Submitted: 17 March, 2026 Accepted: 02 July, 2026 Published: 03 November, 2026 DOI:10.22514/jocpd.2026.139

REVIEW

Journal of Clinical Pediatric Dentistry

Clinical consequences of premature loss of primary molars: a narrative literature review

Hibeth Félix Fernández[1], Katherine Jeanette Campos Campos[2,*]

[1]School of Dentistry, Universidad Científica del Sur, 15067 Lima, Perú
[2]Department of Pediatric Dentistry, School of Dentistry, Universidad Científica del Sur, 15067 Lima, Perú

***Correspondence**
kcampos@cientifica.edu.pe
(Katherine Jeanette Campos Campos)

Abstract

The premature loss of primary molars in children during the transition from primary to early mixed dentition is a dental condition that may affect the development of the masticatory system and the eruption of permanent teeth. This study is a narrative critical review of the literature aimed at analyzing and synthesizing the clinical consequences associated with premature loss of primary molars in children. A structured literature search was conducted in PubMed, Scopus, and SciELO databases for studies published between 2009 and 2024 in English and Spanish. A combination of Medical Subject Headings (MeSH) terms and free-text keywords was used to identify relevant studies. Eligibility criteria were applied to select studies involving children during the transition from primary to early mixed dentition that reported clinical consequences of premature loss of primary molars. The selected evidence was critically analyzed and narratively synthesized. A total of 58 records were identified, of which 19 studies were included in the final synthesis. The included studies reported clinical consequences such as loss of arch space, occlusal alterations, early eruption of permanent teeth, dental crowding, mesial tipping of permanent molars, and tooth impaction. The effects varied depending on the location and type of molar affected. In conclusion, premature loss of primary molars is associated with clinically significant alterations in occlusion and space maintenance during mixed dentition development.

Keywords

Early loss; Premature loss; Primary molars; Deciduous molars

1. Introduction

Primary dentition plays a fundamental role in the functional and harmonious development of the pediatric stomatognathic system, ensuring effective mastication and maintaining the arch space required for the correct eruption and alignment of permanent teeth. In particular, primary molars are essential for preserving arch length and guiding the correct spatial development of the permanent dentition [1].

Premature loss of primary molars is a frequent condition in pediatric dentistry that disrupts the normal development of occlusion and eruption patterns. It is defined as the loss of a primary tooth occurring significantly earlier than its physiological exfoliation time, typically at least one year before expected shedding or before the permanent successor reaches Nolla stage six, when crown formation is completed and root development has begun [2].

Although dental caries has been identified as the main cause of tooth loss in children, other conditions such as trauma, eruption disturbances, congenital anomalies, and therapeutic extractions also contribute to early loss of primary molars [3]. This condition may lead to multiple clinical consequences, including loss of arch space, midline deviation, occlusal alterations, ectopic eruption, and impaction of permanent teeth [4, 5].

Despite the existing literature on this topic, the evidence remains fragmented and heterogeneous, and previous reviews have not specifically focused on a critical synthesis of the clinical consequences of premature loss of primary molars within a well-defined early mixed-dentition period. This highlights a relevant gap in the literature regarding a focused and clinically oriented synthesis of the available evidence.

The early mixed dentition stage corresponds to a critical developmental period characterized by the eruption of the first permanent molars and incisors, during which the dental arch is particularly susceptible to space loss and occlusal disturbances following the premature loss of primary molars.

Therefore, the aim of this study is to provide a narrative critical review of the literature to analyze and synthesize the clinical consequences associated with the premature loss of primary molars during the transition from primary to early mixed dentition, based on a structured and transparent search of the available evidence.

2. Materials and methods

This study is a narrative critical review of the literature aimed at synthesizing and critically analyzing the clinical consequences

This is an open access article under the CC BY 4.0 license (https://creativecommons.org/licenses/by/4.0/).
 ©2026 The Author(s). Published by MRE Press.

of the premature loss of primary molars in children.

