



## Ectopic eruption of the first permanent molar and space regaining: Case report.

Carla Cifuentes Harris<sup>1</sup> , Gustavo González Gratz<sup>2</sup> .

**Abstract: Introduction:** Ectopic eruption of the first permanent molar is a common anomaly that can lead to premature loss of the second primary molar and malocclusion. Therefore, early diagnosis and treatment are crucial to prevent complications. **Case report:** A 7-year-10-month-old male patient with ectopic eruption of the maxillary left first permanent molar was diagnosed after the premature loss of the second primary molar. A removable space bridge with a distalizing screw was implanted weekly for 6 months. Radiographically, complete distalization of the first permanent molar and space restoration were achieved. Clinically, the tooth position was corrected, preserving space for the eruption of the second premolar, and adequate long-term occlusion was established. **Conclusions:** The removable space bridge with a distalizing screw is an effective, low-cost, and easy-to-implement technique for the early treatment of ectopic eruption of the first permanent molar. but it requires commitment and collaboration from the patient and their guardians.

**Key words:** First permanent molar, Ectopic eruption, Interceptive orthodontics, Pediatric dentistry, Orthodontics.

## Erupción ectópica del primer molar permanente y recuperación de espacio: Reporte de caso.

**Resumen: Introducción:** La erupción ectópica del primer molar permanente es una anomalía común que puede llevar a la pérdida prematura del segundo molar temporal y problemas de maloclusión. Por lo tanto, el diagnóstico y tratamiento tempranos son cruciales para prevenir complicaciones. **Reporte del caso:** paciente masculino de 7 años y 10 meses con erupción ectópica del primer molar permanente superior izquierdo, diagnosticado tras la pérdida prematura del segundo molar temporal. Se implementa un recuperador de espacio removible con tornillo distalizador activado semanalmente durante 6 meses. Radiográficamente, se logró la distalización completa del primer molar permanente y la recuperación del espacio. Clínicamente, se corrigió la posición del diente, preservando el espacio para la erupción del segundo premolar y se estableció una oclusión adecuada a largo plazo. **Conclusiones:** El recuperador de espacio removible con tornillo distalizador es una técnica eficaz, de bajo costo y fácil implementación para el tratamiento temprano de la erupción ectópica del primer molar permanente; pero que requiere compromiso y colaboración del paciente y sus tutores.

**Palabras clave:** Primer molar permanente, Erupción ectópica, Ortodoncia interceptiva, Odontopediatría, Ortodoncia.

<sup>1</sup>Cátedra de Ortodoncia, Universidad de Valparaíso, Chile.

<sup>2</sup>Cátedra de Odontopediatría, Universidad de Valparaíso, Chile.

## Erupção ectópica do primeiro molar permanente e recuperação de espaço: Relato de caso.

**Resumo:** **Introdução:** A erupção ectópica do primeiro molar permanente é uma anomalia comum que pode levar à perda prematura do segundo molar decíduo e à má oclusão. Portanto, o diagnóstico e o tratamento precoces são cruciais para prevenir complicações. **Relato de caso:** Paciente do sexo masculino, de 7 anos e 10 meses de idade, com erupção ectópica do primeiro molar permanente superior esquerdo, foi diagnosticado após a perda prematura do segundo molar decíduo. Uma ponte espacial removível com parafuso distalizador foi implantada semanalmente durante 6 meses. Radiograficamente, a distalização completa do primeiro molar permanente e a restauração do espaço foram alcançadas. Clinicamente, a posição do dente foi corrigida, preservando o espaço para a erupção do segundo pré-molar, e uma oclusão adequada a longo prazo foi estabelecida. **Conclusões:** A ponte espacial removível com parafuso distalizador é uma técnica eficaz, de baixo custo e de fácil implementação para o tratamento precoce da erupção ectópica do primeiro molar permanente, mas requer comprometimento e colaboração do paciente e de seus responsáveis.

**Palavras-chave:** Primeiro molar permanente, Erupção ectópica, Ortodontia interceptiva, Odontologia pediátrica, Ortodontia.

