



Diagnosis and Vision Therapy Management of Accommodative Excess: A Case Study

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Abstract

Accommodative Excess (AE) presents challenges in diagnosis and management, often leading to symptoms like headache, asthenopia, and blurred vision. This case study presents the diagnosis and management of AE in a 24-year-old male bank teller presenting with strain, fatigue, and ocular discomfort. Clinical findings revealed myopia with astigmatism and signs consistent with accommodative excess. Management involved correct prescription glasses and a tailored vision therapy regimen spanning multiple sessions and weeks. Vision therapy included monocular and binocular exercises targeting accommodation and vergence. The patient showed improvement over the therapy period, highlighting the efficacy of vision therapy in addressing AE. This case underscores the importance of accurate diagnosis and personalized treatment in managing accommodative dysfunctions.

Keywords: Accommodative Excess; Vision Therapy; Diagnosis; Management; Case Study

Introduction

Accommodative Excess (AE) presents a range of symptoms, including headaches, asthenopia, and blurred vision, especially after performing near tasks [1]. Diagnosing AE can be intricate without the aid of cycloplegic drugs. However, various clues obtained from comprehensive eye examinations contribute to a more accurate diagnosis. The primary treatment approach for AE involves correcting refractive errors and implementing vision therapy protocols if symptoms persist, aiming to restore optimal visual function [2].

Case Presentation

In this case study, a 24-year-old male bank teller presented with complaints of ocular strain, fatigue, itching, and a foreign body sensation, devoid of any significant medical history. Clinical examination revealed myopia combined with astigmatism, along with indications suggestive of accommodative excess. Consistency in findings across multiple diagnostic tests further supported the diagnosis.

Clinical Findings

The patient exhibited good visual acuity but with associated blur and strain. Cover tests demonstrated esophoria both at distance and near fixation, indicative of excessive accommodation [1]. Retinoscopy and subjective refraction affirmed the presence of myopia and astigmatism. Notably, the near point of accommodation (NPA) was reduced, while monocular and binocular flipper tests highlighted signs of accommodative excess [1]. Despite these findings, the amplitude of accommodation remained within normal limits.

Detail below:

- Aided VA (OD and OS): 1.0 with strain and blur.
- Cover Test CT (aided with old prescription): 2 Esophoria at far, 8 Esophoria at near.
- Retinoscopy (OU): 95° -0.75 -2.50 Sph VA 1.00 (with strain).
- Subjective refraction findings OU: 95° -0.75cyl -2.50 Sph VA: 1.0 with strain and fluctuating.

- CT is the same as with his glasses.
- NRA/PRA: 2.00/-3.75 Sph.
- Flipper monocular: 3.5 cpm not with plus lens.
- Flipper binocular: 10 cpm slow with a plus lens.
- Amplitude of Accommodation: 9.00 D in both eyes with Donders.

Case analysis

Fluctuating or strain in distance vision (no comfortable clear vision). Fatigue at work and Itchy eyes are consistent with accommodative issues, then foreign body sensations may be symptoms associated with the effect of prolonged contact lens wear. Old prescription reveals that he has: Myopia with against the rule astigmatism (characteristics of accommodative excess). CT reveals more Eso in near compared to far; more than 6D (2E, 8E') which is due to accommodative excess (the optical correction did not relax his accommodation at far and also stimulated excessive accommodation at near). Subjective findings (myopia) is higher than Retinoscopic findings which reveals the sign of pseudomyopia associated with accommodative excess. No change to the CT findings with the new prescription because it is essentially the same as the old prescription. Reduced NRA and Slightly high PRA: suggestive of accommodative excess. Very low flipper mono: 3.5 cpm not with plus lens: also suggestive of accommodative excess. Binocular flipper:

10cpm slow with plus lens: also suggestive of accommodative excess. Normal AA: 9.00D in both eyes with Donders which is typical of accommodative excess.

Diagnosis and management plan

Cycloplegic Refraction was done to reveal the correct prescription. Low monocular estimated method or fused cross-cylinder finding. The value of the base-in blur point in near vision was low.