2.1 Research question and framework

The research question was structured using the PECOs framework: Population: children in the transition from primary dentition to mixed dentition; Exposure: premature loss of primary molars; Comparison: no tooth loss or different timing of loss; Outcome: clinical consequences such as space loss, occlusal alterations, and eruptions disturbances.

2.2 Literature search strategy

A structured literature search was conducted in PubMed/Medline, Scopus, and SciELO databases. The search was performed using a combination of Medical Subject Headings (MeSH) terms and free-text keywords related to primary molars, tooth loss, children, and dental arch alterations. Boolean operators were used to combine search terms and improve sensivity and specifity. Detailed search strategies are provided in Table 1.

2.3 Time frame and language

The search was limited to studies published between 2009 and March 2024 in English and Spanish. This timeframe was selected to ensure inclusion of contemporary evidence reflecting pediatric dental practices and diagnostic approaches.

2.4 Eligibility criteria

Eligible studies included observational designs (cross-sectional, cohort, and case-control studies) evaluating the clinical consequences of premature loss of primary molars in children during the transition from primary dentition to early mixed dentition. Case reports, letters, abstracts, and review articles were excluded.

2.5 Study selection

Titles and abstracts were screened based on the eligibility criteria, followed by full-text review. Study selection was conducted to ensure consistency in inclusion.

2.6 Data extraction

Data from included studies were extracted into a standardized synthesis matrix using Mendeley, including study characteristics, population, methods, and main outcomes.

3. Results

A total of nineteen observational studies were included, comprising nine cross-sectional and ten longitudinal designs. The study identification and selection process is summarized in Fig. 1.

Structured clinical observation was the most frequently employed data collection method. Additional assessment methods included radiographic techniques (digital panoramic, cephalometric, and periapical), study models, intraoral clinical examinations, and photographic documentation. These studies evaluated different clinical consequences associated with premature loss of primary molars, including loss of arch space, tooth displacement, eruption disturbances, and occlusal alterations (Table 2, Ref. [4, 6–23]).

The main findings obtained were classified into five categories:

3.1 Changes in the dimensions of the arch and perimeter of the arch

At least 6 studies identified significant modifications in the D + E (sum of mesiodistal widths of the first and second primary molars) and C + D + E (sum of mesiodistal widths of the canine, first molar and second primary molar) space after premature loss of primary molars, suggesting a reduction in the arch perimeter and available mesiodistal spaces [4, 6–10]. An increase in intercanine width and length, associated with the distalization of the primary canine, was reported [10].

Loss of the mandibular second molar was associated with significant changes in the extraction space and arch hemiperimeter. In contrast, the loss of maxillary second molar changes resulted in only minor alterations [4]. One study reported a significant reduction in arch perimeter in nearly all evaluated children [6], while another found an increase in maxillary posterior arch length accompanied by decrease in the mandibular arch length [8].

3.2 Tooth displacement and movement

Ten studies reported tooth movements after premature loss, the magnitude of which varied according to the tooth extracted [4, 6, 8, 10–16]. The loss of primary first molars was associated with mesial migration of the second molars and distal inclination of the primary canines, affecting both the maxilla and the mandible [8, 13].

Conversely, the loss of second primary molars resulted in

TABLE 1. Summary of database searches, key terms, and records identified.

Database	Date of search	Search terms (summary)	Records identified
PubMed/Medline	March 2024	MeSH + keywords related to primary molars, tooth loss, children, dental arch, occlusion, eruption	38
Scopus	March 2024	MeSH and free-text terms related to primary molars and tooth loss in children	12
SciELO	March 2024	MeSH + Spanish/English keywords related to premature tooth loss and dental arch changes	8
Total			58

MeSH: Medical Subject Headings.

