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Could Compulsive Orofacial Behaviors in OCD Lead to Dental Malocclusion? A Hypothesis on Neurostress Mechanisms and Clinical Overlap

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Abstract
Background: *Obsessive-Compulsive Disorder (OCD) is defined by intrusive thoughts and repetitive actions. Although the cognitive and emotional aspects of OCD have been extensively examined, the physical aspect—especially compulsive behaviors related to the orofacial region—has not received as much attention.*
Objective: *This narrative, based on hypotheses, investigates the possible connection between chronic orofacial compulsions in OCD and the progression of dental misalignment and temporomandibular joint disorders.*
Methods: *A theoretical framework is presented that combines insights from psychiatry, neurology, and dental sciences to analyze how behaviors like jaw clenching, biting of lips or cheeks, and attempts at achieving symmetry may induce structural alterations in dental health over time.*
Results: *The proposed model indicates that persistent low-level mechanical stress from habitual orofacial actions could contribute to enamel erosion, periodontal damage, changes in occlusion, and joint dysfunction. These outcomes might serve as a physical manifestation of the severity of compulsions and muscle hyperactivity driven by anxiety.*
Conclusion: *Identifying orofacial compulsions as a somatic expression of OCD could create new avenues for interdisciplinary prevention and treatment approaches. Additional empirical studies are necessary to confirm this association and inform cooperative management strategies between psychiatric care and dentistry.*

Keywords: *OCD, Neurostress, Clinical Overlap*

1. Introduction

Obsessive-Compulsive Disorder (OCD) is a persistent and diverse psychiatric condition marked by intrusive thoughts, known as obsessions, and repetitive actions referred to as compulsions. These compulsions are often time-intensive and are typically carried out in response to anxiety or perceived threats [1]. It is estimated that OCD affects around 2–3% of individuals worldwide, commonly emerging during adolescence or early adulthood [2].

While traditional compulsive behaviors include checking, washing, and organizing, some patients display less recognized actions that directly involve the body, identified as repetitive somatic or sensorimotor compulsions [3]. Among these actions, orofacial

compulsions—such as habitual jaw clenching, teeth grinding (bruxism), biting of the cheeks or tongue, and consistent pressure on specific dental areas—have been reported anecdotally in clinical settings. Nevertheless, these behaviors are still underrepresented in scientific literature, especially concerning their potential long-term effects on dental structures [4].

In contrast to temporomandibular joint disorders (TMD), which are associated with broader stress and anxiety issues, the orofacial compulsions observed in OCD stem from internal urges or obsessive doubts. These are often accompanied by a compelling need to achieve a sense of correctness or bodily symmetry. Such compulsive actions can manifest both consciously and unconsciously, particularly during heightened stress or mental strain.

This paper puts forth a new hypothesis: that recurring orofacial compulsive behaviors in OCD—specifically chronic jaw clenching, bruxism, and ongoing oral tension—may lead to progressive dental malocclusion, enamel erosion, and other structural or functional alterations within the orofacial system over time. Despite the plausibility of this association, there has yet to be any systematic investigation or formal review addressing this potential connection, highlighting a significant gap at the interface of psychiatry and dentistry.

2. Neurobiological Background

The underlying pathophysiology of Obsessive-Compulsive Disorder (OCD) is closely linked to abnormalities in the cortico-striato-thalamo-cortical (CSTC) circuit, which is essential for regulating behavior, making decisions, and monitoring errors. In individuals with OCD, there is often heightened activity observed in critical components of this circuit, such as the orbitofrontal cortex (OFC), anterior cingulate cortex (ACC), and caudate nucleus. This overactivity results in excessive signaling related to perceived threats or mistakes, subsequently prompting compulsive actions as a means of correction [5].

Neuroimaging research has consistently demonstrated increased metabolic activity in the OFC among those suffering from OCD, which correlates with the severity of symptoms and an inability to suppress repetitive actions [6].

