.

Otorrhea — a symptom of the presence or leakage of discharge from the ear — is a common symptom of ear diseases. Discharges can be earwax, blood, pus, mucus, cerebrospinal fluid, or even saliva. The cause of otorrhea can be established in most cases after a history and examination of the patient. Patients with otorrhea are mostly outpatients and do not require inpatient treatment.

Where to start?

A thorough interview and history are very important elements in determining the cause of otorrhea.

Common causes of otorrhea include:

1. Otitis externa
2. Acute otitis media (perforating or with otorrhea from a ventilation shunt)
3. Chronic otitis media (with or without cholesteatoma)

4. Foreign object

5. Granulating myringitis

6. Otolymphoma

It is important to ask about the onset of otorrhea, the characteristics of the discharge from the ear (color, odor), and the duration of otorrhea. Also, find out about possible accompanying otological symptoms — otalgia, ear itching, unpleasant odor of discharge, hearing loss, tinnitus, dizziness, facial nerve paresis, swelling in the periauricular area. A history of ear trauma, ear surgery, foreign objects in the ear, use of hearing aids or in-canal earphones should be asked. A general history (including immunodeficiencies or diabetes) and an allergy history are also important. The questioning alone can outline the likely causes of otorrhea (Table 1).

Table 1

Rapid diagnosis	
Features of otorrhea	More likely diagnosis
Acute otorrhea after ear pain	Acute otitis media Acute external otitis
Discharge from the ear with an unpleasant odor	External otitis Chronic otitis media
History of acute ear trauma	Otolyorrhea Typhoid rupture
Combined meningeal symptoms	Otitis media with intracranial complications
Combined ear itching	External otitis
Otorrhea + pain	External otitis

External otitis

External otitis (EO) is an inflammation of the skin of the external auditory canal. Acute external otitis (AEO) is divided into localized and diffuse. Localized AEO (furuncle of the external auditory canal) is an infection of the hair follicle of the skin of the external auditory canal. Diffuse EO can be acute or chronic. As usual, it is associated with risk factors and has a wide range of causes (bacteria - often, fungi - rarely), chronic exposure to adverse environmental factors or allergens, or the patient has concomitant general skin diseases (for example, seborrheic dermatitis).

Acute external otitis

Up to 10% of the population suffers from AEO during their lifetime. Symptoms typically develop within 48 hours (Table 2).

Otorrhea is not an obligatory symptom of AEO; typical symptoms include ear pain (otalgia), which is aggravated by movements of the lower jaw (talking, chewing), or pain in the periauricular area (regional lymphadenitis).

Discharge from the ear is mostly purulent, sometimes mucous; it may have an unpleasant odor. The feeling of ear congestion and hearing loss in AEO are associated with concomitant skin edema and complete blockage and discharge from the external auditory canal.

If AEO occurs with simultaneous sudden relief of previous ear pain, this suggests a spontaneous rupture of the external auditory canal (localized AEO). However, the same situation is in acute otitis media after spontaneous perforation of the eardrum, so differentiation should be made on the basis of otoscopy.

Table 2

Typical manifestations of AEO

1.	Pain when pressing on the tragus of the ear or when manipulating the auricle
2.	If otoscopy is possible (sometimes impossible due to severe pain during examination of the ear), then the skin of the eardrum is swollen and hyperemic (locally or totally)
3.	The eardrum may be hyperemic, but not thickened and does not protrude
4.	No perforation of the eardrum
5.	Possible enlargement and tenderness of the preauricular lymph node
6.	The detection of a boil clearly indicates localized AEO

Treatment of localized AEO

Mostly localized AEO has a mild course and tends to heal on its own. Systemic analgesics are usually sufficient. If the boil causes severe pain, surgical debridement may be necessary. If the top of the boil is visible, it can be opened with a disposable syringe needle. Systemic antibiotics are rarely needed. If oral antibiotics are ineffective or if purulent inflammation spreads to the periauricular areas, the patient should be referred for inpatient treatment.

