

ARE THE OBJECTIVE FINDINGS IN REFRACTION WORK THE MOST ACCEPTABLE TO THE PATIENT?

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This paper reviews the factors which limit adherence to the prescription of correcting lenses indicated by objective tests.

None of us will deny that the objective test is the best method we have at our disposal for the correction of refractive errors, yet it does not agree with the subjective test in a large majority of cases. It does, however, diagnose the existing error and is an excellent guide for further examination.

It is a matter of personal preference just what instruments we use in doing retinoscopic work—whether we use a large or a small mirror, a gas or electric light. In the Infirmary I was taught to use the gas light, which gave a soft and diffuse light; but in later years I have used a special electric bulb with frosted globe under a hood fitted with diaphragms. This light gives a more distinct reflection and possibly one is better able to detect minute errors. To me the small mirror is more satisfactory than the large one, for the diameter of the reflection is not so large. Only a small portion of the reflection enters the pupil while the total reflection at one meter distance is about twice the diameter of the mirror.

The acuteness of observation of the movements of the retinal reflection and the neutralization of the same are all important, for if one is not extremely careful the rapid movement in slight errors may be overlooked, or even mistaken for a reversal. With such cases I have learned to make a very slow movement of the mirror and have gotten results. A high error can be more easily detected because of the slow movement of the reflection until we reach a point of neutralization to within 0.25 D., then extreme care must be exercised. With high plus errors it has been my practice to place weak

lenses in the frame at first, and creep up, rather than to place a strong lens at first which is more or less confusing.

In all cases of astigmatism the movement is greater in one meridian than the opposite; and when the difference is slight, or the axis irregular I place a weak minus lens in the trial frame to emphasize the movement and to approximate the axis. This practice has been satisfactory to me in numerous instances and I have not failed to determine, within a few degrees, the axis accepted by the subjective test.

I think we should not be dictated to as to just what cycloplegic we should use. Every ophthalmologist has his preference. In the last thirty years I have used them all, but prefer, as a rule, homatropin and cocain combined, tho with young children and very doubtful cases I prefer atropin. The former, however, is satisfactory if sufficient time is allowed for it to act.

For the past few years it has been my habit to determine the retinoscopic findings, first without, then with a cycloplegic. I then had a working basis to depend upon, and at the postcycloplegic subjective examination, I found the more comfortable and acceptable lens, or combination of lenses, were those more in keeping with the non-cycloplegic objective findings. For this reason I have been using a cycloplegic only in excepted cases beyond a certain age.

In known cases of weak plus error under a cycloplegic, especially when reflex symptoms persist, I have found it better practice to apply the lenses required as soon as possible, without the use of a miotic; and allow the

muscle to gradually relax under the influence of the lenses. I seldom use a miotic following cycloplegia except above certain ages; and in all suspected cases I never use a cycloplegic or even a mydriatic. With thousands of cases, I have never gotten an evil result, besides, the strained ciliary muscle has more time to rest. Without a cycloplegic or mydriatic, light thrown upon the retina at first produces a reflex contraction of the sphincter pupillae, and this effect is also produced by accommodation. But by persisting in the examination and allowing plenty of time, the pupil is seen to gradually dilate; probably due to a partial exhaustion of the reflex function. Under these conditions fairly true correction can be attained objectively, with cases in which cycloplegia is contraindicated.

In all hyperopes there is a corresponding degree of development of the ciliary muscle; and in all true myopes there is a corresponding degree of atrophy of the same muscle. In the first instance are we apt to underestimate the error and in the second instance we are liable to overestimate the error, without a working knowledge of the total error previous to a final examination.

In very many cases we cannot deduct one diopter from the total error in hyperopia, nor add one diopter to the total error in myopia—as is the rule; however careful the examination, and exact the distance of one meter from the patient may be; for the patient will not always accept these exact deductions or additions, and modifications are often required.

On the other hand I have had patients accept the exact total error determined with the retinoscope, even when the vision previous to cycloplegia was normal in each eye. For example, a woman 39 years old had vision, right and left, 6/6. Under cycloplegia, the vision was 6/10. The retinoscopic examination showed in the right eye horizontally, no movement; vertically, + 1.00 D.; in the left eye, horizontally, + 0.25 D.; vertically, + 0.75 D. She

accepted, right eye, + 1.00 D. cyl. ax. 90°; left eye, + 0.25 D. S. \subset + 0.50 D. cyl. ax. 90°. She wore these lenses with comfort until presbyopia approached.

