

# Symptoms in Heterophoria and Heterotropia and the Psychological Effects of Strabismus

## Asthenopia and Diplopia

Persons can overcome a heterophoria, provided there is no interference with fusion, by maintaining a tonus distribution in the extraocular muscles so that their visual axes are parallel for distance and are properly directed in near vision. Under certain circumstances, this task may be too difficult and may cause subjective symptoms consisting of discomfort of varying degree and location, so-called asthenopic symptoms, or diplopia.

Patients always relate the symptoms to use of their eyes and to so-called eyestrain. Complaints range from redness and a feeling of heaviness, dryness, and soreness of the eyes, to pain in and around the eyes, frontal and occipital headaches, and even gastric symptoms and nervous exhaustion. The eyes are easily fatigued, and such patients often have an aversion to reading and studying. Typically, these complaints tend to be less severe or to disappear altogether when patients do not use their eyes in close work. Close work also is easier when the patient is rested or when one eye is closed.

Virtually everyone has a heterophoria, but comparatively few people experience symptoms. The appearance of symptoms depends on the state of the sensorimotor system, the use made of the eyes, and the general well-being of a person. The absolute amount of the heterophoric deviation is not the most important factor; what matters is the presence or absence of a discrepancy between the deviation and amplitudes of motor fusion. If the amplitudes are inadequate to cope comfortably with the deviation, asthenopic symptoms may arise.

Vertical deviations are especially likely to cause symptoms, since the vertical fusional amplitudes generally are limited, although one encounters remarkable exceptions (see Chapter 20). Even if the amplitudes are adequate, patients will sometimes develop asthenopic symptoms or even diplopia following a debilitating disease. For example, after severe pneumonia, when they begin to read they will often state that the disease has “affected their eyes.” What actually has happened is that their general level of energy is too low to allow them to overcome their heterophoria with the same ease as when they were in normal health. In these cases symptoms usually are transient.

Asthenopic symptoms are less frequent in distance vision than in near vision, because there is less strain on the sensorimotor system. However, it can be distressing to watch moving objects in the distance, such as in movies, on television, or from fast-moving cars, or at a ball game, since maintenance of fusion in such circumstances is difficult and may produce stress.

Asthenopic symptoms are much more common when doing close work requiring sustained fixation, often for hours, at the same visual distance. It does not allow for roving gaze in the same manner as distance fixation. Maintenance of proper alignment of the eyes may represent a considerable strain on the sensorimotor system of the eyes. This is why asthenopic symptoms tend to occur during the last years of high school or college or in professional work requiring prolonged close application, but rarely, if ever, in preschool children.

Not all asthenopic symptoms are caused by neuromuscular anomalies. If they are, the condition is termed *muscular asthenopia*, but often they are caused by uncorrected refractive errors, including aniseikonia (see Chapter 7). One speaks then of *refractive asthenopia*. One cannot always be sure whether a patient's complaints are the result of muscular or refractive asthenopia, as shown in the following case.

#### CASE 10-1

In the course of a routine ophthalmic examination of a freshman class of nurses, a 19-year-old woman reported that she had experienced severe eyestrain on close work during the last 2 years in high school. She had worked hard and was a good student. She had never had an eye examination. The globes were normal in all respects. Vision was 6/6 in each eye. The refraction revealed OU + 2.75 + 0.25 cyl ax 90°. There was an exophoria of 20<sup>Δ</sup> for distance and 25<sup>Δ</sup> for near, with large amplitudes and full stereopsis. The patient was told that she should wear glasses but that these might make her symptoms worse. She was given the glasses and was immediately symptom-free. During a follow-up period of 3 years, the symptoms did not return. Clearly, this was a case of refractive asthenopia, not of muscular asthenopia, as was anticipated.

Another cause of asthenopia, frequently overlooked in children of school age, is caused by *accommodative insufficiency*.<sup>2, 4</sup> This condition may occur without an obvious cause, possibly on