Treatment of diffuse AEO

All patients are advised to keep the ear clean and dry, and to take systemic analgesics if there is associated pain. They should also be advised to avoid risk factors: trauma (including the use of cotton swabs), water ingress into the ears (covering the ear canal with cotton wool moistened with oil; avoiding swimming pools for 7–10 days), and limiting circumstances that provoke increased sweating (high humidity, high ambient temperature, physical activity). If water gets into the ear, it should be dried, for example, with a hair dryer. It should be recommended to change to new ear tips for

hearing aids, headphones, earrings; it is necessary to abandon the use of local ear medications that could be an allergen/irritant for the skin of the ear canal.

Since up to 98% of cases of otitis media have a bacterial cause, antibiotic ear drops should be prescribed in all cases of otitis media. Antibacterial drops are prescribed for a period of 7 to 14 days. It is best to choose drops that also contain a corticosteroid, because AEO is usually accompanied by skin inflammation, swelling and narrowing of the ENT. If treatment is ineffective or there is a relapse, then a swab of the ear discharge should be taken for flora (including fungi) and their sensitivity.

Topical ear drops must have an acidic pH, the use of topical medications (without systemic ones) is usually sufficient, and the duration of treatment should be at least 7 days. The American Academy of Otolaryngology recommends that an aminoglycoside and a corticosteroid be used for the treatment of EO. German guidelines recommend neomycin and polymyxin B for the treatment of EO. Neither the American nor the German guidelines recommend the use of chloramphenicol, beclomethasone, lidocaine or clotrimazole.

The most modern recommendations for ear drops for the treatment of EO are met by the drug Polydexa - an original fixed combination containing neomycin, polymyxin B and dexamethasone. The drug has a pronounced antibacterial activity, a powerful anti-inflammatory effect and a high safety profile, which makes it possible to prescribe it to children from birth. Polydexa has an acidic pH, which inhibits the growth of pathogens (bacteria or fungi).

The treatment regimen for EO with Polydexa is as follows:

- dosage for adults - 1–5 drops in the affected ear 2 times a day;
- dosage for children - 1–2 drops in the affected ear 2 times a day.

Blocked ENT in AEO

Severe edema of the ENT skin may prevent the ingress of drops and requires the introduction of gauze

turundas saturated with medication by an otolaryngologist. The doctor cleanses the ENT of pathological contents and inserts the turunda with medication; the patient must remove the turunda independently after 4 hours. Rinsing the ear in AEO is prohibited, as it can cause the spread of infection, the development of necrotizing ENT or trauma to the eardrum, especially in elderly patients, immunocompromised or diabetic patients.

Chronic external otitis

Otorrhea is a rare symptom of *chronic external otitis (CEO)*. Manifestations of CEO are listed in Table 3. Fungal infection of the ENT is a consequence of prolonged use of topical antibacterial or corticosteroid drugs, which changes the flora of the ENT, contributing to mycosis. Common causes of CEO are constant exposure to irritants or allergens; it is also known that seborrheic dermatitis, eczema or psoriasis can also lead to CEO.

Table 3.

Objective and subjective manifestations of CEO (with modifications)

Feeling	Symptoms
Subjectively	Constant or frequent itching in the ear
	Otorrhoea is rare or absent at all
	Pain or discomfort is easily expressed or absent
Objectively	Discomfort during manipulations in the gastrointestinal tract
	Skin changes (seborrheic dermatitis, psoriasis) around the ear or in other areas of the skin are possible
	Changes in the ENT in CEO range from mild hyperemia of the skin to severe stenosis
	There may be lichenification (hypertrophic proliferation of the skin)
	Massive or single layers of desquamated epidermis
	A small amount of earwax
	Manifestations of fungal damage — white layers in candidiasis, black or yellow plaques in aspergillosis

Treatment of CEO

Initially, treatment should begin with local medications. The general advice is the same as for AEO (Table 4). In eczema complicated by bacterial infection, local drops with an antibiotic and a corticosteroid are indicated. Here, it is best to prescribe Polydexa - original European ear drops containing neomycin, polymyxin B and dexamethasone. The composition of Polydexa corresponds to the most modern European and American recommendations for the treatment of external otitis. In

case of a pronounced allergic reaction (severe swelling of the skin of the external auditory canal and/or auricle), systemic corticosteroids should be included for several days and an allergy test should be prescribed. If a fungal infection is confirmed, local 1% clotrimazole should be prescribed.

