

Management of Unilateral Mandibular Space Loss Using a Modified Gerber Space Regainer in a 7-year-old Child: A Case Report

Abstract

Premature loss of primary teeth during the mixed dentition period may result in mesial migration of adjacent teeth, leading to loss of arch length and space deficiency for the eruption of permanent successors. Space regaining appliances play an important role in interceptive orthodontics, and the Gerber space regainer is a commonly used fixed appliance for this purpose, though modifications may improve its clinical applicability and ease of use. A 7-year-old child presented with unilateral space loss in the mandibular arch following premature extraction of a primary molar. Clinical and radiographic examination revealed mesial drift of the permanent first molar with inadequate space for eruption of the succedaneous tooth. A modified Gerber space regainer was fabricated and cemented to achieve controlled distal movement of the permanent first molar and recovery of the lost space. At follow-up, the desired amount of space was regained within a short treatment period of 2 months, after which the appliance was adjusted to maintain the achieved result and facilitate normal eruption of the permanent successor. The appliance was well tolerated, showed good stability, and required minimal chairside adjustments, with no significant soft tissue irritation or complications observed. The case highlights that the modified Gerber space regainer can be a simple, cost-effective, and clinically efficient option for managing unilateral space loss in mixed dentition, offering practical advantages in selected interceptive orthodontic situations.

Introduction

Premature loss of primary teeth is a frequent finding in pediatric dental practice and can significantly affect the developing occlusion. It often leads to mesial migration of adjacent teeth, reduction in arch length, crowding, and disturbances in the eruption pathway of permanent successors. The extent of space loss depends on multiple factors such as the child's age, the tooth involved, stage of dental development, occlusal forces, and the time elapsed since extraction. In the mixed dentition period, these changes can occur rapidly due to the dynamic nature of eruptive forces and skeletal growth.

Early diagnosis and timely interceptive management are therefore essential to preserve arch integrity and guide the developing occlusion toward a more favourable outcome. Failure to address space loss at an early stage may result in complex malocclusions requiring prolonged orthodontic treatment in the permanent dentition stage.

When space loss has already occurred, space-regaining procedures become necessary to re-establish the required arch length and allow proper eruption of succedaneous teeth. A variety of removable and fixed appliances have been described for this purpose. Removable appliances are often dependent on patient compliance and may not always produce predictable results in young children. In contrast, fixed appliances are preferred in many interceptive cases because they deliver continuous force, provide better control of tooth movement, and are less dependent on cooperation.

The Gerber space regainer is a fixed appliance designed to regain lost space through distal movement of the mesially migrated molar using an open-coil spring mechanism. It is considered relatively simple in design and effective in unilateral space loss cases. However, in certain clinical situations, modifications in appliance design may be required to improve anchorage control, enhance stability, simplify clinical management, or adapt to specific occlusal conditions.

The present case report describes the management of unilateral mandibular space loss following premature extraction of a primary molar using a modified Gerber space regainer in a 7-year-old child with a congenitally missing mandibular lateral incisor. The appliance achieved rapid and controlled space recovery while maintaining arch stability, thereby highlighting its clinical usefulness as an interceptive orthodontic option in carefully selected cases.

Case Report

A 7-year-old female child reported to the Department of Pediatric and Preventive Dentistry with the chief complaint of multiple decayed teeth and concerns from parents regarding developing irregular alignment of the lower anterior teeth. The parents also expressed anxiety regarding spacing issues and the possibility of future malocclusion.

On clinical examination, multiple carious lesions were noted. 84 was extracted 6 months before and space maintainers were not done then. On 74, 75, and 85 had deep caries and indicated for pulpectomy procedures. Endodontic treatment was completed in these teeth, followed by restoration with stainless steel crowns.

In this case, there was also a congenitally missing mandibular right lower incisor (42), which was confirmed through radiographic evaluation. A panoramic radiograph was advised both to confirm the congenital absence and to assess the developing permanent dentition. (fig 1)

The patient and parents were particularly concerned about the developing crowding and potential malalignment of the mandibular arch. A diagnostic study model analysis was performed, which revealed a space loss of more than 5 mm in the lower right posterior region. There was also a mesial drift of the 46 reducing the arch length. (fig 2)

Thus, Space regainer had to be done. In a similar case before, a fixed Hotzlingual regainer was done, which produced labial tipping of lower anteriors. When informed of labial proclination of teeth, parent was worried and wanted alternative methods if possible.

A conventional Gerber space regainer could not be done due to the absence of 84 and theneed for better anchorage control. Therefore, a modified Gerber appliance was designed as an extension of a lingual arch as the lower anteriors had erupted. The appliance design included bands on the permanent mandibular molars as well as on the crown of 85, ensuring adequate anchorage and stability (fig 3)

The appliance was fabricated and cemented successfully. On insertion, proper fit and stability were confirmed. The patient was instructed regarding maintenance and oral hygiene. In follow-up visit, the appliance demonstrated good stability, and progressive space recovery was observed in the affected quadrant. A space of 6 mm was regained with no labial tipping

of anteriors (fig 4). The appliance was not removed, but continued as a retentive appliance for 1 month followed by lingual arch space maintainer. Patient expressed no discomfort while wear of the appliance throughout the treatment.