Based on the constellation of symptoms and clinical findings, a diagnosis of accommodative excess was established. The initial management plan involved prescribing corrective lenses (glasses or contact lenses) tailored to the refractive error. Subsequently, a comprehensive vision therapy regimen was initiated, comprising a series of monocular and binocular exercises targeting accommodation and vergence anomalies [2].

Vision therapy method

The vision therapy protocol spanned multiple sessions over several weeks, progressively advancing from basic monocular exercises to more complex binocular tasks. Regular evaluations and adjustments ensured the optimization of therapy efficacy, with a focus on enhancing accommodation and vergence functions [2].

Vision Therapy Method			
Session	Week	Session in the office or clinic	Session at home
1	1	Four monocular exercises are taught and performed: Positive lens with a dartboard with letters. Dartboard with letters and Hart chart. Marsden ball with a negative lens. Monocular flipper ±2.00D with letter dartboard.	An information sheet is delivered with the necessary material to carry out the exercises.
2	2	The previous exercises are performed in order to verify that he is performing them correctly. Vergence facility exercises are taught and performed with computer applications, anaglyphs, and Wheatstone stereoscope	Monocular exercises are maintained.
3	4	Monocular exercises are performed in order to verify that he is performing them correctly. The same vergence facility exercises are performed with computer applications, anaglyphs, and Wheatstone stereoscope	Monocular exercises are maintained.

4	6	Accommodative facility control with the previous four exercises. The exercises are withdrawn if performed without difficulty.	Monocular exercises that are performed with difficulty are maintained and combined with binocular flippers and computer applications (Visionary®).
5	8	Exercises performed at home are checked. Exercises with apertures, vectograms, and letters with transparent lenses and prisms are performed.	The binocular flipper and monocular exercises are stopped if performed correctly. Central anaglyphs and computer applications (Visionary®)
6	10	Previous exercises are checked, and Brock strings with prisms are added	Central anaglyphs exercises are stopped. Apertures with flippers are included and the other exercises are maintained.
7	12	Aperture and vectogram exercises are performed with flippers.	Binocular exercises that are performed with more difficulty are maintained.
8	14	A complete optometric binocular vision evaluation is performed to assess the improvement of the visual system function. If the Accommodative Excess is solved, then he is checked again in 3 months. If the problem persists, the vision therapy protocol is extended for 4 more sessions (two months).	If it is necessary to continue, the binocular exercises that are performed with more difficulty should be maintained
9-11	16-20	The exercises with which he has the most difficulty will be performed.	Binocular exercises that are performed with more difficulty are maintained.
12	22	A complete eye examination and binocular vision assessment are performed to assess the improvement of the visual system function. If the Accommodative excess is solved, then he is checked again in 3 months. If the problem persists, the therapy is considered to be a failure and other treatment or professional help will be considered.	

Table 1

Discussion and Conclusion

Accommodative Excess (AE) is an accommodative dysfunction that is characterized by symptoms such as headache, asthenopia, and blurred vision after completing tasks at near distances. Diagnosing AE can be difficult without cycloplegic drugs because many optometrists around the world usually do not use cycloplegic refraction. However, it is possible to find some clues from optometric exams that suggest a diagnosis of AE, such as variable visual acuity findings, variable static and subjective refraction findings, low monocular estimate method or fused cross-cylinder findings, low negative relative accommodation values, high positive relative accommodation values or failure of the monocular and binocular accommodation values or failure of the monocular and binocular accommodative facility with +2.00 Diopters (D) [1,3-5] pseudomyopia is also considered a variable sign of accommodative excess [6]. In all accommodative and vergence dysfunctions, the first option of treatment must be the correct refractive error prescriptions, even for mild refractive errors. If the dysfunction still persists, sometimes vision therapy can be the primary treatment method [7]. A correct diagnosis of accommodative or vergence dysfunction and a

correct prescription for the refractive error are necessary to choose a suitable combination of exercises for vision therapy. A wrong combination of exercises could lead to the failure of the vision therapy protocol, even when it is the first option for treatment [8]. The goal of vision therapy is to restore the balance in visual functions in order to lessen the symptoms during habitual visual activities [2].

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