Gradual Loss of Vision

The separate article Blurred Vision covers acute vision loss.

Overview

There are a number of reasons why a patient's vision may be gradually declining. This can be very worrying for some patients. In others, the loss is so subtle that it is only picked up on routine screening by the optician. When the patient presents, it is important to take a thorough history, as the patient's perception of visual impairment (I can't read the paper) may be different to yours (the patient can see the words but they appear distorted rather than blurred, making the reading difficult). Visual impairment can have a profound impact on psychosocial well-being.\(^1\)

Many causes of gradual visual loss can be diagnosed on history and examination alone with only the most basic additional investigations. This article will provide you with an outline of how to assess the patient presenting with gradual loss of vision, and the possible diagnoses and features that may help confirm these. Follow the links to find out more about the diagnoses themselves.

Assessment

History

A routine history is mandatory and will often guide you to a possible cause. Specifically ask about:

- **The nature of the problem:**
  - Unilateral versus bilateral.
  - Blurred vision: whether this is the whole field, close, distance or both.
  - Restricted visual field: often noted following difficulties in driving, knocking into things at the periphery of vision
  - Distorted rather than blurred vision (eg, dent in printed words, door/window frames, objects appearing smaller or larger). If so, check with an Amsler grid (see under 'Further reading & references', below). **Distortion of straight lines indicates serious macular pathology and needs urgent referral.**
  - Bits of visual field missing altogether: central versus peripheral; establish what the remainder of the vision is like.

- **Onset:**
  - Note when the problem occurred and whether there were any significant health issues at that time.
  - Ask how is was first noticed. Unilateral visual loss might have gone unnoticed until the patient closed the other eye.

- **Progression:** ask whether there has been a slow and steady decline; whether there have been step-wise drops in visual acuity, or whether the problem has been intermittent. If intermittent, think of transient ischaemic attacks (TIAs) or impending acute angle-closure glaucoma.

- Ask whether there have been any associated factors. For example, pain (very important diagnostically, see 'Painful loss', below), redness, or visual phenomena - eg, haloes, flashes of light, new floaters. **These symptoms usually merit an urgent referral.**

- Ask whether there are any precipitating factors. Specifically ask about changes over the course of a day and whether vision is better in the day or at night.
Other important aspects of the history include the past ocular history, medical history, family history, medication and social history:

- Is this affecting their lifestyle?
- Are there implications with regard to their work or driving?
- Will this mark the loss of their independent living?

Examination

Important points to note on examination are:

- The visual acuity of both eyes. Note whether this improves using a pinhole.
- The red reflex: a media opacity (appears black against the red reflex) suggests a corneal, lens or vitreous problem. To localise the site of the opacity with respect to the pupil (lens):
  - Slowly shift the direction of your ophthalmoscope light.
  - Look at the direction in which the opacity appears to move in relationship to the pupillary (central) axis.
  - If there is no ‘movement’ of the opacity, it lies within the pupil (lens).
  - If the opacity ‘moves’ in the same direction, it is anterior to the lens (cornea).
  - If the opacity ‘moves’ in the opposite direction, it is posterior to the pupil (posterior lens or vitreous).

If the media is clear, it is more likely to be a retinal or optic nerve disorder.

- If there is a normal red reflex, take a good look at the fundus.
- Do a functional testing of visual field, pupils, optic nerve and macula.
- Use an Amsler grid to look for distortion of straight lines - if present, this indicates serious macular pathology and needs urgent referral. A grid is available from 'Further reading & references', below.

The separate article Examination of the Eye explains in detail how to do all these tests. Complement your examination with a blood pressure check and a urine glucose test. A neurological examination may be necessary if everything else seems completely normal.

Interpreting the findings - some clinical patterns

Note that the optic nerve fibres divide and cross over at the optic chiasm, which can help you locate the site of the visual defect:

- Loss of vision in one eye - implies the problem is in the eye itself or in the optic nerve before it reaches the optic chiasm.
- Loss of vision in both temporal fields (bitemporal hemianopia) - occurs from lesions compressing the optic chiasm (eg, pituitary tumour or craniopharyngioma).
- Loss of left or right visual field (homonymous hemianopia) - implies the lesion is somewhere between the optic chiasm and the occiput.

