

Clinical & Refractive Optometry is pleased to present this continuing education (CE) article by Dr. Langis Michaud entitled **Bifocal Contact Lenses in a Young Patient with a High AC/A Ratio**. In order to obtain 1-hour of COPE-approved CE credit, please refer to page 276 for complete instructions.

Bifocal Contact Lenses in a Young Patient with a High AC/A Ratio

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SUBJECTIVE

MPT is a young 24-year-old law student. She uses near vision and is doing computer work for more than 8 hours a day. She was seen in April 2006 at the Clinique Universitaire de la Vision for her regular examination. At that time she was complaining about headaches that lasted for several months, especially when she had to do many hours of reading or close work. She also noticed a transient blur when looking at far from near. These problems began with the increased demand at near required by her new field of study. She has no other complaint. Her contact lenses are comfortable and can be worn for more than 14 hours a day without any discomfort, dryness or lens awareness. That was not always the case: other pHEMA materials she tried led to discomfort and ocular redness after several hours of wear. Her general health is good and she reported no contributory family ocular and general health history.

OBJECTIVE

- Contact lenses worn
 - Proclear (Omafilcon A)
 - Base curve: 8.2 mm
 - OD: -1.50 6/6 (20/20)
 - OS: -1.25 6/7.5+2 (20/25+2)
 - OU: 6/6+1 (20/20+1)
- Preliminary tests
 - 3 degrees of fusion present
 - Stereo: 30 sec of arc
 - Near point of convergence: 4 cm/7 cm
 - Accommodation amplitude: 16.50 D

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- Ocular movements
 - Smooth and complete in all gazes
- Refraction
 - OD: -2.00 6/6+2 (20/20+2)
 - OS: -2.25 -0.25 x 40 6/6+2 (20/20+2)
 - OU: 6/4.5 (20/15)
- Induced phoria at far
 - 1 eso x/12/8
- Jackson crossed-cylinder
 - OD: -1.50 (0.37 M)
 - OS: -1.75 -0.25 x 40 (0.37 M)
- Induced phoria at near
 - 7 eso x/14/2
- Accommodative convergence-to-accommodation (AC/A) ratio
 - 8/1 (plano: 5 eso; +1.00 3 exo)
- Negative fusional vergence
 - Normal
- Anterior segment
 - Within normal limits OU
 - No papillae nor neovascularization
- Fundi
 - ONH 0.2 x 0.2 OU
 - Central and stable fixation OU
 - Within normal limits OU

ASSESSMENT

- Based on the previous findings, the following diagnosis was made
 - Moderate myopia well compensated by contact lenses
 - Convergence excess
 - High AC/A ratio
 - Normal ocular health

PLAN

Convergence excess is characterized by normal distance phoria, esophoria at near, high AC/A ratio, and low or

normal negative fusional vergence. The incidence varies between 2% and 16% based on different studies. It is thought that this problem occurs when a small amount of hyperopia is present, and that accommodative compensation brings about excessive accommodative vergence.

In order to test this hypothesis, we performed a cycloplegic refraction, which led to the results we found initially. The small amount of myopic correction was then confirmed and the convergence excess was suspected as the major reason explaining the symptoms of ocular fatigue reported by the patient.

It is known that the main symptom linked to this binocular imbalance is the discomfort felt at near or during near work. Some patients even decompensate when the problem is sustained for several weeks, leading to an intermittent esotropia. We hoped this was not the case of this patient.

Treatment of convergence excess is directed at relaxing accommodation by modifying the distance correction toward less minus or more plus. If this solution is not possible, separate reading glasses can be prescribed. The use of prism is not recommended; orthoptics treatment failed to improve the imbalance.

In our case, reducing the minus correction at far was not considered since the patient had to read the board in class, and should see well at far for driving and other purposes. The patient wanted to continue wearing contact lenses. This solution increases the problem of convergence excess since the accommodative demand is higher in contact lenses than with glasses. Therefore, the only option remaining was to consider a reading prescription over the contact lenses. Our patient was not happy with the idea of wearing readers during her class activities so we decided to try another option: bifocal contact lenses.

We first determined the power needed at near to bring the AC/A ratio to a more normal level. An addition of +1.00 OU over the contact lenses gave us a ratio of 4/1, which was considered acceptable.

For the selection of the bifocal contact lens, we decided to remain with the Proclear material, which has proven its efficacy over time compared with others. Since there was no corneal warpage nor neovascularization, we had no need to look for hyperDK materials. The DK level of the Proclear material is sufficient to alleviate any adverse effect in a daily wear situation. Proclear multifocal lenses are a simultaneous-designed lens system including

a lens with a central zone for distance and a second lens with a central zone for near, with outer rings for distance vision.

We first determined the dominant eye, the right one, and fitted it with Proclear multifocal D lens (−2.00 add +1.00). For the left eye, we first selected Proclear N (−2.25 add +1.00). After several minutes of wear, the patient reported blurred vision at far, a kind of foggy perception which she evaluated as too disturbing. Clearer vision was obtained with an over-refraction of −0.75 on the left side. We decided therefore to move to a D lens on that side, keeping the same power (−2.25 add +1.00). Instantly, the patient reported improved visual acuity and was happy with the results. We measured our AC/A ratio with these lenses on and obtained a 6/1 result. We tried to increase the add power of the left lens up to +1.50, which gave us a 4/1 AC/A ratio as desired.

We let the patient go with these lenses on and scheduled her for a control examination one month later.

FOLLOW-UP

A month later, the patient reported a major improvement in her symptomatology. She was able to read more often for a longer period of time without experiencing headaches, asthenopia or transient blurred vision. Some days the symptoms returned after 6 to 8 hours of computer work. The lenses were as comfortable all day long as the previous ones.

Our clinical results were comparable with those of the previous visit. Visual acuities were optimal at far and near, and the AC/A ratio was evaluated as 4.5/1. We then decided to keep the lenses as prescribed as an appropriate solution for this patient.

CONCLUSION

Bifocal contact lenses are not designed primarily to address binocular vision problems. However, when a plus power is needed at near for a young patient, they are a viable option to consider.

In that case, we were able to prescribe bifocal contact lenses that compensated for a convergence excess that became symptomatic by a change in the near demand. This case illustrates the importance of considering a contact lens patient as a whole, and of keeping in mind that prescribing contact lenses can affect the binocular vision balance in certain individuals.