

THE LACRIMAL SYSTEM AND TEARS —CONT



جامعة ساوة

كلية التقنيات الصحية والطبية

قسم البصريات

المرحلة الثانية

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Types of tears

When you feel strong emotions, or your eyes become dry or irritated, your lacrimal glands produce extra tear film, or tears, to try to address the issue. There are three types of tears:

- **Basal tears** – Always present to keep the eyes moist and protected and to help you see clearly.
- **Reflex tears** – Produced to help clear the eyes in reaction to an irritant, such as wind, debris, smoke or fumes.
- **Emotional tears** – Occur when you have an extreme emotional response to something, whether it's sadness, joy or even anger.

Tears have 3 layers

1. An outer lipid layer produced by the meibomian glands to prevent the tear film from evaporating.
2. A middle aqueous layer produced by the lacrimal glands that helps hydrate the eye, repel bacteria, protect the cornea and bring important electrolytes to the surface of the eye. This watery layer also helps smooth the surface of the eye and allows it to refract light so you can see clearly.
3. An inner mucin layer that helps the tear film spread evenly across the surface of the eye. This layer is produced by conjunctival goblet cells, specialized epithelial cells that secrete mucus onto the surface of the eyes.

Lacrimal gland function

Tear film contains immune system **antibodies, enzymes, antifungal and antibacterial agents** that 1. fight germs and protect the eyes from invading pathogens. 2. These antibacterial molecules allow the lacrimal gland to kill many kinds of organisms on the surface of the eye and react to irritants such as pollution.

Lacrimal glands also secrete **growth factors** to 1. keep the corneas healthy.

2. able to self-repair if injured.

3. able to receive oxygen from the air.

Overall, the lacrimal glands secrete complex fluid rich in antibodies, antimicrobial agents, lubricating fluid, and growth factors that:

A. Protects the corneas from infection and drying out.

B. Helps keep the surface of the eye transparent for clearer vision.

C. Promotes wound healing with special growth factors.



Lacrimal glands vs. Meibomian glands

Meibomian glands produce the oils that sit above the eyes' watery tear film (produced by the lacrimal glands), preventing it from evaporating too quickly. These oils also sit along the edges of the eyelids, forming a barrier to keep your tears in your eyes.