This heightened activity may fuel internal urges to engage in rituals or physical behaviors, sometimes presenting as repetitive oral-motor activities or tension within the jaw and facial muscles. Chronic psychological stress significantly contributes to worsening OCD symptoms. Stress triggers the activation of the hypothalamic-pituitary-adrenal (HPA) axis, leading to increased levels of cortisol. Prolonged exposure to cortisol can result in muscle tension, particularly in areas like the neck, shoulders, and orofacial region [7].

This continuous muscle activation predisposes individuals to habits such as jaw clenching, teeth grinding, and bruxism—actions that often occur unconsciously and are associated with elevated arousal levels. In patients with OCD, the interplay between cognitive inflexibility, intensified threat perception, and autonomic responses to stress can promote the emergence of repetitive somatic behaviors, including compulsive muscle contractions

in the jaw. Over time, these ongoing orofacial muscular activities may result in maladaptive structural alterations such as malocclusion and temporomandibular dysfunction—even when there is no obvious dental issue present.

These observations provide a neurobiological basis for viewing chronic stress-related oral behaviors not simply as anxiety-related side effects but potentially as integral components within the compulsive behavioral profile characteristic of OCD itself.

3. Compulsive Orofacial Behaviors in OCD

The diagnostic criteria for Obsessive-Compulsive Disorder (OCD) primarily emphasize intrusive thoughts and visible compulsions, such as checking and washing. However, a specific group of patients exhibits compulsive behaviors focused on the orofacial area. These behaviors include chronic biting of the lips or cheeks, jaw clenching, awake bruxism (teeth grinding), persistent tongue pressure-seeking, and obsessive symmetry-checking concerning dental alignment. Patients frequently describe intense urges to "balance" their bite or to repetitively run their tongues over their teeth in search of perceived "imperfections." The relief felt after performing these compulsions reflects the reinforcement cycle typical in OCD. Such behaviors are not mere habits; they stem from internal obsessive triggers like discomfort with asymmetry, anxiety about potential dental damage, or sensory sensitivity.

Additionally, some individuals may partake in mirror-checking for occlusion discrepancies, apply pressure to specific teeth themselves, or avoid chewing food on one side due to a belief in misalignment. These actions extend beyond common stress reactions and are better categorized as somatic-focused compulsions that resemble other body-focused repetitive behaviors (BFRBs). In this light, compulsive orofacial activities may exhibit phenomenological similarities to trichotillomania (hair pulling) and dermatillomania (skin picking), both classified under Obsessive-Compulsive and Related Disorders in the DSM-5-TR [8].

All three conditions involve repetitive motor actions initiated by tension or an obsessive focus, culminating in temporary relief or satisfaction [9]. However, unlike trichotillomania and skin picking, compulsive oral behaviors often lead to less apparent consequences. This can result in underreporting and misidentification as simple habits or anxiety symptoms. Consequently, clinicians and dentists might overlook these actions despite their significant effects on tooth wear, changes in occlusion, gingival trauma, and temporomandibular dysfunction [10].

Considering their association with fundamental features of OCD—such as intrusive drives, repetitive execution of actions, and distress when interrupted—these orofacial behaviors warrant acknowledgment as integral components of the OCD spectrum rather than merely being viewed as comorbid habits.

4. Proposed Connection to Dental Malocclusion

Chronic and repetitive compulsive orofacial behaviors may serve as ongoing sources of low-level mechanical stress on dental and periodontal tissues. Over time, these behaviors—despite their subtle nature—can lead to cumulative physical alterations that ultimately contribute to malocclusion and temporomandibular dysfunction. The act of clenching or grinding teeth (bruxism), whether performed consciously or unconsciously during moments of anxiety or intense focus, applies excessive occlusal forces. Such forces can lead to enamel erosion, attrition of incisal edges, and even microfractures in vulnerable individuals [11].

In addition, repetitive actions like biting lips or cheeks, or pressing the tongue against particular teeth, exert eccentric forces that may modify tooth alignment, resulting in dental shifting and asymmetry. This effect is particularly pronounced when these behaviors persist for months or years without clinical recognition or orthodontic intervention [12].