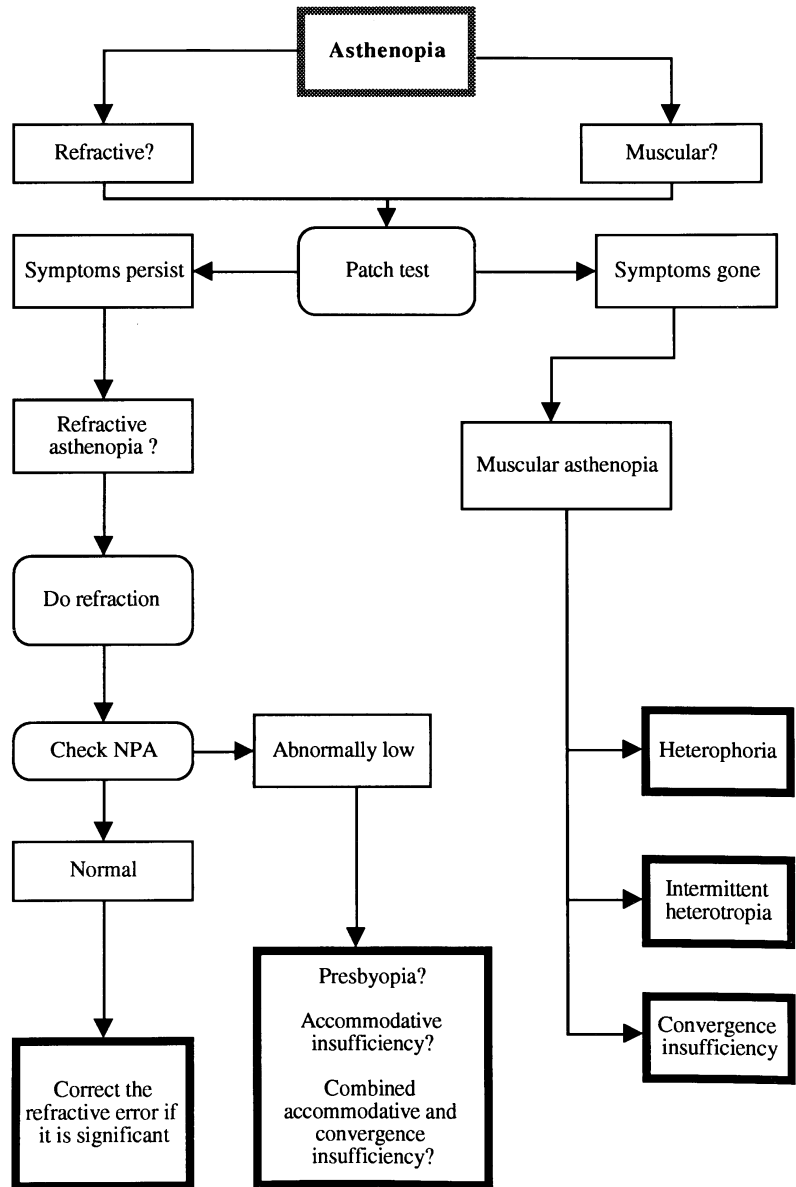
a congenital basis or as a sequela to head trauma. We have also observed transient accommodative insufficiency in a 12-year-old child who had been bitten by a poisonous spider. It is advisable to check the near point of accommodation routinely in all asthenopic patients who are old enough to give reliable responses.

Whenever the ophthalmologist finds it difficult to decide whether a patient's asthenopia is caused by muscular or refractive factors, it is advisable to have the patient wear an occlusive patch over one eye for several days. If this *patch test* relieves the symptoms, asthenopia is most likely caused by muscular factors. The decision-making process<sup>7</sup> involved in interpreting the results of the patch test is summarized in Figure 10-1.

To prevent asthenopic symptoms and diplopia, humans have a built-in mechanism—suppression. By suppressing the images from one eye, at least regionally, asthenopic symptoms may be greatly reduced or altogether done away with. Suppression is most active in patients with heterotropia. Heterotropic patients therefore only rarely complain of such symptoms; if they do, such symptoms are most likely to be accommodative. Nor is diplopia common in untreated patients with comitant heterotropia. Not all people suppress equally well. Patients with a well-functioning sensory system and a strong compulsion to fusion do not readily suppress, but they may have to pay for their excellent binocularity with asthenopic symptoms. A child with a large exophoria and without any symptoms may develop an exotropia in later life or stay exophoric and develop symptoms of eyestrain with sustained close work. Which of the two paths the patient will follow depends on the state of the sensorimotor system.

Diplopia in its various manifestations is discussed further in Chapter 13.

Asthenopic symptoms, regardless of their cause, may be misinterpreted as a sign of neurotic tendencies. There is little doubt that some patients complaining about asthenopia are truly neurotic, have a fixation about their eyes, exaggerate their suffering, have a fear of blindness, or crave attention; but the ophthalmologist is quite wrong to attribute all asthenopic symptoms to neurosis. We feel defeated if we cannot find a physical cause for a patient's complaints and should always ask ourselves the cause and effect in such patients—do they complain because of their constant eyestrain, or do they complain of eyestrain because they are disturbed in some other way?



**FIGURE 10-1.** The differential diagnosis of asthenopia based on the patch test. NPA, near point of accommodation. (Modified from Noorden GK von, Helveston EM. *Strabismus: A Decision-Making Approach*. St Louis, Mosby-Year Book, 1994, p 132.)

How a patient deals with diplopia depends very much on his or her personality. A perfectionist knows that the second image should not be there, that it is wrong, and that it is a flaw. The continual search for that second image reinforces the patient's disturbance. A more relaxed person will acknowledge the presence of two images, but usually will take it in stride. Such patients have learned how to distinguish the double image from the "real" image, act accordingly, and by disregarding it and not allowing it to disturb them, learn how to live with it.