In the eye itself:

- Chronic glaucoma tends to cause tunnel vision (loss of peripheral visual field).
- Macular degeneration causes loss of central visual field (central scotoma) and may cause distortion of straight lines.

Causes of gradual vision loss

Painless loss [2]

- **Refractive error** - this is characterised by an improvement of the visual acuity with the use of a pinhole (if you don't have a specific occluder with pinholes, a biro point-sized hole in a stiff piece of cardboard will do). Refer to the optician.
- **Cataracts** - the patient often complains of glare in dark conditions (and so difficulty in driving at night) and may complain that colours appear more dull than they used to. There may be an abnormal red reflex and, in advanced cases, the cataract may be visible to the naked eye (this is increasingly rare these days). Other aspects of the examination should be normal unless there is concurrent pathology. Refer routinely.
- **Age-related macular degeneration (AMD)** [3] - suspect AMD if the patient is aged >50 years and is presenting with either of the following symptoms, usually affecting one eye at a time:
  - Distortion of vision, where straight lines appear crooked or wavy.
  - Painless loss or blurring of central or near-central vision. The person may describe a black or grey patch affecting their central field of vision (scotoma).

Various other visual symptoms can occur, or AMD may be an incidental finding by an optometrist. Visual acuity on a Snellen chart may be normal or reduced. When viewing an Amsler chart (or graph paper), patients may see breaks, waviness, or missing portions of the lines. Refer urgently if AMD is suspected (see box "Urgent referral for suspected AMD", below).

- **Chronic (primary) open-angle glaucoma** - is most commonly picked up through screening. If it is so advanced that the patient is the first to notice it, very little can be done. It is characterised by a progressive peripheral visual field loss and ‘cupping’ of the optic discs (the central area of the optic disc enlarges and the peripheral rim thins out). The degree of urgency depends on how advanced the damage is.
- **Diabetic retinopathy** - the problem may be due to the diabetic microvascular problems (ie exudates and haemorrhages), to associated pathology (eg, diabetic cataract) or unrelated pathology (eg, glaucoma). Refer promptly (within a week), as prompt treatment may prevent deterioration.
• **Compression of optic nerve or optic pathway** - rare, but should be considered if there is a history of headaches and if you find any neurological or endocrinological abnormalities (eg, acromegaly) on examination. Look for a relative afferent pupillary defect (not usually present in the above conditions), a pale or swollen optic disc (the margins are not clear) and visual field defects (as explained under 'Assessment', above).

• **Drugs, toxins or nutritional deficiency**[4] - eg:
  - Amiodarone - various effects on the eye
  - Antituberculous drugs - ethambutol and isoniazid (optic neuritis).
  - Hydroxychloroquine (maculopathy).
  - Systemic steroids (cataracts and glaucoma)
  - Phosphodiesterase inhibitors (eg, sildenafil).
  - Others drugs - tetracyclines (benign intracranial hypertension), isotretinoin, tamoxifen (various possible effects on vision).
  - Alcohol, smoking and nutritional deficiency - eg:
    - Tobacco-alcohol amblyopia.[6]
    - Methanol poisoning.[7]
  - Vitamin A deficiency (classically causes night blindness.[8]

• **Hereditary retinal dystrophies** are rare and, depending on the exact problem, present anywhere from early childhood to middle age. Some are rapidly progressing; others are very slow. Typical features particularly include poor night vision and intolerance to light. Poor appreciation of movement in the peripheral visual field may also be a feature. Ask about similar problems in family members (who may not have been diagnosed). Children should be referred more promptly than adults for whom a routine referral is fine. These patients will need genetic counselling as well as support where the prognosis is poor.

• **Cerebrovascular disease** (stroke and TIA) - although these are likely to present acutely. TIA causing visual loss is termed amaurosis fugax.

• **Papilloedema** - eg, from intracranial hypertension.