### Introduction

The ectopic eruption of the first permanent molar (FPM) is an eruptive anomaly that affects the normal path of the tooth, causing a pronounced mesial angulation. This phenomenon frequently leads to the resorption of the distal root of the second temporary molar and, in many cases, to the premature loss of the latter<sup>1,2</sup>. According to various studies, the prevalence of this condition varies between 16% and 43%, being more common in the maxilla and primarily affecting patients between 6 and 9 years of age<sup>3,4</sup>.

Early diagnosis is essential to prevent major complications. If not addressed in a timely manner, ectopic eruption can lead to loss of space, severe malocclusions, and dental crowding. Furthermore, untreated malocclusions in early stages may require longer and more expensive orthodontic treatments in adolescence and adulthood, which underscores the importance of interceptive orthodontics<sup>5</sup>.

The process of dental eruption is regulated by a series of biological and mechanical factors that act in conjunction. From a biological perspective, recent studies have identified an important role for mast cells in pericoronal tissues. These inflammatory cells release chemical mediators such as histamine and proteases, which facilitate the bone remodeling necessary for dental eruption<sup>6</sup>. Disruption of this process can influence the development of ectopic eruptions, highlighting the need for early interventions and strategies that promote proper eruption<sup>6</sup>.

Among the causes of this alteration are local factors, such as a reduced size of the maxillary arch, supernumerary teeth, or the abnormal position of neighboring teeth. Systemic factors have also been identified, such as genetic alterations that predispose to inadequate eruptive paths<sup>7</sup>. In this regard, recent studies have highlighted that interceptive orthodontic appliances, both fixed and removable, are effective in correcting these alterations and restoring the functionality of the affected dental arch<sup>8</sup>.

The use of space regainers and distalizing devices has been widely supported by the literature as an effective and accessible method for managing the ectopic eruption of the FPM. Techniques such as the removable distalizing screw are not only effective but also have the advantage of being less invasive and more accessible compared to advanced fixed devices<sup>9,10</sup>. This clinical case illustrates the implementation of a removable distalizing screw to correct the ectopic eruption of the FPM, highlighting its efficacy, accessibility, and applicability in contexts with limited resources.

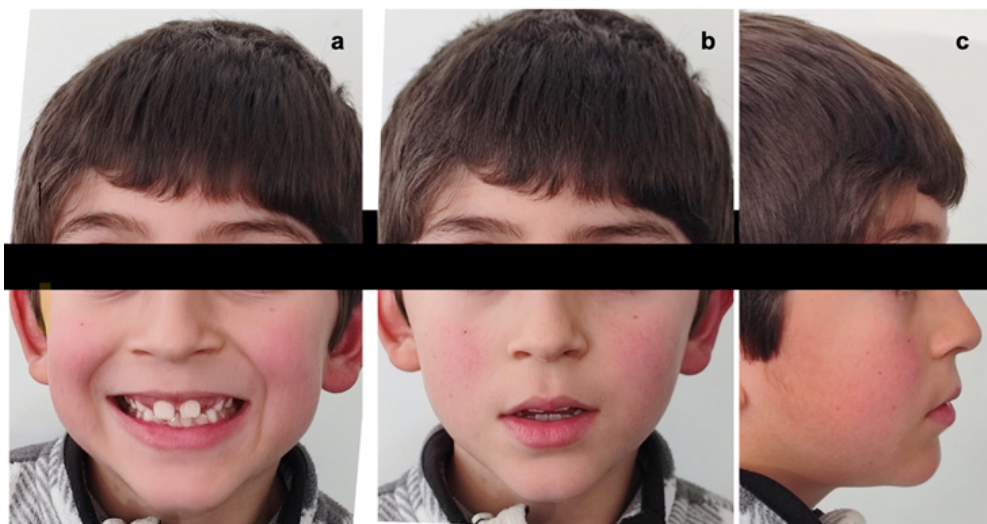
### Case Report

A male patient, 7 years and 10 months of age, presented for consultation due to the premature loss of the primary molar #J (65) caused by the ectopic eruption of the upper left first permanent molar (#14 or 26).