Following a retention period of one month, the patient was fitted with a passive lingual arch to maintain the regained space and was advised to undergo routine follow-up evaluations at 3–4-month intervals. At the 4-month review, the appliance was found to be stable, with no clinically evident space loss. The patient remained asymptomatic, and the treatment outcome was satisfactory. Regular follow-up visits at 3-month intervals were recommended to monitor space maintenance and the eruption of the succedaneous teeth. (fig 5, 6)

Discussion

Space maintenance and space regaining are essential components of interceptive orthodontics, particularly in the mixed dentition stage where eruptive changes occur rapidly. Premature loss of primary teeth can disrupt the natural balance of eruptive forces, resulting in mesial drifting of adjacent teeth, reduction in arch perimeter, and eventual crowding or impaction of permanent successors. In the present case, early extraction of a primary molar resulted in significant unilateral space loss exceeding 5 mm, necessitating active intervention.

Management of such cases requires careful consideration of multiple factors, including skeletal growth pattern, dental development stage, occlusal relationships, and presence of congenital anomalies. In this case, the presence of a congenitally missing mandibular lateral incisor added complexity to the occlusal environment, as it contributed to altered anterior tooth distribution and required careful maintenance of arch symmetry during treatment.

Various treatment modalities have been proposed for space regaining in the mixed dentition. These include removable appliances such as plates with springs, functional appliances, and fixed appliances such as coil spring-based systems, lip bumpers, and specialized space regainers like the Gerber appliance. Each modality has its own indications, limitations, and biomechanical considerations.

Removable appliances such as the Hotz appliance are commonly used in pediatric orthodontics due to their simplicity and ease of fabrication. However, their effectiveness is highly dependent on patient compliance and may not be ideal in cases requiring precise and continuous force application. In the present case, a removable appliance was avoided due to existing anterior proclination, as uncontrolled forces could worsen incisor flaring and compromise treatment outcomes.

The conventional Gerber space regainer is widely used for unilateral space loss cases and functions through an open-coil spring mechanism that generates distalizing force on the mesially migrated molar. While effective, its anchorage system may not always provide adequate stability in cases where multiple teeth require protection or where arch integrity is already compromised.

To overcome these limitations, a modified approach integrating the Gerber mechanism with a lingual arch was utilized. The lingual arch component provided passive stabilization of the anterior segment and maintained arch form, while the active Gerber component delivered controlled distalizing forces to the permanent first molar. The lingual arch served as a stable

anchorage unit by distributing reactive forces across the mandibular arch, thereby minimizing unwanted tooth movement. It also helped maintain the position of anterior teeth and preserved arch form during active space regaining.

Biomechanically, this combination allowed for controlled distal movement of the molar while ensuring that reactive forces were dissipated effectively. The modification enhanced treatment efficiency and reduced the need for frequent adjustments. Additionally, it provided improved patient comfort and better control over tooth movement direction.

Conventionally space regainers are not required in cases with congenitally missing teeth, but in this case, there was no excess space in the anteriors and also definitive space loss that required intervention in the lower right quadrant.

Another important aspect in this case was the role of restorative treatment performed prior to orthodontic intervention. Stainless steel crowns placed after pulpectomy of multiple primary molars helped maintain occlusal height, prevent further breakdown of crown structure, and preserve space indirectly by maintaining proper proximal contacts. This contributed to a more stable environment for the orthodontic appliance to function effectively.

Overall, this case demonstrates that individualized appliance design plays a critical role in successful interceptive orthodontic treatment. Standard appliances may not always be sufficient in complex clinical situations, especially when multiple factors such as congenital tooth absence, space loss, and altered anterior alignment coexist. Early diagnosis, careful planning, and modification of conventional appliances can significantly improve treatment efficiency and long-term occlusal outcomes.

Conclusion

This case highlights the importance of early diagnosis and timely interceptive intervention in managing space loss during the mixed dentition period. A modified Gerber space regainer supported by a lingual arch effectively achieved controlled space regaining while maintaining mandibular arch stability in a child with multiple complicating factors. Individualized treatment planning, careful biomechanical considerations, and appropriate appliance modification are essential to restore arch length, guide eruption of permanent teeth, and prevent the development of future malocclusion.

Figures-



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160 Fig 1 - Panoramic radiograph Pre Op



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162 Fig 2 - Pre Operative Occlusion



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164 Fig 3- Intra oral photograph on the day of luting – Dec 5 2025



Fig 4 -Intra oral photograph at the first review - Feb 6 2026



Fig 5 - Intra oral photograph after 7 months – July 4 2026



Fig 6 - Post operative occlusion

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