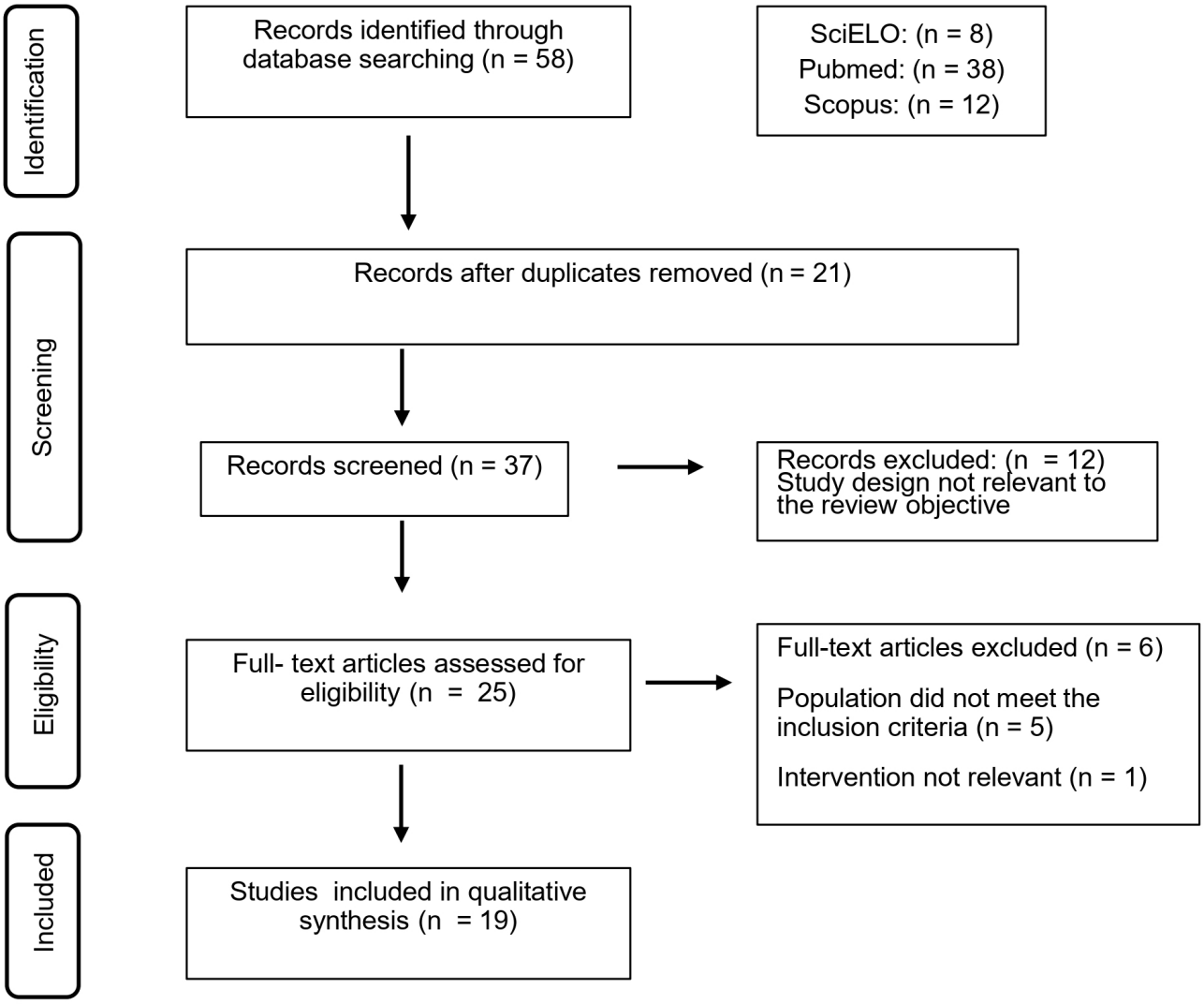


FIGURE 1. Study selection process flow diagram.

slight mesial migration of the first permanent molars in children aged 6 to 9 years [12, 14].

3.3 Effects on occlusion and dental midline

Four studies showed that premature loss influenced molar relationships, bite type, and midline position [6, 13, 17, 18]. Midline deviations were evident in 42% of children aged 5–10 years [6], although other studies only reported slight deviations towards the extraction side in 4.3% of cases [13].

Children under 7 years of age showed an association between premature dental loss and development of anterior crossbite [17]. Furthermore, more pronounced occlusal changes were observed when the premature loss involved primary canines or second primary molars [18].

