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Unilateral accommodative spasm arising upon stress

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ABSTRACT

We present a young male patient with a 2-day history of vision loss and left eye pain. Refraction showed right eye was emmetropic, while the left eye had a refractive diopter measurement of -4.50. After the administration of mydriatic drops, an emmetropic measurement was performed in both eyes, and the patient's pain decreased. Being a military student and undergoing annual eye examinations suggested that the change in refraction was indicative of an acute problem. Repeat measurements and dynamic pupil analysis were conducted along with A-mode ultrasound. Mydriatic drops and eyeglasses were prescribed. Psychiatric consultation was recommended due to the patient's statements regarding anxiety. His symptoms regressed, and his vision improved excellently.

Introduction

Typically, accommodation spasm is caused by prolonged contraction of the ciliary muscle due to prolonged close viewing. Pseudomyopia may occur in accommodation spasm, which is different from myopia because there is no deterioration in the eye anatomy (1). It is common among students preparing for exams or working with a digital screen. There is an organic cause in 18-25% of cases (2,3). Its association with anxiety, depression, neurological diseases, and head trauma has been previously reported (4-7).

Case Presentation

A 20-year-old man with no significant medical history was admitted to the eye clinic with symptoms in the left eye, including pain, blurred vision, decreased visual acuity, and headache. We conducted a comprehensive ophthalmologic assessment, including visual acuity, pupillary response, ocular motility, anterior and posterior segment evaluations and intraocular pressure measurements. Retinal nerve fiber layer (RNFL) analysis (RNFL; OCT, Heidelberg, Germany), dynamic pupillometry (OPD-Scan 3, Nidek, Japan), and A-mode ultrasonography (USG) were performed.



We informed the patient about this case presentation and obtained his informed consent.

His eyes were orthotropic, and his visual acuity was complete without correction in the right eye and 0.2 (Snellen) in the left eye. Refraction was -0.25 diopters (dpt) in the right eye; -4.50 dpt myopia was detected in the left eye. Pupillary light reactions were natural, but the left eye was more miotic than the right. Slit-lamp and fundoscopic examinations were not affected in either eye. The eye pressure was 15-16 mmHg. In the examination performed with a dynamic pupillometry device, the right eye pupil diameter was 2.70 mm in the photopic environment, while the left eye pupil diameter was 2.48 mm; for the mesopic environment, the pupil diameter was 5.89 mm, and the pupil diameter was 3.47 mm (Figures 1, 2). Both eyes were -0.25 dpt on refraction examination performed after a 1.5% drop of cyclopentolate HCL. With A-scan USG, the axial lengths of the right and left eyes were 23.00 and 23.20 mm, respectively.

Since no other pathology was detected in the tests and repeated examinations, unilateral accommodation spasm was considered in the left eye, and neuroradiological imaging was performed for possible causes. Contrast-enhanced brain and orbital magnetic resonance (MR) examinations were normal. Tropicamide 0.5% drops were prescribed as the initial treatment. After 1 week, because of persistent symptoms in the left eye, the treatment was switched to cyclopentolate HCL 1.5% drops, administered twice daily.

The patient stated that he had recently been experiencing stress due to school/exam anxiety. Based on his statements,

a psychiatric evaluation was recommended without subjecting him to any stress test. It has been reported that antidepressant treatment recommended by a psychiatrist for anxiety was rejected by the patient but was continued with psychotherapy sessions.

During the follow-up period of up to 6 months with intermittent topical drops treatment and psychotherapy sessions, the patient's complaints were resolved, vision was full in both eyes, and the pupils were isochoric and of normal size.

Discussion

Unilateral accommodation spasm is an extremely rare clinical manifestation in the available literature. The largest series in the literature included 17 cases (3), which reported symptoms of blurred vision (71-100%), diplopia (62%), headache (24-56%), ocular pain (37-47%), and photophobia (24%).

There are different recommendations for the treatment of accommodation spasms. The integration of plus lenses and orthoptic exercises proved successful in a 6-year-old girl with a history of esotropia, which had been previously managed with hyperopic correction (4). The patient was free of any diseases or trauma history and experienced a sudden onset of severe headache, blurred vision, diplopia, and esotropia following the death of her grandfather. Upon examination, her left pupil exhibited marked miosis, and alternating myopic refraction was noted upon retinoscopy. Despite previous examinations consistently showing a refraction of +5.50 dpt in both eyes, she was diagnosed with accommodation spasm. To counteract