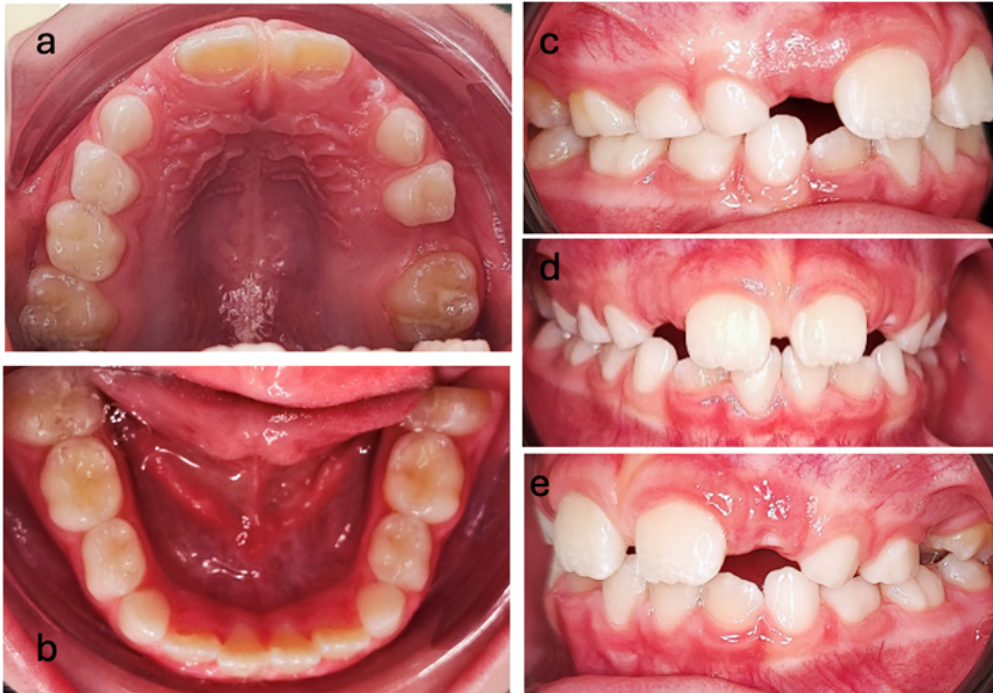
Upon clinical and radiographic examination, the following was noted: mesofacial biotype, with a harmonious profile, and slight transverse asymmetry (Image 1). Mixed dentition, first transitional period, Angle Class I malocclusion on the right and Class II on the left, bilateral normocclusion of canines, tooth #J (65) absent, mesial inclination of tooth #14 (26) (upper left first permanent molar) due to the premature loss of #J (65), causing a loss of space necessary for the correct eruption of #13 (25) (Images 2 and 3).

The treatment objective is to regain the lost space by distalizing tooth #14 (26) to maintain the regained space for the eruption of the successor teeth. Additionally, the goals are to promote a functional eruption, prevent crowding of posterior teeth, avoid the extrusion of the antagonist, and preserve the dental arch length.

The treatment plan involves the use of a removable appliance with a distalizing screw



**Image 1.** Extraoral photographs a) Frontal smile; b) Frontal lips at rest; c) Right profile.



**Image 2.** Intraoral photographs a) Upper occlusal b) Lower occlusal c) Right lateral d) Frontal e) Left lateral.



**Image 3.** Initial panoramic radiograph.

that will act as a space regainer (Image 4), with a weekly activation, which implies 0.25 mm of weekly earnings. The active phase of the treatment lasted 6 months, with a total of 12 months of monthly clinical and radiographic check-ups. The maintenance phase included a removable appliance with an artificial tooth in the

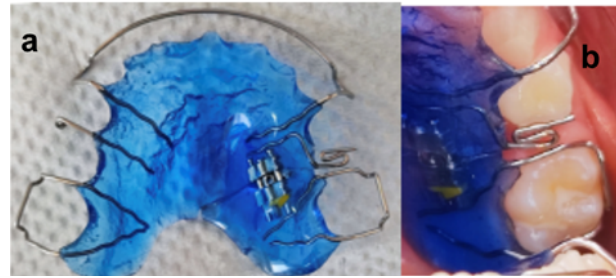
edentulous area to prevent extrusion of the antagonist and a central screw activated monthly to accompany the growth of the dental arch.

The patient was discharged with follow-up and scheduled for a check-up in 3 months to evaluate the anomalous eruption path

of the upper canines; he did not attend. Finally, the patient returned for a check-up 16 months later at 10 years and 1 month of age (Images 6 and 7): tooth #13 (25) was in the mouth with no space issues, and tooth #12 (24) was erupting. Tooth #6 (13) was at high risk of impaction.