We have encountered on several occasions patients who complained about intermittent diplopia

and, on examination, were found to have essentially normal ocular motility. Further questioning established that they had become aware of physiologic diplopia. How Walter B. Lancaster dealt with this problem was often recounted with great relish by the late Hermann Burian.

A faculty colleague at Dartmouth College once consulted Dr. Lancaster with the following complaint: Whenever he looked out of his window to contemplate a beautiful old tree outside, a curtain string hanging from his window was seen double. After the eye examination showed nothing abnormal, Dr. Lancaster explained to the patient the phenomenon of physiologic diplopia. This was apparently to no avail since the patient kept returning to his office with the same com-

plaint. Finally, Dr. Lancaster's patience ran out; he scribbled something on a prescription blank, put it into an envelope and told the patient not to open it until he had left the office. He had written, "Go to a hardware store, buy a pair of scissors, and cut the damned string off!"

That pathologic diplopia may lead to severely neurotic behavior is illustrated by the following case.

#### CASE 10-2

A 32-year-old schoolteacher had experienced strabismus since infancy and had several surgical eye corrections performed during childhood. Wanting to regain normal binocular vision, he had read extensively about strabismus in public libraries. He underwent intensive orthoptic antisuppression therapy until finally he could use both eyes together, which resulted in constant double vision. Examination showed normal visual acuity in each eye, a minimal deviation that varied between esotropia and exotropia, and diplopia, which, according to the underlying deviation, varied between uncrossed and crossed localization of the images. Since he had no motor fusion, the patient was unable to superimpose the double images for longer than a few seconds. The patient requested to have one eye surgically removed because he was no longer able to work as a teacher as a result of the double vision. I suggested an occluding contact lens instead. The patient would not hear of this solution and consulted a colleague in another city who sent the patient to a psychiatrist. When I met this colleague several years later, I asked how our mutual patient was doing. He replied, "He no longer complains about diplopia; but then, since he began seeing his psychiatrist, he has stopped speaking altogether."

## Psychological Effects of Strabismus

The psychological effects of strabismus on the patient and, in the case of a child, on the parents should not be underestimated. Superstition and folklore that label a squinter as being "shifty-eyed," "evil-eyed," and "not to be trusted" and "apt to lie" are still strong in our allegedly enlightened world, especially in rural areas. The words for strabismus or squint have distinctly negative connotations in some other languages. For instance, the German word for squint is *schielen*, from the Greek *skollós*, "crooked," "dishonest" (see also *scoliosis*). An older and etymologically closely related German adjective is *scheel*, "be-

grudging," "envious," or *scheelsichtig*, "strabismic." To this day, the expression to look *mit scheelem Blick* is equivalent to looking at something "enviously" or "begrudgingly." In Yiddish the expression for strabismus is *krimme Augen*. *Krim* (or *krum*) also means crooked and is used for describing dishonest business. The French verb to squint is *loucher* and to this day a shady business deal is referred to as *une affaire louche*.

Cosmetically, strabismus is unacceptable in most societies; thus growing up with crossed eyes and looking different from other children, as well as being exposed to teasing and harassment from playmates, cannot help but have a negative impact on self-esteem and personality development in children afflicted with this condition. This was not always so. For instance, in the Inca culture esotropia was considered a sign of beauty and a small ball of beeswax was dangled before a baby's eyes to force the eyes into convergence. Many pictures of the ancient sun god show the eyes in a position of esotropia.

Strabismus not only may have a negative psychosocial impact on a child but may also affect the parent-child relationship. Many parents develop anxieties and guilt feelings about their child's eye condition, and further conflicts are caused by the parents' response to what others will think of their child's strabismus. These psychological problems and anxieties of the parents may be compounded by their participation in decisions regarding medical and surgical treatment of their child.<sup>1</sup>

That the psychosocial consequences of strabismus are not limited to childhood but occur in teenagers and adults as well was shown by Satterfield and coworkers,<sup>11</sup> who studied the psychosocial implications of growing up with a noticeable strabismus. This study showed that strabismus has an adverse effect on the afflicted person's livelihood, self-image, ability to obtain work, interpersonal relationships, schooling, work, and sports activity throughout life.

The negative experiences of an ophthalmologist<sup>3</sup> who was afflicted with strabismus during childhood are interesting reading in this respect and confirm Satterfield's findings.

Olitzky and coworkers<sup>8</sup> studied the effect on college students of computer-modified photographs in which the same person was shown with orthotropia, esotropia, and exotropia. Negative social and occupational prejudices were evoked by the photographs showing strabismus and it is reasonable to assume that such bias would have been

even more pronounced if the group surveyed had included a more diverse section of the general population.<sup>10</sup>

The many functional benefits derived from surgical correction of strabismus are reflected in a list of recent publications compiled by Kushner.<sup>9</sup>

The psychosocial effects of strabismus must also be considered in connection with the indications for its surgical correction<sup>5, 6, 12</sup> (see also Chapter 26).

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