CONDITION

Eye retraction syndrome

Eye retraction syndrome is a lifelong condition that limits sideways eye movement and pulls the eye backward during certain movements.

WHAT IT IS
Congenital eye movement condition causing limited movement and retraction

BODY SYSTEM
Eyes and nervous system

MAIN SYMPTOMS
Limited sideways movement, eye retraction, eyelid narrowing, head turn

WHAT CAUSES IT
Abnormal eye movement nerve development before birth

HOW IT IS DIAGNOSED
Eye movement testing and a complete eye examination

MAIN TREATMENT
Monitoring, vision treatment, prisms, or eye muscle surgery

CAN IT BE CURED?
No, abnormal nerve wiring remains

IS IT AN EMERGENCY?
No, unless symptoms begin suddenly or follow injury

LONG-TERM OUTLOOK
Usually stable with good vision after appropriate care

Overview

Eye retraction syndrome, commonly called Duane retraction syndrome, is a condition present from birth that affects how one or both eyes move.

Normally, nerves from the brain tell the muscles around each eye when to tighten or relax. In eye retraction syndrome, some of this nerve wiring develops differently before birth. An affected eye may have difficulty moving outward toward the ear, inward toward the nose, or both.

When the eye turns inward, opposing muscles may tighten at the same time. This pulls the eyeball slightly backward into its socket, narrowing the opening between the eyelids. The eye may also move briefly upward or downward.

The condition is usually noticed in childhood and generally remains stable. It does not usually damage the eye, but it can affect eye alignment, visual development, depth perception, and head posture. Early assessment is important because a child's brain is still learning to use vision from both eyes.

Symptoms

The main feature is limited horizontal eye movement. The pattern and severity vary.

Symptoms and signs may include:

Young children are less likely to report double vision because the developing brain may ignore the image from the misaligned eye. Adults may notice double vision in particular directions.

Sometimes the main sign is a child turning their head in photographs, watching television from an angle, or avoiding looking in one direction. One eye is usually affected, although both can be involved.

- Difficulty moving one eye outward, inward, or both ways
- Backward movement of the eye when looking toward the nose
- Narrowing of the eyelid opening during inward movement
- An upward or downward jump during certain movements
- Eyes that turn inward or outward when looking straight ahead
- A regular head turn or chin position used to align the eyes
- Reduced depth perception or difficulty using both eyes together
- Blurred vision in one eye if visual development has been interrupted

Causes and risk factors

Eye retraction syndrome develops before birth. It belongs to a group called congenital cranial dysinnervation disorders, in which nerves do not connect with muscles in the usual way.

The nerve that normally moves the eye outward may be absent, small, or not working normally. Another nerve may signal the outward-pulling muscle at the wrong time. Opposing muscles then tighten together, causing retraction and eyelid narrowing.

Most cases occur without a clear reason or family history. They are not caused by anything a parent did during pregnancy.

A minority are related to an inherited genetic change. Inherited forms are more likely to affect both eyes or occur with other congenital differences. Rarely, the syndrome is part of a broader condition affecting hearing, the face, limbs, spine, kidneys, heart, or other cranial nerves.

There are no known lifestyle risk factors. Screens, reading, eye strain, and glasses do not cause the condition.

Diagnosis

Diagnosis is usually based on a detailed eye examination. No single blood test confirms the condition.

An eye specialist observes each eye while the person looks in different directions. They check for restricted movement, retraction, eyelid narrowing, and upward or downward jumps. Eye alignment is measured while looking straight ahead and to each side.

The assessment also checks:

In children, the specialist looks for amblyopia, or lazy eye. This is reduced vision caused by the brain relying less on one eye during early childhood.

Scans are not routinely needed when findings are typical and have been present since early life. MRI or other tests may be considered if symptoms began suddenly, are worsening, involve pain or other nerve problems, or do not fit the usual pattern. Testing can help rule out a nerve palsy, eye socket problem, or another cause of restricted movement.

Hearing, neurological, genetic, or general medical assessment may be suggested if both eyes are affected or there are other congenital differences.

- Vision in each eye
- Whether glasses are needed
- Depth vision and how well the eyes work together
- Alignment at different distances
- Head posture
- The health of the eyes

Treatment and management

Treatment depends on the effects on vision, alignment, appearance, and head posture. Some people need observation only.

Regular eye examinations may be enough when vision is equal, the eyes are reasonably straight when looking ahead, and there is no troublesome head turn. Follow-up is especially important during childhood.

Glasses can correct short-sightedness, long-sightedness, or astigmatism. They do not change the nerve wiring, but clearer vision may help the eyes work together. Prism lenses may reduce double vision or a small head turn in selected people.

