

Prevention of Malocclusion with Early Use of a Removable Maxillary Expander Following Premature Deciduous Tooth Extraction: A Clinical Case Report

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Abstract

Deciduous teeth are often extracted without maintaining their spaces, based on the assumption that they will eventually be replaced. This issue may arise from a lack of community awareness about the importance of space maintainers and economic factors, as these services are often not provided in the public health sector. This study reports a clinical case of a 12-year-old female who presented to my private dental clinic with her mother requesting a dental filling. During the examination, narrow maxilla and loss of space from a previously extracted deciduous tooth were noted. The condition was treated early using a removable maxillary expander, which helped avoid the need for future orthodontic and surgical interventions.

Keywords: Interceptive; Orthodontics; Expander; RME; Case Report

Introduction

Each deciduous tooth has a specific timeframe for exfoliation. When a tooth is extracted prematurely, a common complication is the mesial drift of adjacent teeth toward the extraction site, which may result in the impaction of the permanent successors.

To prevent these consequences, the space should be maintained after extraction using a space maintainer. If space loss occurs, it can be restored with a functional appliance, customized in type and design based on the patient's dental development, the involved jaw, and the child's level of cooperation.

The Rapid Maxillary Expander (RME) is an orthodontic functional appliance used to widen the upper jaw in cases of crossbites, dental crowding, and to create space for unerupted teeth. This removable device consists of a metal framework attached to the upper teeth and includes a central screw, which is activated every other day to facilitate maxillary expansion.

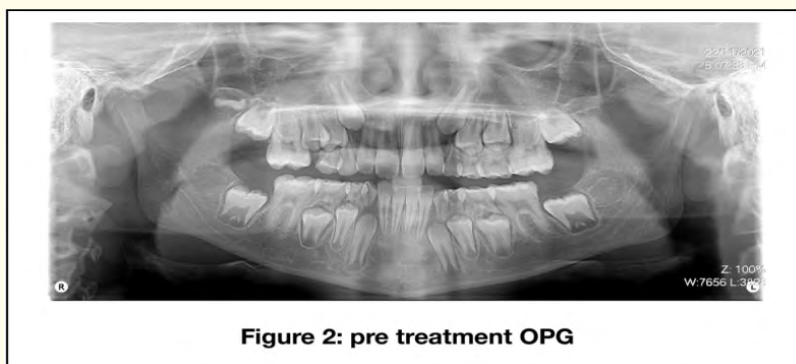
Case Report

H.A., an Omani female, attended my clinic with her mother in November 2021 at the age of 10, complaining of food getting stuck in tooth 54. During the dental examination, it was noted that tooth 55 was missing and that its space was nearly lost (Figure 1). Tooth 54 was

restored with glass ionomer cement (GIC) after caries excavation, and an orthopantomogram (OPG) was taken to assess the unerupted tooth 15.



OPG showed inadequate space for tooth 15, permanent canines were mesially angulated due to the narrowing of the upper jaw (Figure 2). The treatment plan was to place removable maxillary expander followed by orthodontic treatment if needed.



Treatment

Patient came back again in April 2022 and appliance was placed (Figure 3). She was asked to expand the jaw using the lock once every other day and come for monthly reviews.

In August 2022, patient came to the clinic with her mother complaining of appliance breakage, under the supervision of Dr. M.Z, another alginate impression was taken to construct a new expander. 2 weeks later, patient came saying that she removed the appliance only for dinner and since then she was unable to place it back again.



Figure 3: intra-oral photograph of RME at the beginning of the treatment

We had to reverse the motion 7 times back till it was fitting again into the palate. Patient and her mother were informed not to remove it for long time other than mealtime. Patient kept showing up once monthly for review and it was demonstrating a good progress (Figure 4).



Figure 4: occlusal view of RME after 4 months of activation

In November 2022, tooth 54 became discolored and mobile (Figure 5), it was bothering the patient so she stopped wearing the appliance for few days. The tooth was extracted and the appliance was returned back 14 turns to fit into the palate again. The next month, patient showed excellent compliance, clearly there was no more jaw constriction present so she became in stabilization phase.



Figure 5: lateral view photograph of tooth 54

New OPG and Lateral Cephalometric were taken in March 2023 (Figure 6). It showed that both teeth 15 and 14 were erupting and upper canines were in better angulation. Patient was asked to wear the appliance at night only until upper canines erupt. The patient was monitored monthly till December 2023 when we decided to repeat OPG and LC (Figure 7), the results were excellent. Remarkable improvement in the eruption angulation of upper canines. All what we had to do is to wait for upper deciduous canines to exfoliate otherwise they will be extracted, and that what happened in the next month naturally.