### Painful loss

This is much rarer and tends to suggest a more sinister pathology such as:

- A progressive neoplastic (eg, choroidal melanoma) or inflammatory process (eg, chorioretinitis).
- A systemic problem (eg, sarcoidosis or collagen vascular disease).
- Lesions on the optic nerve (eg, optic neuritis, granuloma or neuroma).
- Intracranial pathology or masses (may present with headache, or with endocrine symptoms if a pituitary tumour).
- Intracranial hypertension (may have headache).

Be guided by the patient's past medical history, a neurological as well as ocular examination and baseline blood tests (these can be carried out at the same time as a referral is made). All these patients should be referred. Referral is more urgent than with painless conditions and patients should really be seen within a few days.

### Referral

Any patient with an acute deterioration of vision (over hours or days) will need immediate or same-day referral - see separate **Blurred Vision** article.

For patients with gradual loss of vision, most will need referring to ophthalmology for diagnosis. The urgency of the referral depends on the clinical situation - if in doubt, discuss with an ophthalmologist.

### Scenarios that need urgent attention are:

- Where vision might be preserved by prompt treatment - for example:
  - Suspected AMD - particularly if there is distorted vision or rapid change (see box, below).
  - Diabetic retinopathy.

- Where sinister pathology is suspected.
- Where the loss is bilateral.
- Where there is pain, a red eye, or there are additional visual symptoms - eg, flashes.
- Where visual deterioration has been relatively rapid, is progressing, or there is a new deterioration.
- Monocular patients or those who already have poor vision in one eye. Any vision loss in the 'good' eye requires urgent assessment.

#### Urgent referral for suspected AMD[2]

If **AMD** is suspected, refer urgently - to be seen in ≤1 week:

- **Reason** - with the neovascular form of AMD, prompt treatment may preserve vision. GPs cannot be expected to differentiate neovascular AMD from other types.
- **Urgent referral is particularly important if there is**:
  - Distortion of vision (check with the Amsler chart).
  - Visual loss that is of rapid onset.

The referral route depends on local pathways - for example:

- Fast-track macular clinic or medical retina clinic treatment centre (if available).
• Local district general hospital eye service.
• Optometrist ('optician') - only if the patient will be seen in ≤1 week AND the optometrist is able to refer promptly onward to an ophthalmologist if necessary. This is not yet universal.

**NB:** advise the patient that if there is delay of >1 week in seeing the optometrist/ophthalmologist or if symptoms are worsening, they must attend Eye Casualty or other emergency doctor, to expedite specialist assessment.

If there is no suspicion of an urgent problem and the patient has not had a recent sight test, consider referring the patient to an optometrist in the first instance - there may simply be a refractive error.

**Managing visual loss**

• Advise the patient not to drive and that, if their vision does not meet the Driver and Vehicle Licensing Agency (DVLA) criteria for fitness to drive, they should inform the DVLA. [8]
• Potential treatment options for the future include bionic devices using electrical stimulation of the visual pathways and stem cell transplantation. [10, 11]
• Hospital clinics should provide support and follow-up around the time of diagnosis, even if no medical treatment is available for the condition. [2]

The possibility of severe sight impairment is a terrifying thing in all people. In the younger person, there are huge issues relating to socialising, studying, and getting a job. In the older person, independent living may be jeopardised. In all patients, there may be existential questions about self-definition, fear of isolation and the possibility of depression. This needs to be acknowledged yet sensitively balanced with the reality of the condition - eg, it is fairly unusual for conditions to lead to total sight loss and the patient can often learn to use their residual vision. There is a range of practical support (visual aids, mobility training, educational support for children) and there are many support groups that can offer help, whether general (eg, the Royal National Institute of Blind People (RNIB)) or specific (eg, the Macular Society).

You will find more information on management and support of these patients in the separate relevant articles (see links above) and in the separate article Severe and Partial Sight Impairment.

**Further reading & references**

- Snellen Chart; Living Well with Low Vision
- The Ansler grid; UC Davis Health System
- Royal National Institute of Blind People (RNIB)
- Macular Society

2. Macular degeneration - age-related; NICE CKS, March 2010 (UK access only)
8. Assessing fitness to drive: guide for medical professionals; Driver and Vehicle Licensing Agency

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