Space Loss After Removal of a Band and Loop Space Maintainer: A Case Report and Review of the Literature.

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ABSTRACT/INTRODUCTION

Premature loss of a first primary molar can occur due to a multitude of reasons, including caries and infection. When this occurs and restoration of the affected primary tooth is not possible, the AAPD recognizes space maintenance as a "Best Practice" to prevent loss of arch length, width, and perimeter after extraction. However, reports suggest that with proper intercuspation of first permanent molars, space loss from premature loss of a first primary molar is minimal and space maintainers in that area may not be needed. This case report details an 8-year-old female who had significant space loss between the mandibular primary canine and mandibular second primary molar after removal of her band-and-loop space maintainer post-eruption of tooth #19. Patient's medical history is non-contributory, and she has no known allergies. This report reviews the pertinent literature regarding space management in the mixed dentition and outlines factors to be considered in making clinical decisions regarding such management.

CASE REPORT

An 8-year-old female presented to the Children's Mercy Hospital of Kansas City (CMH) Dental Clinic in October 2023 for a 6 month recall appointment. Upon clinical examination, significant space loss was noted on the lower left between tooth #K and tooth #M. The patient's history showed that in November 2020, she had #L extracted due to non-restorability. Two weeks after extraction, a traditional de-novo band and loop space maintainer was placed extending from #K to #M. In March 2021, patient presented again to CMH with a chief complaint of soft tissue irritation due to the band and loop being mobile. At that appointment, #19 was present in the mouth, so the resident removed the appliance. At subsequent appointments, space loss was noted in the area of extracted #L. In October 2023, space loss had become significant, with #K and #M almost contacting each other. Patient and parent denied any symptoms of soreness or food-packing in that area. A bitewing radiograph was taken which confirmed both mesial drifting and tipping of #K, with possible distal drifting of #M. The absence of space between #19 and #K suggest that the first permanent molar had also drifted mesially from its original erupted position. An occlusal exam reveals crowding in the anterior, with a Class III molar relationship on the left, but a Class I molar relationship on the right.

Our orthodontist on staff was consulted, who suggested the anterior crowding could have been redistributed posteriorly, combined with a Class III growth tendency to create this pattern of significant space loss. We will continue to monitor the patient closely so a referral to orthodontics can be made appropriately.

Figure 1: November 3, 2020

Figure 2: March 4, 2021

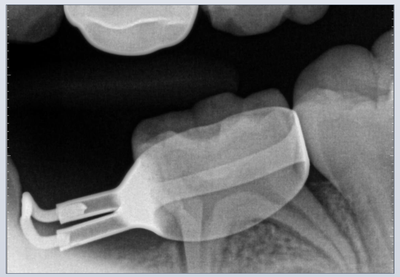

Figure 3: January 6, 2023

Figure 4: October 10, 2023

DISCUSSION/CONCLUSION

Space loss in the mandible after first primary molar extraction is caused by both mesial movement of the teeth distal to the space and distal movement of the teeth mesial to the extraction space. However, evidence shows that distalization is the predominating factor.[4] This contrasts with the maxilla, where, again, both mesial and distal movements are noted, but mesialization of the distal teeth is the main influence. With this patient's existing anterior crowding, but also the class III molar relationship on the affected side, it leads us to believe that both distal and mesial movements are occurring.

Tunison et. al (2008) also make note that if a tooth is extracted due to interproximal caries (see Fig. 1) that space loss can occur even before extraction. In this case, they make the argument that pretreatment planning needs to be thorough, and in combination with anterior crowding, space maintenance could be important to avoid distal redistribution.

This clinical case conflicts with what guidelines have suggested regarding timing of space maintenance in a mixed dentition.[2] Literature has shown that when a first primary molar is extracted, space loss is minimal if the first permanent molars are in proper intercuspation. However, there is also evidence to suggest that when anterior crowding is present, space maintenance is even more vital to prevent distalization into the open space.[4] Although evidence-based dentistry is a must, this clinical case highlights the need to combine this knowledge with appropriate care directed to our patients to treat them and their specific needs. It further highlights the importance of assessing the overall occlusal status for each patient in determining the need for interventions regarding space management.

REFERENCES

1. American Academy of Pediatric Dentistry. Management of the developing dentition and occlusion in pediatric dentistry. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2023:466-83.
2. Law, C. S. (2013). Management of premature primary tooth loss in the child patient. Journal of the California Dental Association, 41(8), 612-618.
3. Nowak, A.J., Christensen, J.R., Mabry, T.R., Townsend, J.A., Wells, M.H. (2018). Space maintenance in the primary dentition. 6th Edition Pediatric Dentistry, (pp. 379-85).
4. Tunison, W., Flores-Mir, C., ElBadrawy, H., Nassar, U., & El-Bialy, T. (2008). Dental arch space changes following premature loss of primary first molars: a systematic review. Pediatric dentistry, 30(4), 297-302.