Myopia control: orthokeratology in children

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An 8-year-old patient presents in your exam chair. The child’s parents have greater than -6.00 diopters of myopia. Current glasses are -1.00DS OU. Cycloplegic refraction is -2.00DS 20/20 OU. Ocular health and clinical findings are otherwise unremarkable. What do you recommend?

a. Update spectacle Rx.
b. Update spectacle Rx with bifocal.
c. Recommend contact lenses.
d. Discuss the benefits of a myopia control device such as orthokeratology (OK).

While choices (a-c) are common clinical practice, choice (d) still remains a niche reserved for contact lens specialty practices. The question is if myopia control devices are the first step to effectively slow the disease state of myopia, why are these devices so underutilized?

Myopia control hypothesis

Research suggests that myopic elongation is caused by peripheral hyperopia, or focusing light behind the retina in the periphery. Researchers hypothesize that myopic elongation can be slowed by focusing light in front of the retina in the periphery, i.e. peripheral myopia. The thought is the retina will move to where the light is in focus, thus peripheral myopia will remove stimulus for the eye to elongate. Orthokeratology (OK) lenses are one device capable of creating such peripheral myopia.

Why orthokeratology?

- 75 percent of children can successfully wear OK lenses.
- Lenses are relatively easy to fit with manufacturer certification and support.
- OK provides clear vision all day without contact lenses or glasses.
- Safety comparable to overnight wear with SiHy soft lenses.
- Provides myopia control option rather than just simply correcting or masking progressive myopia.

The latest data

Pauline Cho’s initial research published in 2005 was one of the first to show that OK lenses slow axial elongation of the eye. Since then more data has surfaced.

- Kakita of Japan evaluated 92 children with an average age of 12 years. Children wearing OK lenses exhibited significantly less myopic projection and axial elongation vs. spectacle wears over two years.

- Hiraoka of Japan evaluated children over a five year span. Statically significant decreases were noted in axial elongation in the OK group during the first, second, and third years of the
The AOA’s CLCS Newsletter, August 2013

study. However, a statistically significant difference was not found in the fourth of fifth year of the study. Children wearing OK lenses exhibited no severe complications during the study.6

-Pauline Cho of Hong Kong concluded that children wearing OK lenses had a 43 percent slower increase in axial elongation compared to children wearing spectacles. Younger children showed faster axial elongation, and showed to have greater benefit.7

The key to success

Contemporary thinking suggests that OK lenses can slow myopia by 50 percent. Studies showing the greatest reduction in axial elongation are those that use younger children. In many ways successful myopia control is much like that of diagnosing and treating glaucoma, detect early and treat early. It cannot be emphasized enough that to maximize efficacy, myopia control devices need to be incorporated at the early onset of myopia.

It is an exciting time to practice during the birth and early evolution of modern myopia control devices. As more research and improved devices develop, we will place greater emphasis on controlling, halting, or even reversing myopia, rather than simply correcting myopia with optical devices. In the future, any answer to the above multiple choice question other than (d), could simply be malpractice, and possibly failure of a board exam!

References:


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