

Introduction

- Premature loss of primary teeth may have several adverse outcomes - loss of space within the dental arch, ectopic eruption, impacted teeth, Angle's class II or III occlusion, asymmetry in molar relationship, and midline deviation.
- The effects of premature loss of primary teeth on space loss and the need for orthodontic treatment have been reported in the literature. However no investigator has specifically studied the influence of tooth loss on asymmetry in molar relationship and midline discrepancies, two problems that can complicate orthodontic treatment.
- The purpose of this retrospective study was to determine the association of premature loss of primary teeth with discrepancies in midline and molar relationship.

Materials & Methods

- This Retrospective pilot study was conducted at the University of California, Los Angeles at the Children's Dental Center, in the Section of Pediatric Dentistry.
- Each Study model was evaluated for the following:**
 - Midline Discrepancy** Midlines were coincident if the Mandibular midline was within +/- 1 mm to the right or left of the Maxillary midline. Anything more than that was considered midline discrepancy. Distances were recorded from maxillary to mandibular midline. If there was a diastema, the measurement was estimated to be the midpoint between the mesial surfaces of maxillary central incisors.
 - Molar relationship** using Angle's molar classification
 - Asymmetric molar relation.** Distance measured between the mesiobuccal cusps of the maxillary first permanent molars to the buccal grooves of the mandibular first permanent molar. The left molar distance was subtracted from the right molar difference to yield asymmetric molar relationship if the molar classification was the same, added together if the molar classification was different.

Materials & Methods (cont'd)

4. Posterior Crossbite: As none or unilateral crossbite present

A digital caliper was used to record all measurements. Each measurement was recorded by three different examiners among four investigators (AW, LH, RM, HD). The average measurement was recorded as the final measurement for analysis. Paired T-test was used for statistical analysis using R.

Results

- A total of 515 study models were analyzed, of which 155 met the inclusion criteria of being in the mixed dentition stage. 360 models in the primary and permanent dentition stage were excluded from data analysis.
- The presence of unilateral posterior crossbite was included in the data analysis because of its association with both midline discrepancy and asymmetric molar relationship.

Table 1. Percentage prevalence of midline discrepancy and asymmetric molar relationship in patients with premature tooth loss and unilateral posterior crossbite during mixed dentition stage.

Samples in mixed dentition (n=155)	Premature Loss Of Primary Teeth	Unilateral Posterior Crossbite
Midline discrepancy (62%)	56%	20%
Asymmetric molar relationship (49%)	44%	17%

Table 2. Effect Of Premature Loss Of Primary Teeth and Posterior Crossbite on Asymmetric Molar Relationship.

Premature loss / Posterior cross bite	Premature loss	No premature loss
Posterior cross bite	2.34 ± 2.06 (n=4)	3.15 ± 2.38 (n=14)
No posterior cross bite	4.21 ± 3.21 (n=43)	3.16 ± 2.69 (n=70)

Subjects with premature loss of primary teeth exhibited a higher mean midline discrepancy value for asymmetric molar relationship than control subjects. (no premature loss, no posterior crossbite). However there was no statistical significant difference between the two groups. (p = 0.06)

Results (cont'd)

Table 3. Effect of premature loss of primary canines and unilateral posterior crossbite on midline discrepancy

Premature loss / Posterior cross bite	Premature loss	No premature loss
Posterior cross bite	3.48 ± 0.24 (n=2)	1.23 ± 1.36 (n=12)
No posterior cross bite	1.07 ± 0.96 (n=57)	1.13 ± 1.29 (n=21)

- Subjects with premature tooth loss and unilateral posterior crossbite exhibited a higher mean midline discrepancy value than subjects with premature tooth loss but without unilateral posterior crossbite. (p=0.02.)
- Subjects with premature tooth loss and unilateral posterior crossbite exhibited a higher mean midline discrepancy value than control subjects. (no premature loss, no posterior crossbite.) (p < 0.001)
- No difference was found between subjects with and without premature loss of primary canines. However, this may be attributed to data samples with bilateral loss of canines. (53% of data sample had bilateral loss of primary canines.) (p= 0.84)

Conclusions

- Individuals with premature loss of primary molars may show tendencies toward asymmetric molar relationships and midline discrepancies.
- The combination of unilateral posterior crossbite and premature loss of primary canines appears to have an adverse effect on midline discrepancy, worse than that of unilateral posterior crossbite alone.
- A greater sample size is required to demonstrate significant differences.
- All the data, including that for the control group, was collected from subjects who visited the CDC for orthodontic consultation and therefore are not representative of the general population.

References

- Prevalence of malocclusion in relation to premature loss of primary teeth . Pederson J, Stensgaard K Melsen B.
- Effect of premature loss of deciduous canines and molars on malocclusion of permanent dentition . W. Miyamoto, C.S.Chung, P.K.Yee.