If the cause is unknown, you can start with a local corticosteroid. If the reaction is insufficient, then add an antifungal drug.

Table 4.

General principles of treatment of external otitis

Elements of treatment	Indication
Avoidance of water in the ear	All external otitis
Topical drugs	All external otitis
Cleansing of pathological contents	Chronic, recurrent external otitis
Systemic drugs	Severe external otitis

Necrotizing otitis externa

Necrotizing otitis externa (NEO) is an aggressive infection of the external auditory canal with a high mortality rate, which mainly affects the elderly, immunocompromised patients or diabetics. Infection with external auditory canal spreads rapidly to the mastoid process, temporal bone and skull base with the development of osteomyelitis, and meningitis may also

occur. NEO should be suspected if patients in the specified risk group have otitis media and fever over 39 degrees C. Extremely severe pain, more pronounced at night, may also suggest that the patient does not have ordinary otitis, but NEO.

Typical for NEO is severe pain in the ear, head, manifestations of damage to surrounding structures (in particular, facial nerve paresis, dizziness, sensorineural

hearing loss). Examination reveals granulation tissue at the junction of the bony and cartilaginous parts of the external auditory canal, as well as exposed bone in the bony part of the external auditory canal — these are clear evidence of NED, although these findings are not required for diagnosis. Despite rapid and effective treatment, mortality is relatively high and is 15%.

Acute otitis media

Acute otitis media (AOM) is a middle ear infection that occurs mainly in children and rarely in adults. It can be caused by a virus and/or bacteria. It most often occurs in children under 4 years of age, and 90% of children have at least one episode of AOM by the age of 2; the disease is characterized by seasonality (more often in the cold season). Sometimes spontaneous otorrhea occurs with AOM. If a tympanostomy (ventilation) shunt is present in the nasal cavity, otorrhea also occurs (mainly in primary rhinosinusitis), then the diagnosis is “AOM with otorrhea from a ventilation shunt”.

Manifestations

If otorrhea occurs with AOM, it is a consequence of spontaneous perforation of the nasal cavity; when otorrhea appears, the ear pain quickly subsides. Discharge from the ear in AOM never has an unpleasant odor, this is an important differential sign of otorrhea in AOM from otorrhea in CEO or chronic otitis media.

Treatment

In AOM with spontaneous otorrhea, systemic oral antibiotics are mandatory. Local antibacterial treatment with drugs without ototoxic properties is also prescribed. In such a situation, Otofa, the original ear drops that contain rifamycin (an antibiotic without ototoxic properties), can be prescribed. Indications for hospitalization in AOM:

- Severe general condition of the patient
- Presence or suspicion of otogenic complications (e.g., mastoiditis meningitis, brain abscess, sigmoid sinus thrombosis, or facial nerve palsy)
- All children under 6 months of age with fever greater than 38° C

Chronic otitis media without cholesteatoma

If AOM leads to perforation of the tympanic membrane, and in the future there will be periodic otorrhea and persistent perforation of the tympanic membrane persists between episodes of otorrhea, then chronic otitis media (COM) occurs. Discharge from the ear is purulent, periodic, mostly without an unpleasant odor, after treatment and the disappearance of otorrhea, persistent perforation of the tympanic membrane persists for a long time.

Such a patient should be referred to an ENT specialist for further examination and determination of indications for surgical treatment. In the presence of double perforation of the tympanic membrane, the diagnostic search should be directed towards tuberculous otitis media, Wegener's granulomatosis or syphilis. Rifamycin (the active ingredient of Otofa ear drops) has high activity against the causative agent of tuberculous otitis media.

