

INTRODUCTION

The recent explosion of computers into our lives, particularly in the business office environment, has created many unexpected problems relating to visual stress. Stanmerjohn, Smith and Cohen, 1981, demonstrated that improper control of the room illumination, glare, contrast, workstation design and proper viewing distance may contribute to visual fatigue while operating a video display terminal (VDT).

Laubli, Hunting and Grandjean, 1981, discovered these visual/ocular problems included fatigue, burning eyes, shooting pain, red eyes, eye pains, headaches, blurring of near vision and blurring of far sight. They also found the above symptoms were remarkably increased when compared with traditional office work. Similar complaints were also discovered by Dainoff, Hagg and Crane, 1981.

Such complaints are more likely to arise in a patient with an inherent binocular problem. If this is the case, special treatment may be needed such as orthoptics or prescribing special lenses.

In the following cases, we have demonstrated an alternative treatment method for accommodative/convergence dysfunctions. This alternative method was the use of a multifocal contact lens in situations where a reading add was called for to reduce near visual stress. The multifocal contact lens we used was the Silcon VFL* lens produced by Dow Corning Ophthalmics. This lens is a gas permeable hard lens designed

*These lenses are now produced by Conforma Labs, Inc. and are available in Silcon, parapera or pma materials.

with a spherical front surface and elliptical back surface. This design creates a gradual increase in plus power from the apex to the lens periphery. The add power is derived from the gradual flattening of the base curve while the front surface remains the same. This constantly changing power allows good vision at all distances. The design permits the lens to be fit as a spherical hard lens. No prism ballast or crescent is involved.

These cases are examples of people who had some inherent visual/ocular problem that was aggravated by increased nearpoint stress. In this case, VDT's.

Case

S.P was a 23-year-old white female who presented to our clinic with complaints of "eyestrain" while on the job. She worked as a full-time secretary and her duties commonly included many hours behind a VDT.

Examination revealed aided distance VAs of 20/15 for each eye with a refractive error of -2.00 -1.25 x 112 and -2.25 -0.50 x 110 right and left eye, respectively.

Phoric posture, using the Von Graefe technique revealed a near esophoria of 8^Δ and a gradient AC/A of 8/1. The use of a +1.00 DS add over her prescription decreased the near phoria to relative orthophoria.

Convergence ranges at near were x/22/14 and 12/24/18 at distance. Intermittent suppression of her left eye was occasionally elicited during the near convergence testing. Divergence ranges were 10/16/10 at near and 6/8/6 at distance.

Stereopsis at near was 100 seconds using the Titmus Fly.

Blur out on NRA was +2.25 and -1.00 on PRA.

Dynamic retinoscopy using the Bell technique was within normal limits. First "against" motion was seen at 17 inches with release at 18 inches.

Accommodative facility using ± 1.25 DS flippers and the near/far technique was within normal limits.

Accommodative amplitudes were within normal limits of about 12.00 D.

Based upon our findings, especially the near phoric posture and high AC/A ratio, we determined a diagnosis of

convergence excess (Griffin). Because she responded well to the use of a +1.00 D reading add, (reduced near phoria to orthophoria), we decided to try the *Silcon VFL* contact lenses as an alternative to spectacle bifocals.

Upon dispensing, the patient was determined to have a near esophoria of 8^Δ through her spectacles and orthophoria through the *Silcon VFL* contact lenses using prism neutralization static cover test. The patient was seen three times following dispensing. Follow up visits were approximately three days, six weeks and seven months. Subjectively, the patient reported a definite decrease in her nearpoint symptoms with no persistent headaches or eyestrain while wearing her lenses. Overall, she was very pleased with the visual comfort the lenses provided.

Case

S. H. was a 25-year-old female who presented to our clinic with a problem of headaches after doing nearpoint tasks^{for} about an hour. These symptoms began shortly after beginning a new job six months earlier. She was a full-time secretary with duties including extensive VDT operation.