Regarding the results obtained, radiographically, the complete distalization of #14 (26) and recovery of the lost space were achieved (Image 5). Clinically, the position of #14 (26) was corrected, and space was preserved for the eruption of #13 (25). Furthermore, in terms of functional aspects, a proper occlusion was established, and the arch length was preserved long-term.

It should be noted that all clinical photographic and imaging records related to the stages of the case report were previously requested and informed consent from the patient's responsible guardian.



*Image 4. a) Removable appliance with distalizing screw: b) Zoom of the active area.*



*Image 5. Panoramic radiograph at the end of the active treatment phase.*



*Image 6. Panoramic radiograph 16 months after finishing the active treatment phase.*



**Image 7.** Intraoral photographs. a) Upper occlusal; b) Frontal; c) Right lateral; d) Left lateral.

## Discussion

The use of removable space regainers with a distalizing screw has proven to be an effective, accessible, and minimally invasive solution for correcting ectopic eruptions of the FPM<sup>9,12</sup>. This approach is particularly relevant in contexts with limited resources, such as public health care centers, where the availability of more complex methods may be restricted<sup>7,8</sup>. The commitment and collaboration of the patients and their guardians are necessary to achieve an optimal resolution in these cases. However, there is no significant difference in the results obtained when comparing the use of removable and fixed appliances<sup>13</sup>.

The literature emphasizes that early management of ectopic eruption can prevent future complications and reduce the need for more invasive and prolonged

orthodontic treatments<sup>1,4</sup>. Kupietzky and Soxman highlight that timely intervention can prevent the impaction of second premolars and minimize the need for advanced and complex orthodontic devices such as fixed mechanical distalizers<sup>4</sup>.

Furthermore, methods like the pendulum and the helical retractor have been reported as effective solutions for distalizing molars in mixed dentition. However, these techniques require greater infrastructure and technical expertise, which limits their application in some clinical contexts<sup>9,12</sup>. Comparatively, the use of a removable distalizing screw is more practical and adaptable for a wider variety of clinical settings, being especially useful in contexts with limited resources.

Therefore, timely diagnosis and a therapeutic approach using this technique

allow for a successful resolution of the ectopic eruption of the first permanent molar. This helps to limit the extent of malocclusions and reduce the possibility of prolonged, aggressive, and complex orthopedic treatments<sup>14</sup>.

From a biological perspective, dental eruption is influenced by systemic and local factors, including chemical mediators present in the pericoronal tissues. Recent studies have identified the involvement of mast cells and other inflammatory cells in the eruptive process. These cells release inflammatory mediators such as histamine and proteases, which play a role in the bone remodeling necessary for dental eruption<sup>6</sup>.

In this context, the removable distalizing screw not only facilitates the correction of the FPM's eruptive path but also minimizes inflammation and other side effects associated with more invasive techniques. This approach, therefore, allows for an effective correction of the ectopic eruption without compromising the surrounding soft or hard tissues.

The greater trabecular structure and spongy bone present in the maxilla support the faster movement of teeth and the achievement of greater distances in distalization processes when compared to the application of these treatments in the mandible<sup>13</sup>.

Access to low-cost solutions like the removable distalizing screw can have

a significant impact on communities with limited resources. Its ease of use and effectiveness make it an ideal tool for public health programs focused on the prevention and management of malocclusions in early stages<sup>8,11</sup>.

## Conclusion

The early and effective treatment of the ectopic eruption of the first permanent molar is key to preventing future complications, such as loss of space and severe malocclusions. The application of a removable space regainer with a distalizing screw proved to be an effective, low-cost, and easy-to-implement technique, suitable for clinical environments with limited resources.

This technique not only allows for the correction of the first permanent molar's eruptive path but also promotes a proper functional eruption, minimizing the need for more complex orthodontic treatments in the future. In conclusion, this method should be considered a fundamental tool within interceptive orthodontics, but it requires the commitment and collaboration of the patient and their guardians.

## Conflicts of Interest and Funding

No conflicts of interest or associated funding sources.

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Correspondencia: Gustavo González Gratz, correo: gustavo.gonzalez@uv.cl