"The Impact of Partial Medical History on Orthodontic Care: An Unrecognized Mouthing Habit": A case Report

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Abstract

Background: Undisclosed mouthing habits, including geophagia—a subtype of pica involving ingestion of soil or clay—can complicate orthodontic treatment. Such behaviors are often unrecognized, and their impact on appliance integrity is seldom reported.

Case Presentation: A 17-year-old female with bimaxillary dentoalveolar protrusion underwent fixed orthodontic therapy. During treatment, recurrent bracket dislodgement and distortion of the transpalatal arch were observed, accompanied by unusual oral debris and minor mucosal trauma. Behavioral assessment revealed a previously concealed habit of clay chewing. Laboratory evaluation confirmed iron deficiency anemia, and abdominal radiography demonstrated retained soil deposits. Active orthodontic treatment was discontinued to prevent further appliance damage and ensure patient safety.

Conclusion: Concealed mouthing habits, such as geophagia, may lead to unexplained orthodontic appliance failure and treatment interruption. Thorough history-taking, careful clinical observation, and a multidisciplinary management approach are essential for early detection, safe treatment, and holistic patient care.

Keywords: Mouthing habit, Geophagia, Orthodontics, Appliance failure, Pica, Adolescent health.

Introduction

Mouthing behaviors, including geophagia—a subtype of pica characterized by the deliberate ingestion of soil, clay, or other non-nutritive substances—are recognized for their systemic and oral health consequences.[1–3] Such behaviors are more frequently reported in children, pregnant women, and individuals with psychiatric disorders or mineral deficiencies, particularly iron deficiency anemia. Although sometimes considered culturally normative in specific regions, they are increasingly regarded as behavioral disorders with significant medical and dental implications.[2,4]

Ingestion of earth-based materials may expose individuals to microbial pathogens and chemical contaminants, leading to complications such as parasitic infections, gastrointestinal obstruction, nutritional imbalances, and in severe cases, perforations of the gastrointestinal tract.[1,5] Chronic practice has also been linked to anemia, malabsorption, and hepatic

dysfunction.[3,6] Despite this, the dental literature provides limited documentation on the effects of such habits in orthodontic contexts.

For orthodontists, unexplained appliance breakage, recurrent soft tissue trauma, and unusual oral deposits may be early signs of concealed mouthing behaviors. However, these habits are often unreported due to embarrassment or lack of awareness, leading to delayed diagnosis and treatment disruption.[7,8]

This case report describes an adolescent patient whose orthodontic treatment was interrupted by an undisclosed mouthing habit. It emphasizes the importance of meticulous history-taking, sensitive behavioral inquiry, and multidisciplinary collaboration when encountering recurrent mechanical complications during orthodontic therapy. [6,9]

Case Report

A 17-year-old female presented to the Department of Orthodontics, Mansarovar Dental College and Research Centre, Bhopal, with the chief complaint of forwardly placed upper anterior teeth and excessive gingival display. Extraoral examination showed a mildly convex profile with competent lips at rest. Intraoral findings revealed an Angle's Class I molar relationship, marked proclination of the maxillary incisors, and a pronounced gummy smile. Oral hygiene was satisfactory overall; however, firm brownish deposits were observed on the posterior teeth, initially interpreted as extrinsic stains or plaque accumulation.

Diagnostic records, including cephalometric and model analysis, confirmed **bimaxillary dentoalveolar protrusion with vertical maxillary excess**. Treatment planning involved maxillary setback surgery, preceded by pre-surgical orthodontic decompensation using fixed appliance mechanotherapy with 0.022-inch MBT brackets.

During the initial follow-up, several premolar brackets were dislodged, and the transpalatal arch (TPA) appeared partially distorted and chewed. Brownish deposits again reappeared on the posterior teeth. Despite repair and reinforcement, subsequent visits showed recurrent appliance damage, enamel chipping, and minor mucosal lacerations.

The repeated mechanical failures and atypical clinical pattern prompted further investigation. On non-judgmental counseling, the patient admitted to a long-standing **mouthing habit of chewing clay**, which had not been disclosed earlier due to embarrassment. Medical history

revealed a diagnosis of anemia under treatment with oral iron supplements. Laboratory evaluation confirmed reduced serum ferritin levels (15 mcg/L). Abdominal radiography demonstrated radiopaque shadows consistent with soil or silica ingestion.

Considering the persistent risk of appliance damage, aspiration, and ingestion of orthodontic components, active treatment was discontinued after the pre-surgical phase. A passive removable retainer was provided to maintain the achieved alignment, and the patient was referred for **psychological counseling and nutritional management** to address the underlying habit and associated systemic condition.