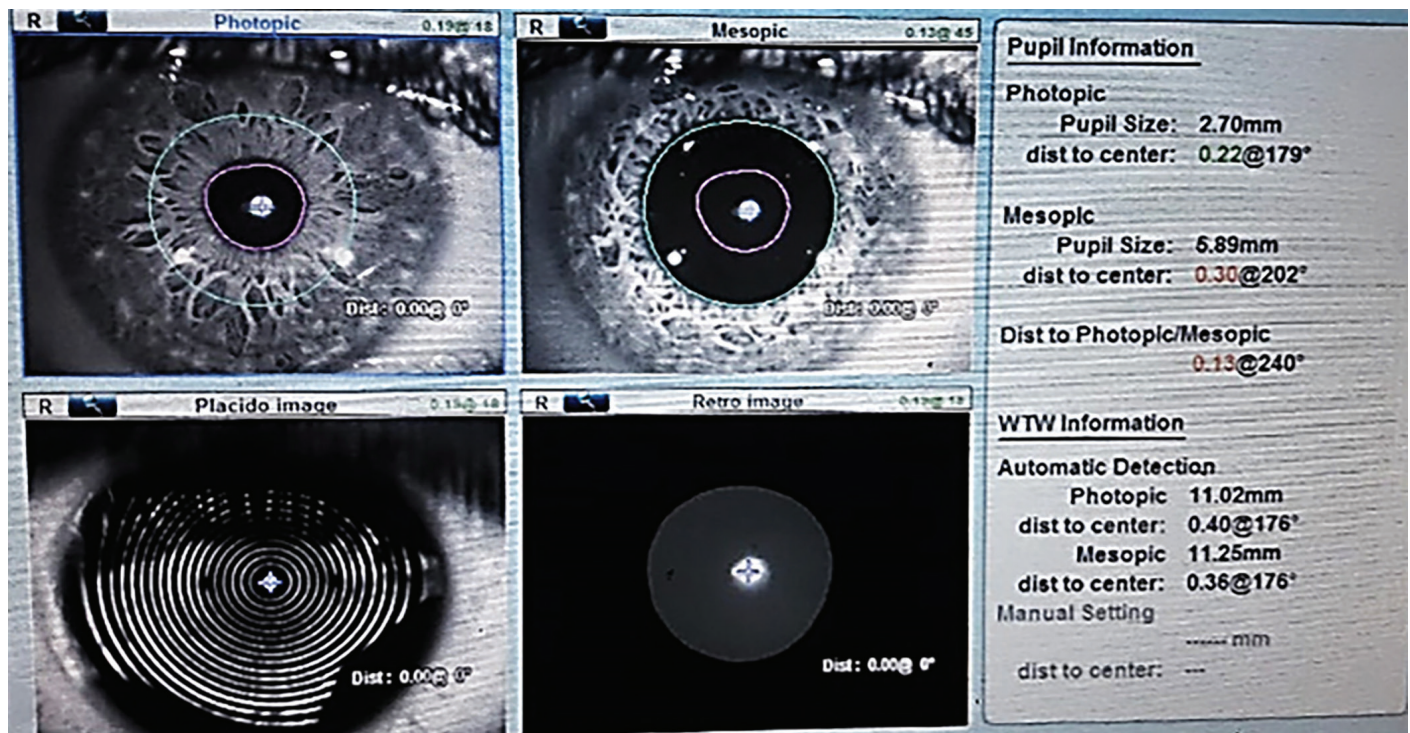


Figure 1. OPD scan 3 images of the right eye: photopic pupil, 2.70 mm; mesopic pupil, 5.89 mm in diameter