Treatment of COM without cholesteatoma during active otorrhea consists of prescribing systemic antibiotics for 7–10 days (based on the results of culture and sensitivity), as well as local antibiotic drops.

The best drug for this is the original Otofa ear drops, which contain rifamycin. Rifamycin exhibits antimicrobial activity against most gram-positive and gram-negative microorganisms that cause infectious and inflammatory diseases of the middle ear. Rifamycin does not have an ototoxic effect both when applied locally and systemically.

The only original rifamycin for local use is Otofa. The scheme of use of Otofa is as follows:

- dosage for adults - 5 drops in the affected ear 2 times a day;
- dosage for children - 3 drops in the affected ear 2 times a day.

Chronic otitis media with cholesteatoma

Cholesteatoma is a rare but clinically significant and potentially life-threatening condition. In a general practice with approximately 2500 patients, one can expect to see a new case of cholesteatoma every 4–5 years. There are two types of cholesteatomas: congenital and acquired.

Congenital cholesteatoma

It is usually discovered incidentally during otoscopy. Otorrhea is not a typical initial symptom, but as the cholesteatoma grows, an accompanying infection may occur, and then there will be discharge from the ear. Congenital cholesteatoma accounts for 3.7–25% of all cholesteatomas. On average, it is diagnosed at the age of 4.5 years, but it can occur as early as 6 months or in adulthood.

Congenital cholesteatoma occurs when ectoderm (the precursor tissue of the keratinized epithelium) enters the middle ear during embryogenesis, proliferates, and spreads, infecting and destroying surrounding structures.

Manifestations

Otoscopy reveals a pearly white, rounded mass behind a normal intact tympanic membrane, and there is no history of otorrhea or otosurgical procedures (including myringotomy). All such cases should be referred to an ENT specialist for further surgical management.

Acquired cholesteatoma

Acquired cholesteatoma is a well-defined mass that occurs when the keratinized epithelium enters the middle ear (after perforation of the tympanic membrane or after otosurgery) and its subsequent proliferation. It may be a consequence of the progression of the tympanic membrane retraction pocket. Cholesteatoma can cause erosion of surrounding structures, in particular the auditory ossicles, and also lead to damage to the facial nerve, cochlea, semicircular canals, bone structures of the mastoid process or to destruction of bone structures with spread into the cranial cavity.

Manifestations

Cholesteatoma is often asymptomatic at first, and when symptoms appear, they may be nonspecific. However, if there is recurrent discharge from the ear with an unpleasant odor, this indicates the need for an

in-depth examination to confirm or deny cholesteatoma. There is conductive hearing loss; sometimes the patient indicates a feeling of fullness or pressure in the ear. In the case of large cholesteatoma, there may be pain, dizziness, the appearance of sensorineural hearing loss or facial nerve paresis. Intracranial complications may occur - meningitis or abscess.

Otoscopy

Perforation can be seen, from which cholesteatoma scales are visible, pus with an unpleasant odor, granulation tissue or polyps can be seen, changes are more often localized in the area of the unstretched part of the eardrum. Sometimes the cholesteatoma is covered with earwax, which masks it.

Treatment

A patient with COM with cholesteatoma who has symptoms of complications (facial nerve paresis, dizziness, sensorineural hearing loss or meningeal signs) should be urgently referred for hospitalization in the ENT department.

The treatment of cholesteatoma (complicated or uncomplicated) is only surgical, therefore a patient with cholesteatoma or suspected of having it should be referred to an ENT for an in-depth examination (CT, MRI, audiogram). In the presence of active otorrhea, such patients are prescribed systemic antibiotic and local antibacterial drugs until the otorrhea disappears/reduces. Rifamycin (Otofa) has the best activity against bacterial pathogens of otitis. Referral for an in-depth examination should not be delayed until an accurate diagnosis is made in a patient in whom cholesteatoma is suspected or in whom repeated courses of adequate treatment are ineffective in stopping otorrhea.