If amblyopia develops, treatment encourages the brain to use the weaker eye. This may involve patching the stronger eye or using medicine to blur it temporarily. Treatment requires professional supervision because the plan depends on the child's age and vision.

Eye muscle surgery may be considered for:

Surgery changes the pull of the eye muscles and may improve alignment or bring the comfortable field of vision closer to the centre. It cannot restore normal nerve connections or guarantee full movement in every direction.

More than one operation may be needed. Possible outcomes include remaining or new misalignment, reduced movement in another direction, vertical deviation, scarring, or further surgery.

- A significant head turn
- Marked misalignment when looking straight ahead
- Severe eye retraction
- Prominent upward or downward movements

Complications

Many people do not develop serious complications. The main concerns are visual development and the effects of adapting to restricted movement.

Amblyopia can occur if one eye is consistently misaligned or has a different focusing error. Without treatment during childhood, reduced vision may become permanent.

Reduced binocular vision can affect depth perception, although many people adapt well. A long-standing head turn may cause neck discomfort or make facial asymmetry more noticeable.

Visible movement differences may affect confidence or social experiences. Double vision can interfere with reading, driving, or work requiring gaze in a particular direction. New or changing double vision should be reassessed.

Prevention

Eye retraction syndrome cannot usually be prevented. It develops before birth because of abnormal nerve and muscle control, and there is no known action during pregnancy that reliably prevents it.

Early eye assessment cannot remove the condition, but it can help prevent avoidable vision loss from amblyopia. Recommended appointments allow focusing errors, alignment, and visual development to be monitored.

If an inherited form is suspected, genetic counselling can explain possible family patterns. It cannot predict every case or prevent the condition in an individual pregnancy.

Living with it and what to expect

Eye retraction syndrome is lifelong because the underlying nerve wiring does not change. In most people, movement restriction remains broadly stable rather than progressively worsening.

Children often turn their head instead of moving their eyes into a restricted direction. A small, comfortable head turn may not need treatment.

Childhood follow-up focuses on visual development, glasses, eye alignment, and amblyopia. Appointments may become less frequent once vision has matured and the condition is stable.

Adults with stable alignment may need only routine eye care. Review is appropriate if double vision develops, head posture becomes uncomfortable, or alignment changes. New symptoms should not automatically be attributed to a condition present since birth.

Most people can attend school, work, exercise, and use screens normally. Driving eligibility depends on visual acuity, field of vision, double vision, and local licensing rules rather than the diagnosis alone.

Treatment may improve alignment or posture, but it does not make the eye's nerve supply typical. Realistic goals are important when considering surgery.

When to get medical help

Arrange a routine eye assessment for limited eye movement, a repeated head turn, eye retraction, eyelid narrowing with movement, or eyes that do not point in the same direction. Children should be assessed promptly because untreated amblyopia can affect long-term

vision.

Make a follow-up appointment if a known condition causes increasing neck discomfort, trouble at school or work, troublesome double vision, or changing alignment.

Seek urgent medical care for a sudden new restriction of eye movement, especially with double vision, eye pain, a drooping eyelid, or a pupil change. A congenital condition does not usually begin suddenly, so another cause must be excluded.

Seek emergency care if new eye movement problems occur with severe headache, weakness, numbness, confusion, difficulty speaking, loss of balance, major head or eye injury, or sudden vision loss.

Common questions

Is eye retraction syndrome the same as a lazy eye?

No. Eye retraction syndrome is an eye movement condition caused by unusual nerve wiring. Amblyopia, or lazy eye, is reduced vision caused by abnormal visual development. Eye retraction syndrome can lead to amblyopia, but they are different conditions.

Will it get worse as I get older?

The underlying movement pattern is usually stable. Head posture, alignment, double vision, or comfort can still change. Any clear change should be assessed.

Can glasses fix eye retraction syndrome?

Glasses cannot restore the abnormal nerve connection or normal movement. They can correct focusing problems, support visual development, and sometimes improve alignment. Prism lenses may help with double vision or a small head turn.

Will surgery make the eye move normally?

Usually not. Surgery adjusts the forces produced by the eye muscles. It may straighten the eyes when looking ahead, reduce a head turn or retraction, or limit upward and downward jumps. Movement can remain restricted after successful surgery.

Can it affect both eyes?

Yes, although one eye is more commonly affected. When both are involved, the movement pattern may differ between them. Bilateral involvement can sometimes be associated with an inherited form or other congenital findings.

Can eye retraction syndrome cause blindness?

The condition does not usually cause blindness or damage the structures that sense light. It

can contribute to reduced vision if amblyopia develops during childhood. Early detection and treatment help protect visual development.

Sources

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