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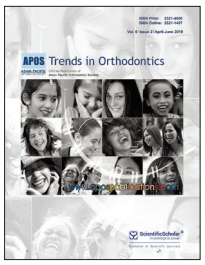

Case Report

Extensive enamel and dentin destruction associated with the misuse of invisible retainers

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ABSTRACT

Invisible or clear retainers have gained significant popularity as a post-orthodontic treatment option due to their clear, removable design and effectiveness in maintaining teeth alignment discreetly and comfortably. However, as with any dental intervention, adverse events may occur, particularly if the device is misused or if there is poor patient compliance. We present a case of extensive enamel and dentin destruction associated with the misuse of invisible retainers in a 14-year-old female patient who used the retainer for 30 months permanently, even eating with it. The extensive destruction needed several appointments until a complete reconstruction was obtained. Our clinical case underscores the importance of diligent post-treatment follow-up to guarantee the correct use of clear retainers. Communication and close follow-up are essential to guarantee the correct use of invisible retainers.

Keywords: Adverse events, Clear retainer, Invisible retainer, Orthodontic retention

INTRODUCTION

Invisible retainers have gained significant popularity as a post-orthodontic treatment option due to their clear, removable design and effectiveness in maintaining teeth alignment discreetly and comfortably. However, as with any dental intervention, adverse events may occur, particularly if the device is misused or if there is poor patient compliance.

CASE REPORT

A 14-year-old female patient without significant medical history received a successful 24-month course of orthodontic treatment with clear Invisalign® aligners to correct malocclusion and achieve dental alignment. The initial diagnosis had been Class II mandibular malocclusion and a dental Class II with a right functional deviation of the lower midline. Her teeth showed signs of generalized hypomineralization. The therapeutic plan included two phases, both with Invisalign®: (1) preparation of pre-advance of dental arches and (2) mandibular advance and occlusal adjustment of dental arches [Figure 1]. An invisible retainer was prescribed to maintain the achieved results, but despite clear recommendations and several phone calls insisting on the need for follow-up, she only returned to the dental clinic after 30 months. During that period, she continuously used the clear retainer, even eating with it, and never brushed her teeth. She started presenting discomfort, pain, and tooth sensibility and finally came again to the dental clinic.

Upon examination, the patient appeared uncomfortable and cried at length. Retainers were difficult to remove, and once removed, we could see dental erosion with generalized enamel destruction.

Figure 1: Anterior intraoral views: baseline (up) and after successful 24-month course orthodontic treatment (down).

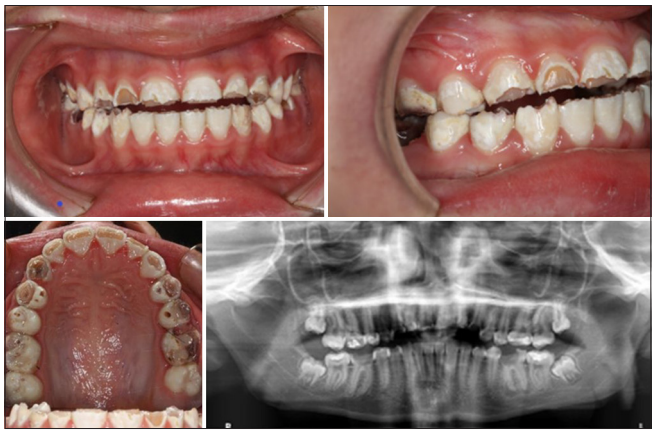

Figure 2: Intraoral views and panoramic radiography depicting extensive enamel destruction.

Intraoral examination revealed extensive enamel and dentin destruction by decay [Figure 2]. Other causes that could explain enamel erosion (changes in dietary habits, increase in the consumption of sugary foods and drinks, saliva production impairment, gastroesophageal reflux disease, drug use, anorexia, and bulimia) were not present. The clear retainer itself appeared dirty but intact without visible signs of damage. The patient was advised to discontinue wearing the invisible retainer.