3.4 Loss of space and overcrowding

Eight studies evaluated space loss, showing that it increases in the first months after extraction [7, 15, 16, 19–23]. Facial growth initially mitigated the effects of the loss, but its impact increased progressively over time [19].

Greater loss was observed in children with end-occlusion [19] and in those with Class II molar relationships compared with Class I [21]. Loss was minimized when the first permanent molar had already erupted at the time of extraction [15, 20].

Regarding crowding, findings were contradictory: one study found little crowding on the extraction side [21], whereas another reported a high prevalence of crowding without directly associating it with space loss [23].

3.5 Impact on the eruption and position of permanent teeth

Four studies analyzed the influence of premature loss on the eruption and position of permanent teeth [4, 11, 12, 15]. Mesial inclination of the first permanent mandibular molar was observed following the loss of the second primary molar [11, 15], as well as an acceleration of the eruption of the premolars in cases of bilateral losses within same quadrant [11].

In the maxilla, mesial inclinations and mesiorotations of the first permanent molars were reported [12, 15].

Some studies also reported displacement of adjacent primary teeth and stress on immature roots of permanent first molars, both of which were reduced with the use of space maintainers [12, 14].

TABLE 2. Characteristics of the included studies.

Author and year	Sample and age	Study design	Methodology	Follow up	Main Objective	Clinical consequences
Alexander *et al.* [19] (2015)	n = 226 Age: 7–8 yr	Longitudinal	Intraoral examinations with digital calipers	9 mon	To evaluate space changes after premature molar loss	Loss of space
Alnahwi *et al.* [20] (2015)	n = 87 Age: 3–12 yr average age: 7.75 yr	Longitudinal	Bitewing and periapical radiographs	6–48 mon	To assess arch changes over time	Loss of space
Bindayel *et al.* [21] (2019)	n = 32 Age: 8–9 yr	Longitudinal	Study models and initial and follow-up radiographs	6 mon	To analyze space reduction after extraction	Loss of space
Cernei *et al.* [12] (2015)	n = 112 Age: 6–9 yr	Cross-sectional	Digital panoramic radiographs	NR	To evaluate tooth movement patterns	Tooth displacement and movement Impact on the eruption
Cernei *et al.* [11] (2016)	n = 85 Age: 6–9 yr	Cross-sectional	Digital panoramic radiographs	NR	To assess eruption alterations	Tooth displacement and movement Impact on the eruption
Díaz *et al.* [6] (2024)	n = 113 Age: 5–10 yr	Cross-sectional	Panoramic and periapical radiographs, clinical histories	NR	To evaluate occlusal and spatial changes	Changes in the arc perimeter Tooth displacement and movement Effects on occlusion and midline
García *et al.* [17] (2011)	n = 44 Age: 4–15 yr	Retrospective, longitudinal	Medical records, photographs and X-rays	3 yr	To analyze occlusal effects of early loss	Effects on occlusion
Gomide *et al.* [7] (2020)	n = 235 Age: 6–7 yr	Cross-sectional	Occlusal photographs and study models	NR	To evaluate arch perimeter changes	Changes in the perimeter of the arch Loss of space
Heidari *et al.* [13] (2022)	n = 47 Age: 8–10 yr	Cross-sectional	Study models	NR	To assess occlusal changes	Tooth displacement and movement Effects on occlusion and midline
Kobylińska *et al.* [8] (2019)	n = 27 Age: 5–7 yr	Longitudinal	Initial and control study models	1–12 mon	To evaluate arch dimension changes	Tooth displacement and movement Changes in arch dimensions
Lin YT *et al.* [10] (2011)	n = 13 Age: 5 yr 4 mon–6 yr 4 mon	Longitudinal	Study models	6–12 mon	To evaluate arch dimension changes	Changes in arch dimension and arch perimeter
Lin YT *et al.* [9] (2017)	n = 9 Age: 5 yr 1 mon–7 yr 7 mon	Longitudinal	Initial and control study models	81 meses	To assess long-term arch changes	Changes in the dimensions of the arch

TABLE 2. Continued.