Had I followed the rule she would have required right eye, -1.00 D. c. ax. 180°; left eye, -0.25 D. sp. -0.50 D. c. ax. 180°. It is needless to say that had I followed the rule the result would have been disastrous. Thirty-nine years is rather an unusual age at which I control the ciliary, but as this patient had neurotic symptoms combined with headache, and as astigmatism was evident and the vision normal with each eye, I concluded to use homatropin. The antecycloplegic and the cycloplegic findings were the same.

I have had other cases much younger, whose manifest and total error were the same. Several patients in this class had less than 6/10 vision in each eye, yet they were able to read fine print at ten inches.

It is not my purpose to discourage the application of the rule for the correction of errors of refraction, for very many cases of hyperopia will accept no other lenses than those that conform to the retinoscopic findings, less one diopter. The following is an example: A man 54 years of age with vision in each eye but 3/60. The reflection movements were neutralized in each eye: vertically, +4.50 D.; horizontally, +5.00 D. He accepted +3.50 \subset +0.50 cyl. ax. 180° in each eye which produced vision of 6/6. It has been my experience that the higher the error, the more often is this the case.

The lower errors are the most trying and patients less often accept the objective requirements; however, the astigmatic correction is accepted in full. Frequently when the movement is neutralized below one diopter, a plus lens is accepted.

It is these lower errors which cause so much reflex disturbance of the nervous system, headache, etc. They usually have normal vision, or even much better, without a lens; and the ciliary

muscle is constantly active. Some of our internists tell us we must "fit the nervous system" even at the expense of falling short of normal visual acuity. We all recognize the fact that the eye is a part of the nervous system and that the visual impression is recorded in the brain as it is received on the retina. Why then should we make a patient uncomfortable from the lack of normal vision, and thereby cause a greater call upon his reserve forces by effort to overcome the influence of a lens, when such effort can be avoided? We must not forget that many reflex nervous symptoms are due to other causes than uncorrected refractive errors—causes that may have been overlooked by the internist.

It has always been my purpose to correct the patient's vision to 6/6 or the normal point, if possible; and not infrequently the patient will have, under correction, 6/5 or even 6/4. I myself, at 62 years of age, have 6/5+ with a high, corrected mixed astigmatism. A weak plus added cuts my vision to below the normal point.

As a rule, our patients are intelligent people and know when the letters are clear and distinct. It is most aggravating, when on the application of a plus or minus lens, a patient says he does not know whether he sees better or not. Such persons have little or no decision with regard to the affairs of life in general. I have learned to know them after a few minutes' conversation. There is always an element of doubt in their minds, as to results, even before the examination has begun. They are often chronic neurotics. They have consulted all sorts of specialists in all departments of medicine, but have failed the Christian Scientist.

When the practice of medicine becomes a fixed science, such as chemistry and mathematics, then we can follow fixed rules, but not till then. The ciliary muscle and the accommodation reflex, together with a stable and well balanced mental and nervous system, are factors to be considered in good

refraction work; just as much as functional and pathologic factors. With such otherwise normal persons we have to allow for some action of the accommodation, according to the degree of its development. If a man is sick, however (aside from the need of glasses), his ailment should first be diagnosed and treated; for unless he is well he is in no condition to meet the physical requirements for vision.

Those of us who have had experience in general medicine would easily recognize a sick man. I have had two cases of so-called walking typhoid, who came to me for glasses for relief from headache; and I have referred back to physicians numerous cases of Bright's disease, tabes dorsalis, syphilis, and other diseases which required their services rather than mine.

Accommodation is influenced by menstruation, indigestion, constipation, etc., also by localized diseases of the throat, teeth, nose and sinuses. I not infrequently tell a patient to see his physician, and wait until he is well; then to come in for an examination of the eyes. Many of them whom I did not see for several months told me that after they got well, their vision gave them no further trouble.

Of course refractive errors do cause many reflex functional troubles, but they do not cause local or general disease nor toxic absorption. The best advice one of our internists has given us as ophthalmologists is, "not to think too much in terms of glasses," but rather to study the individual case as a whole. I think all intelligent ophthalmologists are doing this, and I believe that the dogmatic assertions of the extremist are fast dying out and becoming a thing of the past. Our minds should be as broad as our subject, for even the best of specialists in any department of medicine is liable to err.

The best vision obtained under certain conditions is unmistakable, but under toxic influences on the macular

fibers it is unsatisfactory, for it is often not two days alike. The etiology of such a case is often more trying than the refraction.

I am apparently drifting away from my subject, but the conditions mentioned are recognized factors, influ-

encing the subjective refraction from that of the objective.

There are two chief factors concerned in good refraction work: The physician who knows well his subject, and an intelligent patient who knows when his vision is at its best.