Discussion

Mouthing habits, including geophagia—a recognized subtype of pica—are associated with diverse systemic and oral health complications.[7] Although traditionally linked with certain geographic, ethnic, or socioeconomic groups, their occurrence in individuals outside these risk profiles, such as the present case involving an educated adolescent, highlights the need for broader clinical awareness.[8,9]

In this patient, repeated appliance dislodgement, brownish posterior deposits, and mucosal lacerations initially suggested technical or mechanical shortcomings. However, the consistent recurrence of appliance breakage and the unusual debris warranted behavioral investigation. Subsequent disclosure of a long-standing clay-chewing habit, supported by hematologic and radiographic evidence, confirmed the underlying cause. Previous reports have described comparable patterns of appliance damage, enamel wear, and soft tissue injury in patients with pica-related behaviors.[4,7,9]

Iron deficiency anemia is both a predisposing factor and a sequela of such habits. Compulsive ingestion of non-nutritive substances interferes with nutrient absorption, perpetuating a cycle of deficiency and abnormal eating behaviors.[3,5,8,11] The reduced ferritin level observed in this case reinforced the association. From an orthodontic standpoint, unexplained recurrent appliance failure should raise suspicion of concealed behavioral habits such as mouthing or pica.[12]

Effective management requires a multidisciplinary strategy, incorporating psychological counseling, nutritional rehabilitation, and medical intervention.[1,6,10,12] In the present case,

abdominal radiography played a crucial role in demonstrating retained soil particles, supporting both diagnosis and clinical decision-making. Early identification of such behaviors and timely referral to appropriate specialists are essential for preventing treatment complications and ensuring holistic patient care.

Conclusion

This case emphasizes the significance of considering atypical behavioral factors when confronted with recurrent orthodontic appliance failures. Undiagnosed mouthing habits, if unrecognized, may compromise appliance integrity, delay treatment progress, and increase clinical risks. Thorough history-taking, careful observation of unusual clinical signs, and sensitive behavioral inquiry are essential for early recognition. Successful management depends on a collaborative, multidisciplinary approach involving dental, medical, and psychological care providers. Identifying and addressing the root cause not only safeguards orthodontic outcomes but also contributes to the patient's overall systemic and psychological well-being.

References

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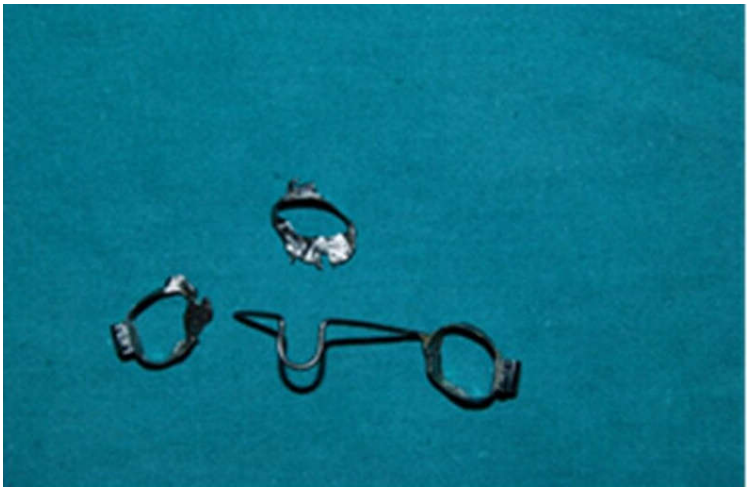
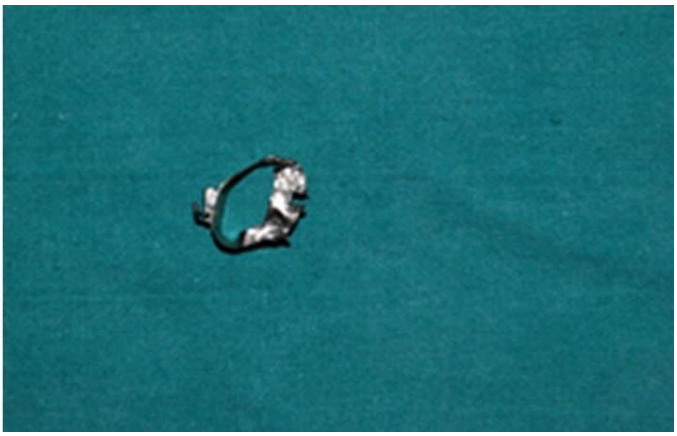
Legend of photographs

1. Broken transpalatel arch



2. Chewed molar band



3. Abdominal x-ray showing soil, clay particles