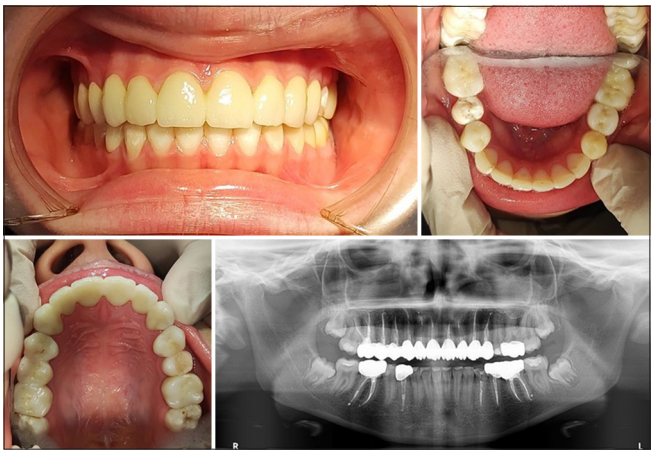

Figure 3: Intraoral views and panoramic radiography after complete reconstruction with restorative dentistry.

The patient and her guardian were educated on proper oral hygiene, emphasizing the importance of frequent tooth brushing. The initial phase of treatment focused on the prevention of further disease and included cessation of retainer-wearing, dietary and oral hygiene advice, and daily use of a fluoride mouth rinse. Several appointments were scheduled until a complete reconstruction was obtained using restorative dentistry solutions [Figure 3]. After complete restoration, to guarantee the stability of the result, we used an upper discharge splint and a lower 3 × 3 fixed retainer.

DISCUSSION

The range of the treated cases with clear aligners has expanded from the treatment of simple orthodontic cases to more complex cases, such as treatment of anterior open bite, bimaxillary protrusion, excessive facial height, and severe dental crowding.[1-3] Invisible retainers have gained significant popularity as a post-orthodontic treatment option due to their clear, removable design and effectiveness in maintaining teeth alignment discreetly and comfortably. These clear thermoplastic retainers are custom-made to fit individual patients' dental arches, providing a convenient alternative to traditional wire retainers. However, as with any dental intervention, adverse events may occur, particularly if the device is misused or if there is poor patient compliance. Previous concerns have been raised regarding potential adverse events associated with invisible retainers' use, and the need for more clinical studies of biocompatibility has been suggested.[4] Reports of adverse events associated with clear retainers encompass a spectrum of issues ranging from minor discomfort to more serious complications. Commonly reported adverse events include soft tissue irritation, gingival recession, tooth movement, allergic reactions, and cracking or breakage. A preceding report described severe caries and demineralization in a patient wearing an Essix-type retainer

due to the consumption of large quantities of cariogenic drinks while wearing the retainer.[5] However, in that case, the patient removed the appliance for cleaning. Ours is the first case report of continuous use of an invisible retainer with concomitant severe enamel destruction.

Retention is an important part of orthodontic therapy and is advisable for almost all treated malocclusions. Invisible retainers are becoming increasingly popular for the holding of teeth following orthodontic treatment. Our clinical case underscores the importance of diligent post-treatment follow-up,[6] particularly in the case of removable orthodontic retainers that could be associated with more periodontal damage than fixed retainers.[7] The orthodontist is responsible for keeping the patient informed on the properties, the duration of retention, and the need for close follow-up.[8] While many adverse events are relatively minor and can be managed conservatively, others may require more proactive intervention. Future improvements, including the use of aligners and retainers with antibacterial action[9] might decrease the risk of complications.

CONCLUSION

Clinicians should be vigilant in monitoring patients for signs of discomfort or complications and be prepared to address any issues that may arise. Communication and close follow-up are essential to guarantee the correct use of invisible retainers. Orthodontists and general dental practitioners should be vigilant and ensure that patients are educated regarding the risks of gingivitis, caries, and demineralization throughout the retention phase with clear retainers.

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