UNCOMMON CAUSES OF OTORRHEA

Foreign objects in the ear canal

Foreign objects can block the lumen of the ear canal, causing secondary ear infection with otorrhea. A case of larvae in the ear (ear myiasis) has been described. If a foreign object is found, it should be removed. The primary care physician can flush it out with a Janet syringe. If it cannot be removed in this way, then a referral to an otolaryngologist should be made. After removal of the foreign object, otorrhea resolves on its own or after subsequent administration of local drops (antibiotic with corticosteroid).

Bullous myringitis

It is manifested by the discharge of blood from the ear. It is a consequence of viral inflammation of the eardrum in acute respiratory viral infections, mainly with a severe course (for example, influenza). Otoscopically - blisters (bullae) on the eardrum, filled with blood or bloody contents).

Granulating myringitis

A rare disease, it is often confused with COM or CEO, which can lead to unnecessary surgery. It is a consequence of chronic inflammation of the tympanic membrane, secondary to infection with *S. aureus* or

Pseudomonas aeruginosa. Granulating myringitis can be secondary to trauma to the eardrum with a cotton swab.

It is manifested by painless otorrhea with or without conductive hearing loss. The diagnosis is mainly clinical, for differential diagnosis, CT of the temporal bones can be done. The PD is totally covered with granulation tissue, mainly in the posterior-upper quadrant; there are vesicles, sometimes perforation. Such a patient should be referred to an otolaryngologist for conservative or surgical treatment.

Ramsay-Hunt Syndrome

This is an auricular herpes zoster, manifested by very severe otalgia, facial nerve paresis, and vesicles in the auditory canal and on the auricle. A small amount of sucrocid, bloody fluid may flow from the vesicles.

Liquorrhea

Clear watery discharge from the ear may be liquor. Liquorice should be suspected in the presence of a history of head injury, skull base fracture, or otosurgical procedures. If CSF is suspected, the patient should be immediately referred for hospitalization.

Trauma to the Eardrum and/or External Auditory Canal

Blood discharge may be a consequence of trauma to the ENT and/or external auditory canal (most often with cotton swabs), but careful diagnostics are required to exclude other causes, which may include otomicroscopy. Bleeding from the ear may be due to the formation of granulation tissue around the ventilation shunt.

Rare causes of otorrhea

Very rare causes of otorrhea include systemic granulomatous diseases (e.g., sarcoidosis or Wegener's granulomatosis), ear tumors, post-radiation otitis media, and post-radiation osteonecrosis of the temporal bone.

Rare cases of otorrhea (Fig.1) as a symptom of neck abscesses—odontogenic submandibular abscess and parapharyngeal abscess—have been described, as well as otorrhea as a symptom of infection of the third lower molar. In these cases, the route of infection into the tympanic cavity is either through the Santorini fissures (thin slits in the anterior wall of the cartilaginous part of the tympanic cavity) or through the permanent foramen tympanicum (Huschke's foramen, a dehiscence of the tympanic cavity that forms a route of infection from the superficial lobe of the parotid gland to the tympanic cavity, or vice versa).

In the case of a salivary fistula, saliva may be released from the external auditory canal. This type of otorrhea is characterized by concomitant edema in the preauricular area and a history of trauma and/or surgery of the parotid salivary gland. Although cases of spontaneous sialoorrhea (through the foramen of Guschke), i.e. without a history of surgery/trauma of the parotid salivary gland, have been described.

