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## Charles Bonnet Syndrome Associated with Glaucoma in a 95-Year old Female: A Case Report

### 95 Yaşında Kadında Glokom İlişkili Charles Bonnet Sendromu: Olgu Sunumu

Elif PARLAK<sup>1</sup> , Suleyman Emre KOCYIGIT\*<sup>2</sup> 

<sup>1</sup> Balıkesir University Health Education and Research Hospital, Department of Internal Medicine, Balıkesir, Türkiye

<sup>2</sup> Balıkesir University, Faculty of Medicine, Department of Geriatric Medicine, Balıkesir, Türkiye

**Abstract:** Vision problems increase with age and evaluation of visual perception is important in geriatric practice. Visual hallucinations may occur in elderly individuals for various reasons. Although they are primarily seen in delirium and dementia processes, they can also be drug-related. Hallucinations secondary to loss of severe visual acuity or visual field, also known as Charles Bonnet Syndrome (CBS), may be rarely seen. We reported a case of CBS secondary to glaucoma in a 95-year-old female patient. It is stated that this patient's visual hallucination has been developing for the last 3 years. The patient had simple hallucinations that were not related to dementia or psychotic disorder. The patient had accompanying depressive mood and fear of being alone. Visual hallucinations decreased after antidepressant treatment. The oldest known case of CBS is presented.

**Keywords:** Charles Bonnet syndrome; Aging; Depression; Visual hallucinations; Glaucoma

**Özet:** Görme ile ilgili problemler yaşla birlikte artar ve geriatri pratiğinde görsel algının değerlendirilmesi önemlidir. Yaşlı bireylerde çeşitli nedenlerle görsel halüsinasyonlar ortaya çıkabilmektedir. Ön planda deliryum, demans süreçlerinde görüldüğü gibi ilaç ilişkili de olabilmektedir. Charles Bonnet Sendromu (CBS) olarak da bilinen ileri derecede görme keskinliği veya görme alanı kaybına bağlı halüsinasyonlar nadiren görülebilmektedir. Biz 95 yaşında kadın hastada glokomun neden olduğu CBS olgusunu bildirdik. Bu hastanın son 3 yıldır görsel varolanlarının geliştiği ifade edilmektedir. Hastanın demans veya psikotik bozuklukla ilgisi olmayan basit halüsinasyonları mevcuttur. Tabloya depresif duygu durumu ve yalnız kalma korkusu da eşlik etmekteydi. Antidepresan tedavisinden sonra görsel halüsinasyonlar azalmıştır. Bilinen en yaşlı CBS vakası sunulmuştur.

**Anahtar kelimeler:** Charles Bonnet sendromu; Yaşlanma; Depresyon; Görsel halüsinasyonlar; Glokom

Corresponding Author: Suleyman Emre Koçyiğit e-mail: [suleymanemrekocyigit@gmail.com](mailto:suleymanemrekocyigit@gmail.com)

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## INTRODUCTION

CBS is a disorder characterized by visual hallucination with visual changes, such as decline in visual acuity or visual field loss due to any pathology affecting the visual pathway (Jan & Del Castillo, 2012). The syndrome was first described by the Swiss philosopher Charles Bonnet (1720-1793) in 1769. This syndrome was officially named by Monsier in 1936 (Pang, 2016). Visual hallucinations vary from simple to complex hallucinations. The content of hallucinations is in the form of well-defined and clear images (El Haj et al., 2017). Attacks of visual hallucination last from a few seconds to several hours, and recurrent episodes of visual hallucination occur for days to years (Kester, 2009). Since patients do not have a loss of insight, they are reluctant to tell their relatives or caregivers about their hallucinations for the fear of being labeled having a psychotic disease (Pang, 2016).

Ocular pathologies are at the forefront in its etiology and these include macular diseases, retinal diseases, amblyopia, glaucoma, cataract, central retinal artery occlusion, central retinal vein occlusion and uveitis (Pang, 2016). Other potential causes of visual hallucinations include retinal diseases, migraines, epileptic seizures, Lewy body dementia, Parkinson's disease, alcohol withdrawal or toxicity, metabolic encephalopathy, delirium, various medications, and psychiatric disorders (Schadlu et al., 2009). Although CBS is more common in individuals over the age of 65, it can also be seen in individuals even under the age of 40 (Elflein et al., 2016).

CBS, which regressed after antidepressant treatment in a nonagenarian patient with open-angle glaucoma, is presented in this case report.

## CASE PRESENTATION

A 95-year-old woman, has five children, applied to our geriatric outpatient clinic with disability, visual hallucinations, forgetfulness and a fear of loneliness. She has had bilateral visual acuity loss due to open-angle glaucoma for fourteen years and has been complaining about visual hallucinations for three years.