Author and year	Sample and age	Study design	Methodology	Follow up	Main Objective	Clinical consequences
Lucas *et al*. [22] (2019)	n = 17 Age: 6–8 yr	Cross-sectional	Study models	NR	To evaluate space loss	Loss of space
Macena *et al*. [4] (2011)	n = 55 Age: 5–9 yr	Longitudinal	Study models, periapical radiograph	3–10 mon	To analyze arch changes	Changes in the dimension and perimeter of the arch Tooth displacement and movement Impact on the eruption
Mosharrafian *et al*. [23] (2021)	n = 50 Age: 6–8 yr	Cross-sectional	Clinical examination. Study models	NR	To assess occlusal effects	Loss of space
Park *et al*. [14] (2009)	n = 13 Age: 5–10 yr	Longitudinal	Study models, three-dimensional laser scanner	6–12 mon	To measure spatial changes	Tooth displacement and movement
Petcu *et al*. [15] (2009)	n = 94 Age: 6–10 yr	Cross-sectional	Digital Panoramic X-rays	NR	To evaluate eruption effects	Loss of space Tooth displacement and movement Impact on the eruption
Pokorna *et al*. [16] (2016)	n = 99 Age: 7–11 yr	Longitudinal	Study models and panoramic, lateral cephalometric radiographs	3 wk	To assess immediate space changes	Loss of space Tooth displacement and movement
Warkhandkar *et al*. [18] (2023)	n = 175 Age: 7–10 yr	Cross-sectional	Study models	NR	To evaluate occlusal changes	Effects on occlusion and midline

NR: Not reported.

4. Discussion

The findings of this review showed that premature loss of primary molars leads to multiple clinical consequences, the most common being reduction of the dental arch perimeter, displacement of adjacent teeth, occlusal abnormalities, and midline deviation. These abnormalities have been described in numerous studies that, although differing in design and population characteristics, consistently indicate a clear impact on oral development when timely treatment is not provided.

One of the most extensively studied consequences was the modification of dental arch dimensions. Macena *et al*. [4] and Lin *et al*. [10] reported a reduction in the posterior arch perimeter, particularly associated with distal displacement of primary canines as an adaptive response to the edentulous space. However, this response is not uniform and appears to vary according to the affected tooth and its location. Kobylińska *et al*. [8] observed significant inter-arch differences, reporting an increase in posterior maxillary arch length and a reduction in mandibular arch length, which may be explained by differences in bone morphology and eruption patterns specific to each arch.

Mesial displacement of primary second molars and distal tipping of canines were also common findings. This tendency of teeth to migrate into the space created by early loss underscores the importance of ongoing clinical follow-up and the use of space maintainers to preserve arch alignment and prevent orthodontic complications in the medium and long term [4]. These findings are consistent with a body of evidence from systematic reviews evaluating spatial changes after premature loss of first primary molars. Kaklamanos *et al*. [24] in a systematic review of controlled studies, reported a similar pattern of clinically relevant space reduction, reaching approximately 1.5 mm in the mandible and around 1 mm in the maxilla, although the clinical significance was considered variable depending on individual factors. More recently, Zhao *et al*. [25] confirmed these findings through a meta-analysis of split-mouth studies, demonstrating mean space losses of 0.65 mm in the maxilla and 1.24 mm in the mandible D + E space, reinforcing the tendency toward progressive space closure following premature extraction. In agreement with these findings. El-Motayam *et al*. [1] further quantified this effect and showed greater mandibular space loss (−1.78 mm) compared with the maxilla (−0.52 mm), highlighting the clinical relevance of mandibular extractions. Although all these reviews focus on first primary molars, collectively they support the pattern of mesial migration and reduction in arch space observed in the present study, reinforcing the need for individualized assessment and timely space management when indicated.

Regarding occlusion, several studies have shown dental midline deviations and the development of crossbites. Warkhandkar *et al*. [18] observed that unilateral loss of primary molars was associated with notable midline deviations, suggesting the presence of functional imbalance. Similarly, García *et al*. [17] identified an association between premature molar loss and the occurrence of anterior crossbite in children under 7 years of age, suggesting that occlusal effects may develop at an early stage. In contrast, Heidari *et al*. [13] reported less pronounced deviations in older children, possibly due to reduced occlusal adaptability with increasing age. These findings support the importance of early interventions to prevent long-term functional imbalances.