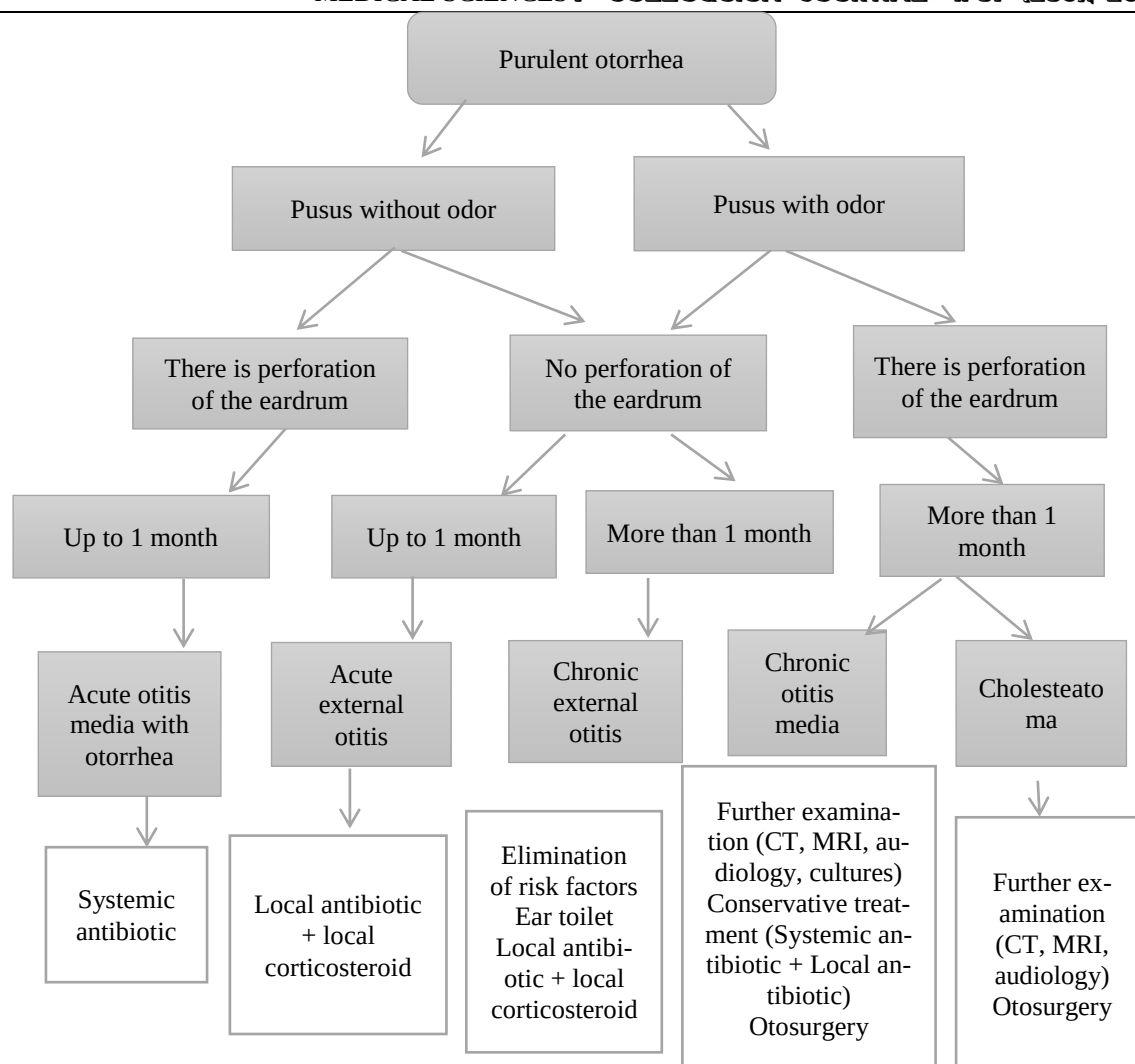


Fig. 1. Algorithm of the doctor's actions in case of purulent otorrhea

Conclusion. Otorrhea is an important symptom of ear diseases, or it can be a manifestation of the spread of diseases from the periauricular areas to the ENT organs. The most common discharge from the ear is pus. The most common causes of otorrhea are AEO or AOM. The doctor should remember about COM with cholesteatoma as a life-threatening pathology. Understanding the cause of otorrhea will help to establish the correct diagnosis and prescribe the correct effective and safe treatment.

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