Hallucinations included smiling human faces on curtains and cats walking on the carpet. There are no auditory hallucinations. Dementia was not considered in the patient, whose daily living activities were understood to be affected not due to cognitive dysfunction, but due to physical limitations. It was highlighted that hallucinations were not accompanied by REM sleep behavior disorder and parkinsonism. It was stated that the patient, who felt fear of being alone, particularly, and fear of death, cried frequently during the day. She also reported balance issues and headaches.

The patient had diagnoses of cataracts, glaucoma, hearing loss, and hypertension, with no history of surgery. Medications included mirtazapine 15 mg/day, lansoprazole 30 mg/day, and a combination of valsartan-hydrochlorothiazide 160/12,5 mg/day. Physical examination revealed intact personal orientation but impaired spatial and temporal orientation. Yesevage Geriatric Depression Scale (YGDS) score was 7/15 and Mini-mental State Examination (MMSE) score was 24/30. Blood pressure was measured at 159/88 mmHg. Laboratory tests showed mild anemia, elevated sedimentation CRP, and deficiencies in iron and vitamin D.

With the current findings, dementia was excluded. She was diagnosed with CBS and geriatric depression. Citalopram, a selective serotonin reuptake inhibitor, was prescribed to her. He was called for follow-up 6 weeks later. In the follow-up evaluation, her caregiver reported that the mood was better and her hallucinations significantly decreased. Her YGDS score at follow-up was 3/15. The patient's follow-up and treatment continued in the geriatric outpatient clinic.

## DISCUSSION

CBS is a condition characterized by visual hallucinations that occur as a result of problems with visual pathways without a neuropsychiatric disease (Le et al., 2022). Although it was stated that it was more common in the elderly when this syndrome was first described, it can actually be seen at all ages, as there is no age-related limitation and it develops as a result of visual

acuity or visual pathway pathologies (Wilkinson, 2004). The reason why it is more common in the elderly is thought to be related to the fact that vision problems are more common in older adults. To the best of our knowledge, the present case is the oldest CBS in the literature, considering both the age of onset and the age of occurrence. In general, visual hallucinations are simple, well-defined, and patients are often unaware of unreality of visual hallucinations (Pang, 2016). In this case, the hallucinations are well defined and can be considered as simple hallucinations.

The pathogenesis of CBS is not clearly known. Several theories are expressed, these include sensory deprivation-phantom vision, theory of perceptual release, the neuromatrix theory, social isolation, senescence, psychological factors and cerebral perfusion theory (Jones et al., 2021). The most accepted of these is the phantom limb pain theory. Based on the theory of feeling pain in that area even if a painful limb is removed, an attempt is made to explain the reason for being able to see objects even if there is vision loss (Subedi & Grossberg, 2011). Etiological reasons are quite numerous and all pathways related to vision can be included. In older adults diabetic retinopathy, glaucoma, cataract, age-related macular degeneration, occipital infarction, and optic neuritis secondary to temporal arteritis can be mentioned among the causes of CBS (Teunisse et al., 1996). Additionally, social isolation or major depression may also contribute to the development of CBS (Caamaño-Ponte et al., 2021). In the present case, the increase in visual hallucinations, especially after social isolation and fear of death and loneliness, and the regression of hallucinations with antidepressant medication, suggest that psychological factors in addition to vision loss may also contribute to the development of hallucinations.

When visual hallucinations develop in elderly individuals, dementia or psychotic disorders should be considered in the differential diagnosis. Patients diagnosed with dementia with Lewy bodies may frequently present with visual hallucinations in older adults. These patients may often be accompanied by

cognitive dysfunction, parkinsonism, REM sleep behavior disorder and clinical fluctuation (Sanford, 2018). In the literature, it is stated that CBS can be misdiagnosed as dementia with Lewy bodies and it is essential to distinguish these two diseases in the differential diagnosis (Kaya et al., 2020). Psychotic disorders can also present with visual hallucinations, but unlike CBS, auditory hallucinations or organized delusions accompany the picture (Fischer et al., 2022). Visual hallucinations associated with levodopa, used in Parkinson's disease, are frequently observed (Banerjee et al., 1989). Although there is no known treatment for CBS, the underlying visual pathology must be corrected. Although the effectiveness of antidepressant drugs in the treatment of CBS is not clear, it is claimed that venlafaxine and escitalopram may regress secondary hallucinations in CBS at the case level (Bergman & Barak, 2013; Lang et al., 2007). It is thought that serotonergic pathways are affected in the pathogenesis of visual hallucinations. In addition, the transmission of visual information converging in the lateral geniculate nucleus to the visual cortex is regulated by serotonergic projections from the brainstem nuclei (Seeburg et al., 2004). These pathophysiological mechanisms may support the regression of CBS symptoms with antidepressant treatment.

In this case report, a case of CBS secondary to glaucoma in a nonagenarian female patient is presented. To best our knowledge, this patient is the oldest CBS person in the literature.

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