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Management of Long-standing Esotropia with Hypertropia in an Adult Patient

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INTRODUCTION

Large angle esotropias and hypertropias are often discovered in early childhood due to cosmetic concerns and symptoms. Symptoms of large angle strabismus can present themselves in many ways including lack of stereopsis, diplopia, and suppression, along with head tilts/turns and difficulty with schoolwork and sports. Esotropia is most often associated with moderate to high hyperopia. It is unusual for an adult myopic patient to present with these conditions undiagnosed.

CASE HISTORY

A 24-year-old female 2nd year optometry student presented to the clinic for her yearly eye exam with complaints of decreased binocularity and lack of depth perception while learning slit lamp and binocular indirect ophthalmoscopy techniques. Refraction revealed moderate myopia in both eyes, with slight overcorrection in her previous glasses. The patient was currently wearing, -5.75 -1.00 x 004 OD and -5.75 -1.25 x 179 OS. A 35 pd constant alternating esotropia at distance with a 40 pd constant alternating esotropia at near, and a 10 pd constant right hypertropia with a slight head tilt were measured. The patient displayed a lack of stereopsis, seeing zero forms with alternating right and left suppression. Worth 4 Dot revealed deep suppression of the right eye at all distances. Anomalous Correspondence was revealed with amblyoscope testing but no eccentric fixation or amblyopia exists. At near, 25 pd base out prism was needed to eliminate the suppression but the esotropia and hypertropia were still present. At distance, 40 pd BO were needed to eliminate the patient's suppression. The patient did not know she had an eye turn until having a comprehensive exam during her first year of optometry school, despite having worn glasses for many years prior to this exam. See Table 1 for Pertinent Exam Findings.

TABLE 1
Pertinent Exam Findings

Distance Visual Acuity	20/20 OD, OS
Near Visual Acuity	20/20 OD, OS
OD Refraction	-5.75 -1.00 x 004
OS Refraction	-5.75 -1.25 x 179
Cycloplegic Retinoscopy OD	-4.75 -1.00 X 005
Cycloplegic Retinoscopy OS	-4.75 -1.00 X 165
Distance Cover Test	35 pd CAET with 10 pd CRHypertropia
Near Cover Test	40 pd CAET With 10 pd CRHypertropia
Randot Stereoacuity	Negative
Worth 4 Dot Testing	OD suppression all distances, dark & light
Amblyoscope Testing	(+) for Anomalous Correspondence
Hering-Bielschowsky After Image Test	UTT alternating suppression
Minus Lens Amps	10.25 OD, 13.75 OS
MEM	Lead -0.50/-0.50 OD, OS
Prism added to W4D to eliminate suppression	25 BO at near, 35 BO at interm, 40 BO Dist

MANAGEMENT

Proper binocularity, fusion, and depth perception are important functions for many careers. Symptoms of large angle deviations can lead to visual limitations, affecting possible career options for the patient. In this patient, she was unable to properly use optometry equipment to fully perform her job as a future optometrist. Treatment options for a large angle strabismus involve vision therapy, glasses, prism, and/or surgery. Our patient was not interested in surgery since overall cosmesis was good. Vertical prism using Fresnel prisms was implemented but the patient felt no difference with or without the prism. The value of horizontal prism needed was too large at this time to be practical or effective. Thus, our patient decided to try a course of Vision Therapy with the primary focus of improving her vergence

ranges and decreasing her suppression. Therapy with the amblyoscope has been implemented to work on horizontal ranges in the amblyoscope while accounting for the vertical deviation. Positive results regarding the patient's suppression and vergence flexibility have been occurring with weekly Vision Therapy sessions as can be seen in Table 2. Use of Fresnel prisms both horizontally and vertically will be used to prevent diplopia as therapy continues. The patient understands the slow progress of the therapy and is very motivated to continue as evidenced in her own words in Table 3.

CONCLUSION

Binocular testing should be performed on all patients, regardless of cosmesis. Long-standing strabismus may be improved with vision therapy and the use of prisms to make the patient more comfortable and functional. Age should not be a limiting factor in initiating treatment including vision therapy and prism. In this case, vision therapy was the most appealing treatment method for our patient. Long-standing strabismus can be improved with proper techniques. Binocular vision testing is essential in enabling patients to achieve clear and comfortable vision.

TABLE 2
Amblyoscope Starting Results and Best Results With Varying Targets Over the Course of 12 sessions of VT (3 pd of vertical prism was dialed in at all times while using the instrument and the flashing light for suppression was often used.)

VT Session	Target Used	Base In Results(pd)	Base Out Results
Starting	Large Spider/Web	11/0	12/0
Best to Date		20/10	14/4
Starting	Medium Lion/Cage	26/20	20/8
Best to Date		30/22	20/8
Starting	Rabbit w flower/tail	12/6	15/3
Best to Date		14/6	16/4

TABLE 3
Patient Commentary

"Growing up I never categorized my eyes as 'strange' or 'abnormal'. Yes, I experienced the occasional blurry vision at distance, but this was met with some more minus lenses in my glasses and an education piece of 'come back in two years or sooner if anything changes.' I also never experienced the effects of 3D movies or the emersion of simulation rides/experiences but just assumed that was me not knowing how the glasses worked or that the effect of my glasses negated the 3D ones."

"My first year at ICO in the optometry lab would introduce the idea that maybe my eyes weren't as 'normal' as I thought. My poor lab partner's introduction to performing a cover test was with a large constant alternating esotropia and I couldn't assist because I, myself, was shocked. As the year progressed more skills were geared towards binocular vision such as vergences, phorias, AC/A ratio, etc. Many of these tests I realized I could not experience fully myself, and it became difficult to explain how the tests worked when I could not experience what was 'normal' such as the screens splitting into two and coming back into one on Risley prism vergences. While all these circumstances were categorized as strange overall, I still had no signs or symptoms, so I went about my time at school."

"Second-year changed the story and with the introduction of skills such as slit lamp, tonometry, and BIO the reality of being a strab hit hard. My frustrations grew with constant suppression on the skills as well as a lack of depth perception and stereo. I learned that I had to perform skills differently and adjust. With this realization, vision therapy was recommended. As my time in VT has progressed, I have slowly noticed more and more signs such as my eyes drifting as I hold a conversation with someone, tilting my head to the side as I write, or even small things like how it takes me a couple of attempts to put a knife in a knife holder. When I mention I am in VT to colleagues, upperclassmen, and professors many are shocked at how asymptomatic I am for such a high horizontal and vertical deviation. I have also had many individuals ask for my goals in VT along with my doctor Dr. Allison. Answering this question is difficult since coming into VT I never expected to have goals, I mainly just wanted answers. I'd like to say my goal is just to see 'normally' or as normal as I can but seeing as how I have never experienced 'normal' vision that would be hard to imagine or strive for. I also believe this goal is unrealistic at least for now. As of right now, I am enjoying the experience of learning new things as well as increasing my knowledge and I am happy just seeing how far VT will take me and how/if I can improve."

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