Another significant outcome of these stressors is gingival recession, which occurs due to repeated trauma to soft tissues—either through mechanical abrasion or heightened periodontal tension during clenching. Research indicates that even subclinical bruxism is associated with increased gingival inflammation and attachment loss, especially in patients experiencing concurrent psychological stress [13].

More importantly, temporomandibular joint (TMJ) dysfunction can arise from prolonged overuse of the masseter and temporalis muscles, leading to joint inflammation, disc displacement, and restricted jaw movement. Individuals with OCD who engage in persistent jaw-related behaviors may be at a higher risk due to both muscle hypertonicity and repetitive loading driven by compulsion [14].

Thus, the proposed mechanism is one of chronic subclinical mechanical stress induced by compulsive behaviors → progressively resulting in:

- Enamel wear
- Tooth mobility
- Malocclusion
- Soft tissue recession
- Temporomandibular disorders

This hypothesis connects a behavioral-neuropsychiatric origin with observable dentofacial consequences, providing a new framework for investigating orofacial health as an external indicator of compulsive severity in OCD.This proposed model is illustrated conceptually in Figure 1, outlining the hypothesized pathway from OCD-related compulsive orofacial behaviors to progressive dental damage and the recommended interdisciplinary management approach.

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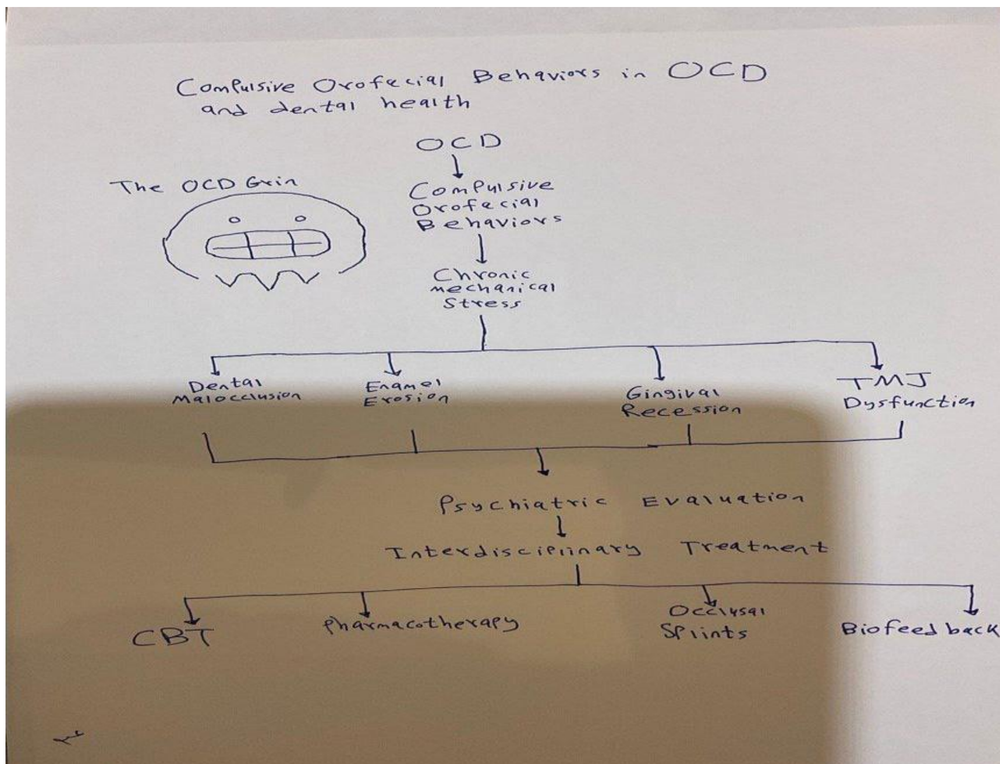

Figure 1 Hypothetical pathway linking compulsive orofacial behaviors in OCD to long-term . dental complications. Compulsive behaviors such as clenching or grinding may cause chronic mechanical stress, leading to enamel erosion, malocclusion, gingival recession, and TMJ ,dysfunction. Psychiatric evaluation followed by interdisciplinary treatment—including CBT pharmacotherapy, occlusal splints, and biofeedback—may help prevent irreversibleoutcomes..