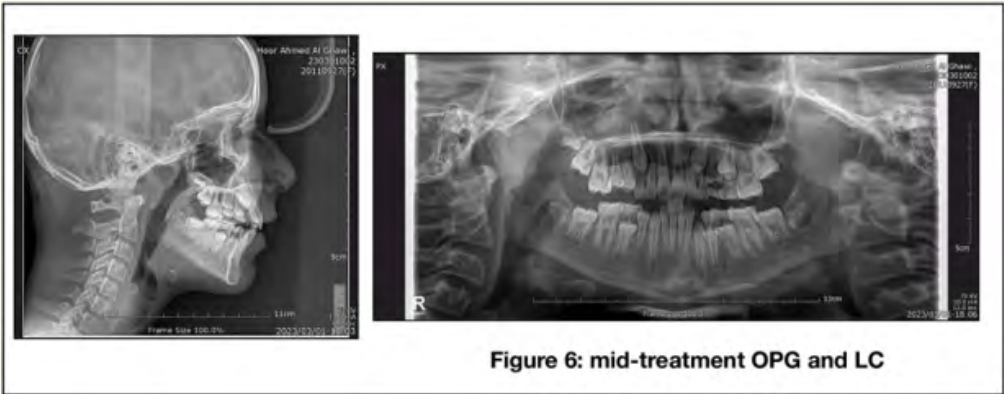


Figure 6: mid-treatment OPG and LC

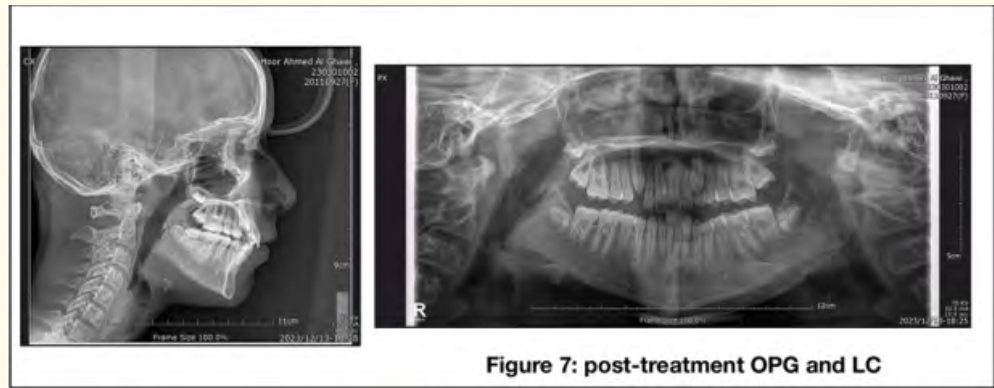


Figure 7: post-treatment OPG and LC

In May 2024, upper canines were erupting (Figure 8), so there was no need to use the appliance anymore. Mother was informed that the treatment phase is over, she can come for cosmetic orthodontic treatment only if needed.



Discussion

The primary outcome of this case was the successful expansion of the maxilla, which allowed the eruption of tooth 15 and repositioning of the upper canines. As observed through serial radiographs and clinical follow-up, the maxillary arch showed significant improvement in terms of space, with the canines angulating properly in relation to the upper arch. The secondary outcomes included the stabilization of the jaw’s width, resulting in improved arch development and avoiding the need for orthodontic surgical intervention [3].

One of the key strengths of this case was the early recognition and timely intervention, which allowed for a conservative treatment approach. By using a removable maxillary expander, we were able to avoid more invasive treatments and ensure a favorable outcome [2,4].

However, several limitations should be considered. This case report is based on a single patient, which limits the applicability of the findings to a broader population. The patient’s compliance with the appliance and regular follow-ups played a key role in the success of the treatment, which may not be as consistent in other cases.

Conclusion

This case demonstrates that dental space loss can be addressed through non-surgical methods, as long as the patient is cooperative and seeks treatment promptly. General dentists should carefully monitor for such issues during routine exams to enable early intervention, preferably in collaboration with an orthodontist or through a direct referral. This underscores the need for parental awareness, as successful outcomes in cases like these often require multiple visits and patience [5-15].

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