Examination revealed aided distance VAs of 20/15 for each eye with a refractive error of $-0.50DS$ and $-0.25DS$ right and left, respectively.

Phoric posture, using the Von Graefe technique, revealed 2^{Δ} of exophoria at distance and 6^{Δ} of esophoria at near. Gradient AC/A was variable and ranged from 4/1 to 7/1.

Convergence ranges at near were x/30/24 and 20/35/6 at distance. Divergence ranges were 12/15/8 at near and x/10/6 at distance.

Stereopsis^{at Near} was 40 seconds but of poor quality using the Titmus Fly.

Blur out on NRA was +3.50 and -3.50 on PRA.

Dynamic retinoscopy using the Bell technique was 20/19 right and left.

Accommodative facility using ± 2.00 flippers, binocularly, was 13 cycles per minute with decay. The plus lenses were slightly more difficult to clear.

Accommodative amplitude was within normal limits of about 10.00 D OD, OS, OU.

Based upon the data accumulated, we determined S. H. to have a convergence excess problem as defined by Griffin.

Our plan of treatment was to include two possible phases. First, we prescribed flipper training, monocularly and then binocularly in an attempt to expand her vergence ranges. Since her symptoms began only six months previously, we thought this technique may work. The second phase of treatment, if the flippers failed, was to prescribe reading glasses for her near tasks.

We explained our plan to the subject and began the ± 2.00 flipper therapy. A follow-up appointment was scheduled in two weeks to assess the results.

At the two week follow-up visit it was determined that the flipper therapy had not helped adequately. So we prescribed $+0.75$ DS reading glasses on a loaner basis and scheduled a one week follow-up.

At the follow-up, the patient reported a noticeable improvement in symptoms while wearing the $+0.75$ reading glasses. At this point, she agreed to try the *Sikun VFL* contact lenses as an alternative to the reading glasses.

She was fitted, dispensed and seen on follow-ups of three days, three weeks and three months. The results were very positive. She reported a definite improvement in her nearpoint stress symptoms while enjoying the convenience of being able to see people across the room without having to remove the reading glasses.

DISCUSSION AND CONCLUSION:

When a patient is diagnosed as having a binocular dysfunction, many problems crop up when the treatment is considered.

When therapy or orthoptics is considered for example, we have to carefully educate the patient. The patient must not wonder: "What is really wrong?" or the infamous "Is there really anything wrong?" From this understanding, stems the most important facet of treatment--~~the~~ patient compliance. If the patient does not understand the problem, chances are they are not going to give 100%. In the case of children, lack of parent understanding and encouragement allows little chance of accomplishing successful results. The therapy quickly becomes monotonous and positive results are impossible.

When the question of a bifocal or reading glasses are brought into the plan of action, new problems are quickly discovered. Once again the question of patient education becomes so very important. You will find few parents agreeable to putting their child into bifocals when they do not understand the problem themselves.

Once the patients are convinced, they must overcome the embarrassment of glasses with "funny lines" across them. The proper use of the bifocal can also be a problem, especially in children. That is, will the child look through the add properly, take them off or "conveniently" lose them?

Single vision lenses can be used to help insure the proper use. However, this creates another problem as clear distance vision is compromised.

The use of a multifocal contact lens has the advantage of overcoming many of these problems. Patient education, although still important, is probably not as critical. You do not have to convince them to wear a cosmetically unpleasing aid when prescribing contact lenses. This is probably especially true with young adults who are more conscious of their appearance than children. Compliance is also greater in children as they will be unable to look around the aid or take them off once they are out of mom's sight.

Contact lenses also have an added advantage over single vision spectacles by eliminating the hassle of the "on again-off again" syndrome when the need to see across the room arises.

The cases we have presented will hopefully give some insight into the type of success you may experience using "bifocal" contact lenses. Although we do not consider this method the answer for everyone, we do feel many patients capable of successfully wearing a hard contact lens would be greatly benefited by such an alternative.