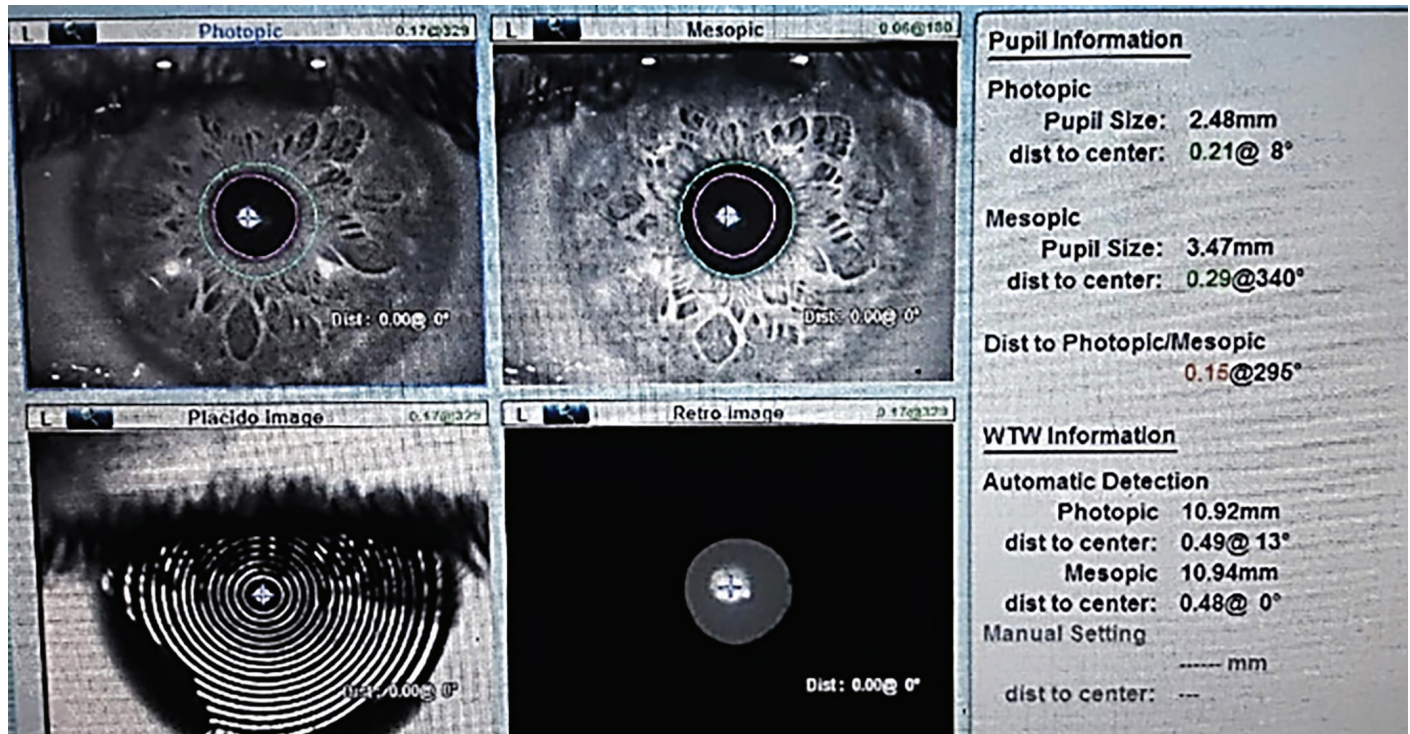


Figure 2. OPD scan 3 images of the left eye: photopic pupil 2.48 mm, mesopic pupil 3.47 mm in diameter

the accommodation, Fresnel press-on bifocal lenses of +2.50 dpt were applied to the patient's spectacles. Remarkably, the patient experienced spontaneous recovery within 2 months, underscoring the effectiveness of the intervention.

Murrah reported an 18-year-old female patient who developed unilateral accommodation spasm after a traffic accident in 1965 (5). In the current case, unilateral accommodation spasm is the expression of increased parasympathetic activity or decreased sympathetic activity due to possible ciliary ganglion trauma.

A 34-year-old female patient who developed sudden-onset blurred vision in her right eye after a car accident was also reported (6). There was no damage during examination or MR imaging. The patient was prescribed glasses -3.50 dpt for the right eye.

Various treatments were given to 16 patients with accommodation spasm (7). Atropine drops were administered to 7 patients, and improvements were observed in these patients. To treat accommodative spasms, we recommended myopic negative lenses to 10 patients, which led to significant improvements in vision quality and reduced complaints in all cases. Four patients who did not receive any treatment exhibited spontaneous recovery. These findings demonstrate the effectiveness of mydriatic drop application and myopic negative lenses in the treatment of accommodation spasms.

Botulinum toxin was applied to the medial rectus muscles, but no improvement was observed in symptoms or visual acuity

(8). This report highlighted the rare occurrence of long-term functional accommodative spasms. The study also emphasized the importance of considering functional causes when organic reasons are ruled out. Correction of refractive errors and cycloplegic drops were recommended for symptom relief. Furthermore, the importance of psychological support was underscored.

In the current case, 1.5% cyclopentolate HCL drops were initiated to treat the accommodation spasm. To enhance visual acuity, plano lenses were prescribed for the right eye, while the left eye was corrected with 1.5-dpt myopic lenses.

Previous studies have underscored the importance of psychological support for these patients (8,9). Psychotherapy was beneficial for the current patient.

Conclusion

Unilateral accommodation spasm is a rare condition that often suggests an underlying potential organic pathology. It is important to exclude organic causes before evaluating functional etiologies. In addition to correcting refractive errors, comprehensive ophthalmological evaluation is required. The use of cycloplegic agents may relieve symptoms. In functional accommodation spasms, psychological support and patient assuring that their condition is temporary and treatable are important throughout the treatment process.

Ethics

Informed Consent: We informed the patient about this case presentation and obtained his informed consent.

Footnotes

Authorship Contributions

Concept: B.A.Ç.İ., Ö.A., Y.U., Design: G.Ö., Data Collection or Processing: B.A.Ç.İ., Analysis or Interpretation: B.A.Ç.İ., Ö.A., G.Ö., Y.U., Literature Search: B.A.Ç.İ., Writing: B.A.Ç.İ.

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