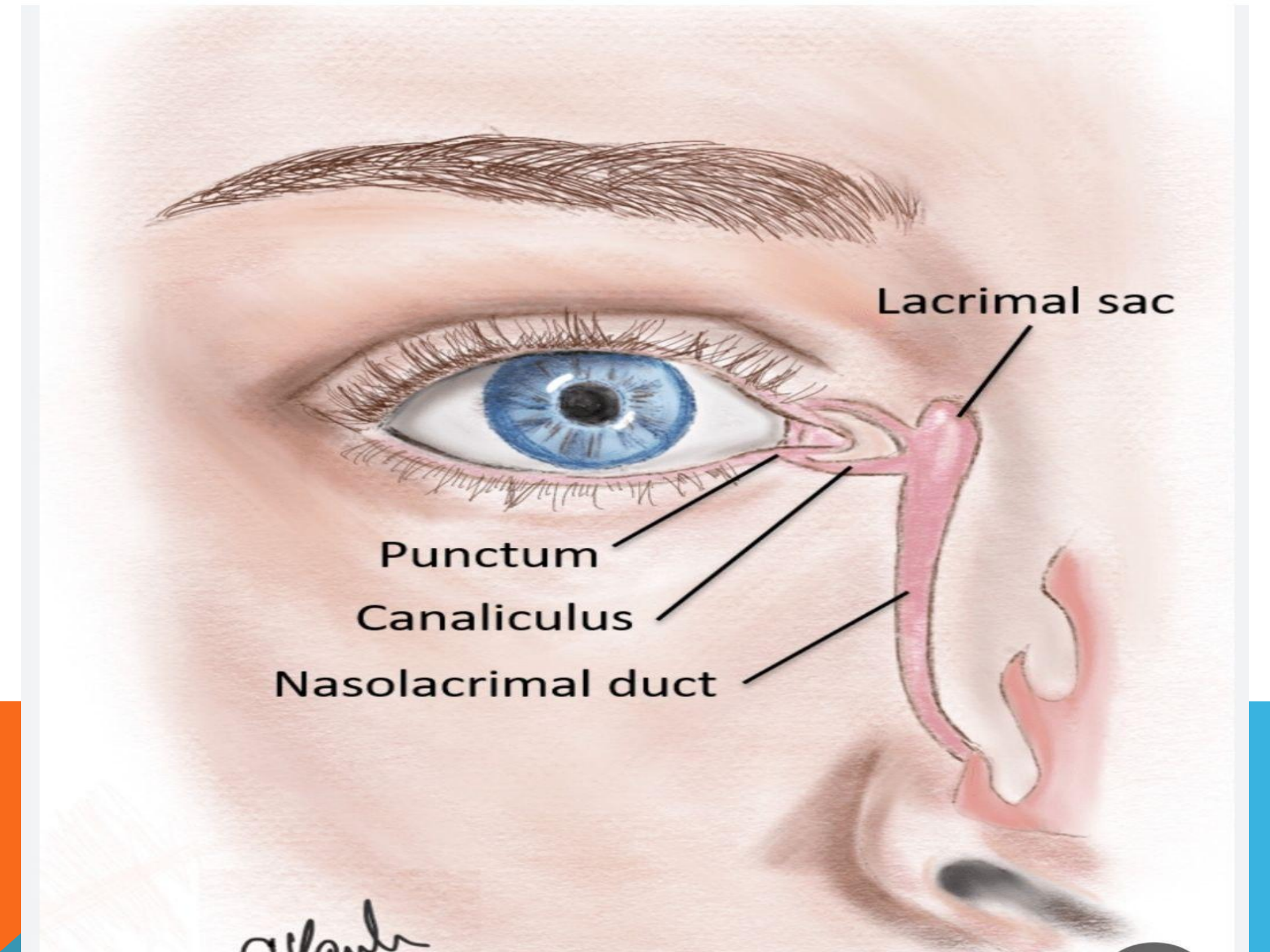


Blocked tear ducts: Causes, symptoms and treatment

A blocked tear duct (dacryostenosis) is a condition in which the eye's tear drainage system is obstructed, meaning tears can't properly drain out of the eye.

Tears normally drain by flowing from the eye through the puncta (two tiny openings in the inside corners of the upper and lower eyelids) $\longrightarrow$ through two short channels (canaliculi) into $\longrightarrow$ a small sac (lacrimal sac), then into tear duct (nasolacrimal duct) and down the back of the nose.

If your tear duct becomes clogged, this process is disrupted, and the affected eye may get red, excessively watery, irritated and inflamed.



This anatomical diagram illustrates the human eye and the associated lacrimal system. The eye is shown with a blue iris and brown eyelashes. The lacrimal system is highlighted in pink and includes the lacrimal sac, which is located in the inner corner of the eye. The punctum, the opening of the lacrimal duct, is shown on the lower eyelid. The canaliculus, the small duct leading from the punctum, is also depicted. The nasolacrimal duct, the larger duct leading from the lacrimal sac down to the nasal cavity, is shown extending from the inner corner of the eye towards the nose. Labels with leader lines identify the following structures:

- Lacrimal sac
- Punctum
- Canaliculus
- Nasolacrimal duct

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causes a clogged tear duct

There are many reasons a baby or adult may experience a blockage in the tear drainage system, including injury, infection or even simple allergies. In babies, the condition can even be present from birth.

The most common causes for dacryostenosis are:

- **Fetal development.**
- **Aging and hormonal changes.**
- **Certain medications.**
- **Chronic sinus infections.**
- **Eye infections.**
- **Injury to the nose. Growths in the nose.**

Blocked tear duct symptoms

No matter the cause of the problem, dacryostenosis symptoms tend to be similar from patient to patient. Common symptoms of a clogged tear duct include:

- Excessively watery eyes.
- Eye irritation and inflammation.
- Swelling around the eye near the nose.
- Redness of the whites (sclera) of your eyes.
- Thick eye discharge.
- Recurring eye infections.
- Blurry vision or other vision changes.

Blocked tear duct treatment

Treatments for clogged tear ducts vary, depending on the underlying cause of the condition.

Here are some typical blocked tear duct treatments

1. **Blocked tear duct medication** — If you have an eye infection, your doctor can prescribe an antibiotic to fight the infection and reduce any inflammation that may be causing the blockage.
2. **Blocked tear duct massage** — In some cases, doctor might recommend to do gentle massage at home and wait to see if the problem resolves on its own. This approach is especially common for a blocked tear duct in newborns.

3.Procedure to unblock tear duct — There are various procedures that doctor can do in the office or hospital to unblock tear duct. One involves using a probe to dilate the puncta and then flushing out these enlarged openings. Another procedure requires using a catheter with a small balloon that can be inflated to unblock the duct. A third procedure involves inserting a tube that stays in the eye for several months to help with tear drainage. These procedures may require general anesthesia, especially for a clogged tear duct in an infant.



Mention the function of growth factors



Thank you

