# Obsessive-Compulsive Disorder and Chiari Malformation: a Case Report

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## Abstract

*Obsessive compulsive disorder is a common psychiatric disorder that severely disrupts functionality due to obsessions and compulsions. An attempt has previously been made to explain the disorder with the psychoanalytic theory and fixation to the anal period but studies on the neurobiology of obsessive compulsive disorder have gradually gained importance in recent years and important findings have been reported. The Chiari malformation is a congenital malformation that emerges with a shift in the structures developing from the hindbrain towards the vertebral channel. It is more commonly seen in women and the etiology is thought to be multifactorial. There are some case reports showing that Chiari malformation and anxiety disorders can exist together. We present a case with obsessive compulsive disorder and Chiari Type 1 malformation comorbidity in this article.*

**Keywords:** Chiari malformation, obsessive compulsive disorder, comorbidity

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## Introduction

Obsessions are compulsive, repetitive thoughts, impulses or images. Behavioral or mental activities usually developing as a response to obsessions, aim to decrease the anxiety for a short time and which the person cannot prevent himself from doing are called compulsions [1]. Research on the neurobiology of obsessive compulsive disorder (OCD) has gradually gained importance in recent years with many studies focusing on neuroanatomical models and revealing important findings [2,3].

The Chiari Malformation (CM) is a congenital brain malformation due to the structures developing from the hindbrain (brainstem and cerebellum) shifting towards the vertebral channel (herniation) [4]. It is especially common in the western society. The female/male ratio has been reported as 2-3/1 [5]. Some studies suggest that certain factors such as high temperature, mechanical factors, craniosynostosis, chemical factors, genetic factors, and environmental factors play a role in the etiology [6].

Chiari Type I malformation is the congenital form characterized by the herniation of cerebellar tonsils downwards from the foramen magnum. Chiari Type II malformation is the herniation of not only the tonsils but all content of the posterior fossa from the foramen magnum. Chiari type III and type IV malformations are rare forms [7].

Case reports showing the possible comorbidity of Chiari malformation and anxiety disorders are present [8,9]. However, we did not find any case report on the comorbidity of Chiari Type I malformation and OCD in our literature review. We present a Chiari malformation accompanying OCD symptoms and found during the evaluation conducted for neurological findings in a patient in this article.

## Case

Our patient was a 22-year-old, single, male university student. He presented to the psychiatry outpatient department with symptoms of irritability, insomnia and disturbing thoughts. He was not able to deal with these ideas even though he knew that they were ridiculous and unnecessary. He felt unsure of what he was doing (and wanting to confirm by doing them repeatedly) recently. He was not sure that he had lit his cigarette and was lighting it twice. He came back after passing through a road and went through it again. His symptoms had started 2

years ago for the first time. There was simultaneous headache and balance loss during that period. He first presented to the neurosurgical outpatient department for headaches. He had been told that there was no pathology on the physical examination and imaging tests (computed tomography). He presented to the psychiatry outpatients department after 2 years following an increase in his obsessions. The headache and balance loss continued occasionally.

Compulsions of control, getting validation-approval, repeating the tasks for a certain times were noted in the initial interview. His appearance was as expected for his age, his clothes and self-care were consistent with his socio-economic situation, and his self-care had partly decreased in the initial mental status examination conducted. The emotions and mood of the patient were thought to be anxious and the cognitive functions to be normal. His thoughts contained various obsessions. Checking and counting compulsions were striking externally projected behaviors. We found that he had difficulty falling asleep and maintaining sleep. He had insight regarding his disorder. The Yale Brown Obsessions and Compulsions Scale (YBOCS) score was found to be 34 (obsession subtotal: 18, compulsion subtotal: 16).

The physical examination findings of the case were normal. The blood count, thyroid function tests, liver function tests, kidney function tests, electrolytes and B12 vitamin level were found to be within normal limits. There was no abnormality in EEG and CT results. Magnetic resonance imaging (MRI) revealed that the cerebellar tonsils were herniated 6-7 mm towards the inferior and the diagnosis was Chiari malformation type 1. Surgery was recommended but he refused. There was no history of a psychiatric or neurological disease diagnosis in first-degree relatives.

The patient was started on sertraline 50 mg/day and was planned to be followed-up with Cognitive Behavioral Therapy. When the symptoms increased, sertraline was increased to 100 mg/day and aripiprazole 5mg/day was added to the treatment. The patient is continuing outpatient follow-ups and a decrease was found in the YBOCS scale scores on the last follow-up. The treatment of the patient continues.

**Discussion**

Obsessive compulsive disorder can coexist with obsessions and compulsions. Obsessions are persistently repetitive ego-dystonic thoughts, impulses or visions that unintentionally come to mind, make the person uncomfortable, and cannot be eliminated with the will of the individual. Compulsions are behavioral or mental activities without any aim of pleasure, often aiming to reduce the anxiety caused by obsessions or performed to prevent the feared results [1].

The number of studies regarding the etiopathogenesis, diagnosis and treatment of obsessive compulsive disorder has increased [2]. The presence of obsessive compulsive disorder cases starting after head trauma in particular, brain imaging method results, and improvement with drugs that block the reuptake of serotonin and certain surgical methods such as cingulotomy and stereotactic surgery have increased the importance of biological factors in obsessive compulsive disorder etiology [3,10,11].

Although the patient was diagnosed with obsessive compulsive disorder with the history and examination, symptoms such as headache and balance loss that had started simultaneously were not ignored. Considering the studies explaining the importance of biological factors in obsessive compulsive disorder etiology, the disorder was thought to be related to the Chiari malformation in this patient.

Symptomatic Chiari malformations are diagnosed late due to their late findings independent of whether there is accompanying syringomyelia. An important part of the cases are misdiagnosed with multiple sclerosis, muscular dystrophy and other degenerative diseases [12]. MRI is reported to have become a preferred method in the diagnosis of cervicomedullary junction and posterior fossa pathology such as the Arnold-Chiari malformation due to its ability to provide sagittal sections and the lack of artifacts related to bone [13]. The congenital anomaly of Chiari Type 1 malformation similarly became symptomatic at the age of 22 in our case and the diagnosis was made not with CT imaging but with MR imaging following taking the patient's history and the examination. There are various opinions about an asymptomatic Chiari malformation becoming symptomatic in previous studies. One of them is the thought to be progressive development of arachnoidal adherence and thickening around the foramen magnum leading to the emergence of the symptoms [14]. However, arachnoidal adherence is

not shown in all cases and certain cases have remained asymptomatic despite sufficient foramen magnum decompression [15].

Our aim in this case report is not to base the OCD etiology on the Chiari malformation. However, the simultaneous emergence of neurological and psychiatric symptoms in the patient is striking. It may have created a stress effect due to the presence of neurologic symptoms in the patient such as headache and dizziness and these symptoms decreasing the functionality of the patient. Stress allows homeostasis to continue by increasing adrenocorticotropic hormone (ACTH) and cortisol. The investigation of the function of the Hypothalamic Pituitary Axis (HPA) is one of the areas of psycho-endocrinology. Changes in the HPA axis are known to be related to some psychiatric disorders [16]. There are studies showing similar hyperactivity of the HPA in OCD patients [17]. These data may suggest that the OCD symptoms that began in this patient may have initiated with stress.

Another point is the importance of neurological evaluation and imaging methods such as MRI in psychiatric cases, especially in their early stages. Comorbidity of Chiari malformation and OCD can be coincidental. However, this case is important in terms of drawing attention to the Chiari malformation and OCD comorbidity as well as the importance of a detailed neurologic evaluation when physical symptoms appear.

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