

Vertigo

Introduction

Vertigo is the sensation of spinning or false movement. It can result from trauma, infection, or diseases that affect the inner ear. Vertigo is usually a harmless condition but a doctor should evaluate it. Vertigo may be treated with medications, surgery, or rehabilitation therapy.

Anatomy

Balance is a complex function. Balance requires the ability to produce movements and interpret information about your body's position in space. Balance requires the coordination of your visual, somatosensory, and vestibular systems.

Your visual system provides information about your environment and allows you to maintain your gaze no matter how you move your head. Your somatosensory system consists of proprioceptive nerve endings throughout your body, which provide your brain with information about the location of your body in your environment. The vestibular system in your inner ear sends signals to your brain about the position of your head. Coordinated muscle movements continually move your body and keep it in an upright position. If any of the systems are disrupted, the illusion of movement, balance problems, and dizziness can occur.

The vestibular system is needed for balance and position sense. The vestibular system consists of the semicircular canals and the otoliths. The semicircular canals are three small loops that are filled with liquid and tiny hairs. The liquid in the semicircular canals moves whenever you move your head. In turn, the liquid moves the tiny hairs. The hairs have position sensors that send messages to your brain about the position of your head. Your brain processes the message and sends signals to your muscles so that you keep your balance.

The otolith structures in your inner ear are called the saccule and utricle. They contain tiny hairs and otoconia crystals that float in gel. When you move your head, the otoconia crystals move inside of the gel and put pressure on the hair cells. When the hair cells move, they send messages to your brain. The utricles mainly send messages to signal eye movements, so that you can maintain your gaze. The saccules primarily send messages about the position of your head. Your brain processes the information and sends signals to your muscles to keep your body in an upright position.

Causes

Vertigo is the false sensation that you or your environment is spinning, when in actuality it is not. For example, vertigo can make it seem like a room is spinning or moving. Injuries or medical conditions can affect the vestibular system in the inner ear, change the way nerve signals travel, or change the way nerve signals are processed in the brain. Additionally, trauma and neurological disorders can interfere with visual processing.

You may experience vertigo because of one or more contributing factors. Benign paroxysmal positional vertigo (BPPV), labyrinthitis, and vestibular neuritis most frequently cause vertigo. Vertigo can result from multiple sclerosis, traumatic brain injury, Ménière's disease, and acoustic neuromas.

BPPV occurs when the otoconia break off and float freely in the ear canal or enter the semicircular canals. The otoconia may break free during a whiplash or head injury. Because the otoconia are free floating, they send confusing messages to the brain about the body's position. The mixed messages result in vertigo.

Vestibular neuritis is caused by a viral infection that affects the vestibular nerve and disrupts the nerve signals. Labyrinthitis can result after an ear infection, allergy attack, or an upper respiratory infection. It causes parts of the inner ear to become irritated and swollen. The inflammation in the inner ear interferes with balance functions and can cause hearing loss.

Symptoms

The main symptom of vertigo is the illusion of movement. You may feel like you or your environment is spinning. Vertigo can last from minutes to hours. It may become worse when you change the position of your head. It may stop when you hold your head still.

You may experience nausea, vomiting, and sweating. You may have abnormal eye movements. It may be difficult to walk, talk, or keep your balance. Some causes of vertigo may also result in hearing loss or a ringing in the ears.

Vertigo is usually a harmless condition, but a doctor should evaluate it. In some cases, vertigo is associated with serious and life threatening conditions. A person should be taken to a hospital's emergency room if he or she experiences double vision, headache, weakness, difficulty speaking, abnormal eye movements, difficulty walking, difficulty controlling his or her arms or legs, odd behavior, difficulty waking up, and altered consciousness.

Diagnosis

Your doctor can begin to diagnose vertigo after reviewing your medical history and conducting a physical exam. You should tell your doctor about your symptoms and any recent injuries. Your doctor will check your ears for signs of infection. In the case of a suspected head injury, your doctor may order imaging tests to view the structures in your skull, ear, and brain.

If BPPV is suspected, your doctor will have you perform the Dix-Hallpike maneuver. For the procedure, you will hold your head in a specified position and quickly lie backward on an exam table. Your doctor will evaluate your eye movements and ask if you experienced vertigo.

An electronystagmography (ENG) is diagnostic test for vertigo that uses electrodes placed around the eye area to record eye movements. A video nystagmography (VNG) is a similar test that uses an infrared video system to provide a detailed analysis of eye movements. Caloric testing can also test your eye reflexes. Your doctor will briefly insert water or air of varying temperatures into your ear and note your eye movements.

Treatment

Treatment for vertigo depends on the cause of your condition. Medications may be used to treat ear infections. Structural problems in the inner ear may require surgery.

BPPV is usually and easily treated with the Epley Maneuver. An occupational or physical therapist can perform this treatment. For the procedure, your head is simply placed in specific positions to reposition the otoconia crystals in your ear.

Am I at Risk

You may be at risk for vertigo if you have experienced head trauma or whiplash. Your risk may increase if you develop medical conditions that are associated with vertigo.

Complications

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Advancements

Surgical options are available for severe cases of vertigo that do not respond to repositioning maneuvers. Posterior ampullary nerve transection and posterior semicircular canal occlusion are the 2 specific techniques used in intractable BPPV surgery.

This information is intended for educational and informational purposes only. It should not be used in place of an individual consultation or examination or replace the advice of your health care professional and should not be relied upon to determine diagnosis or course of treatment.