5. Clinical Implications

Understanding the relationship between compulsive behaviors involving the orofacial region and their long-term effects on dental health is crucial for both psychiatric and dental professionals.

For psychiatrists, being aware of these behaviors can improve diagnostic precision and highlight a physical aspect of compulsions that might otherwise be missed. Patients often do not disclose orofacial habits unless explicitly prompted; however, such actions may indicate deeper issues related to anxiety, sensory fixation, or cognitive inflexibility.

Dentists should assess patients who exhibit unusual wear patterns, soft tissue injuries, or unexplained malocclusion—especially when there is no clear orthodontic or traumatic background—for potential psychological or compulsive origins. Referring these individuals for psychiatric evaluation can facilitate early intervention, preventing irreversible harm.

Furthermore, recognizing this connection paves the way for comprehensive treatment approaches. These may encompass:

- **Cognitive Behavioral Therapy (CBT)** aimed at addressing obsessive thoughts and compulsive oral behaviors.

- **Pharmacotherapy** (e.g., SSRIs) to diminish the compulsion drive.
- **Occlusal splints or night guards** to protect against mechanical damage while behavioral therapy is underway.
- **Biofeedback techniques** designed to alleviate subconscious clenching.

Ultimately, this underscores the importance of collaborative care between psychiatry and dentistry. Just as dermatologists work alongside psychiatrists in cases like trichotillomania or excoriation disorder, a similar psycho-dental approach may be vital for patients whose obsessive-compulsive disorder manifests through oral behaviors.

Such collaboration could not only lower dental complications but also provide a measurable indicator of treatment effectiveness; improvements in oral habits may signify enhanced overall symptom management.

6. Future Directions

The limited focus on the orofacial effects of obsessive-compulsive behaviors highlights a significant gap that necessitates empirical research to investigate the potential link between OCD and progressive dental changes.

Initial actions should encompass:

Cross-sectional studies that analyze the prevalence of dental malocclusion, enamel degradation, and temporomandibular dysfunction among individuals with OCD compared to appropriately matched control groups.

Case series that provide comprehensive clinical profiles of OCD patients exhibiting compulsive oral habits and their corresponding dental consequences.

To support this research, it is essential to create or modify integrated assessment tools that connect psychiatric evaluations with dental considerations. These tools may involve:

Structured oral health assessments conducted within psychiatric environments for patients diagnosed with OCD.

Validated questionnaires aimed at capturing orofacial compulsive behaviors (e.g., frequency of jaw clenching, lip biting, and obsessions regarding dental symmetry).

Additionally, **longitudinal studies** could elucidate whether enhancements in psychiatric symptoms—through pharmacological treatments or behavioral therapies—result in diminished oral harm or better occlusal outcomes.

In the long run, such findings could aid in formulating interdisciplinary management protocols, promoting early detection, preventing complications, and enhancing the quality of life for individuals suffering from this frequently overlooked manifestation of OCD.

7. Conclusion

This hypothesis suggests that compulsive orofacial actions associated with obsessive-compulsive disorder (OCD)—including persistent jaw clenching, cheek biting, and teeth

grinding—might be overlooked factors contributing to the gradual development of dental malocclusion and orofacial dysfunction.

Although these behaviors are physical in nature, they frequently escape detection during routine psychiatric assessments and are often undervalued by dental practitioners who may not consider psychological influences on structural changes in the mouth.

It is crucial to enhance clinical awareness regarding this possible connection. Timely identification could facilitate more effective interdisciplinary strategies that safeguard oral health, diminish functional limitations, and adopt a more comprehensive method for managing OCD.

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