Visual Field Defect

The visual fields are the areas that are seen by each eye. The nerves that receive visual signals follow a complex path. These nerves go from the back of the eye to the very back of the brain (*occipital lobe*), which is the center for vision.

The nerves follow a complicated path on their way from the eyes to the brain and anything affecting the eyes themselves, the optic nerves, the cross over point (optic chiasm), the optic tracks or the back of the brain can cause a part of the visual fields to disappear. This is called a visual field defect.

By carefully testing the visual fields for areas of vision that are missing, it is often possible to tell where the problem lies along this complicated pathway.

CAUSES

There are a great many diseases and disorders that can cause visual field defects because any problem at any point along the complicated path to the back of the brain can be at fault. There are too many causes of visual defects to list, but here are some just some of the types of problems that cause visual field defects:

Diseases of the Eyes

- Glaucoma.
- Diseases or defect of:
  - The cornea.
  - The lens (*cataract*).
  - The fluid inside the eye (the *vitreous*).
- These visual defects usually "float" or seem to move.
  - The retina.
  - The optic nerve.

Diseases of the Optic Chiasm

- Tumors of, or near the optic chiasm.
- Tumors and diseases of the pituitary gland.
- Hemorrhages, aneurysms, or other disorders of the blood vessels near the optic chiasm.

Diseases of the Optic Tracks

- Hemorrhages (stroke), aneurysms, or other disorders of the blood vessels within the brain.
- Brain tumor.
- Neurological diseases of the brain (e.g. multiple sclerosis).
- Increased pressure inside the head.

Diseases of the Brain

- Disorders of development
  - Amblyopia (poor vision in one eye due to underdevelopment of the brain's visual center in childhood).
- Hemorrhages (stroke), aneurysms, or other disorders of the blood vessels within the brain.
- Brain tumor.
- Brian infections.
- Neurological diseases of the brain (e.g. multiple sclerosis).
- Increased pressure inside the head.
- Drugs (e.g. digitalis poisoning).
- Poisoning (e.g. lead poisoning, methanol poisoning).

Diseases of the body or other organs (e.g. pernicious anemia, drug toxicity).

SYMPTOMS

It is important for the doctor to know if visual field defects are present in both eyes or just one eye. The defect can be subtle. Often a patient does not know that a small portion of vision is missing. When a visual defect is present in just one eye, the disease or problem is almost always in the eye or the optic nerve on that side. If a defect is found to be present in both eyes, it is important that testing is carried out. This is because there may be a problem within the brain behind the point where the optic nerves meet and cross (*optic chiasm*).

DIAGNOSIS

Visual field testing is done in the doctors office and is easy and painless. With one eye patched, the patient is asked to look at the center of a screen or large bowl shaped machine. The patient is told to press a button whenever he or she sees a small light with their side vision. By doing this, the visual field in each eye is "mapped" looking for areas of lost or diminished vision. Everyone has a normal "blind spot" where the optic nerve leaves the eye, but even the size and shape of the blind spot is mapped to look for abnormalities.

TREATMENT

Treatment depends on the cause of the visual defect(s). If the problem is not coming from the eye(s), more testing may be needed to find the cause of the problem. Additional testing includes:

- X-rays of the head.
- CT scanning.
- injecting a dye into the bloodstream with X-rays of the head (*angiography*).
- Other investigations.

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