Dental space loss, particularly following the extraction of second primary molars, has been identified in the literature as a major contributor of dental crowding. These effects have been documented since 1887 [23], and subsequent studies quantified space loss in children between 5 and 7 years of age, reporting reductions of 1 to 1.5 mm within less than a year, mainly due to distal displacement of the canines [4]. However, conflicting evidence remains regarding whether this reduction is more pronounced in the maxilla or mandible, highlighting the importance of considering anatomical particularities in each case [10, 16].

Regarding the impact on the eruption of permanent teeth, Lucas-Rincón *et al*. [22] reported greater space loss in children presenting interproximal caries or tooth loss, without identifying significant differences according to sex, arch, or age. Conversely, Cernei *et al*. [11, 12] emphasized that premature loss may affect the vertical alignment of permanent molars, leading to mesial inclinations, particularly when both first primary molars are lost simultaneously.

A relevant finding was the increasing use of technologies such as 3D laser scanning and models generated by Cone-Beam Computer Tomography (CBCT) and Magnetic Resonance Imaging (MRI), which have improved the accuracy of dental arch assessment and facilitated more effective orthodontic appliance design [14]. However, the duration of follow-up among the reviewed studies showed considerable variability. Most performed short-term observations (less than 12 months) [4, 8, 10, 13–15, 19, 21] and only a few extended long-term observations [6, 9, 20], which could limit the comprehensive understanding of late effects.

This study presented certain limitations, including the limited availability of recent studies and the inclusion of samples comprising children between approximately 4 and 10 years of age. However, these age categories were not consistently aligned with standardized clinical definitions of dentition stage, which may have contributed to heterogeneity in participant classification across studies. This variability may affect the comparability and generalizability of the findings. Furthermore, most studies did not evaluate key variables such as sex or gender, limiting the possibility of exploring their potential influence on the observed clinical outcomes. In addition, the concept of “clinical consequences” has mainly been addressed from functional and morphological perspectives, whereas dimensions such as quality of life have received limited attention.

Despite the findings reported in the included studies, several important gaps in the current literature were identified. Considerable methodological heterogeneity was observed regarding study design, samples characteristic, follow-up duration, and outcome assessment methods, limiting direct comparison among studies. In addition, there is a limited number of long-term studies evaluating the progression of clinical consequences following premature loss of primary molars. Furthermore, the lack of standardized outcome measures highlights the need for future studies using more homogenous

methodologies and larger populations to strengthen the available evidence.

Overall, the results support the objective of this study by demonstrating that premature loss of primary molars is associated with a series of clinically relevant consequences that should be considered when designing preventive and intervention strategies. However, although the findings indicate clear trends, it is important to distinguish statistical significance and clinical relevance, particularly when making treatment decisions. Future studies should investigate whether early intervention using customized space maintainers may significantly reduce long-term occlusal changes through longitudinal studies with extended follow-up.

5. Conclusions

This literature review identified several clinical consequences associated with the premature loss of first and second primary molars in children during the transition from primary to early mixed dentition, including alterations in dental arch dimensions and perimeter, tooth displacement, occlusal and dental midline deviations, space loss and crowding, as well as disturbances in the eruption and positioning of permanent teeth. These findings highlight the importance of early diagnosis and timely intervention to minimize potential long-term effects on occlusal development.

AVAILABILITY OF DATA AND MATERIALS

All data are included in this review.

AUTHOR CONTRIBUTIONS

HFF and KJCC—designed the research study; performed the research; analyzed the data; wrote the manuscript. Both authors contributed to editorial changes in the manuscript. Both authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

ACKNOWLEDGMENT

Not applicable.

FUNDING

This research received no external funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

[1] El-Motayam AK, Hassan MA, Sadek MM, Fathalla R, Wahba N, Mahmoud R, *et al*. Extraction of first primary molars and significance of space loss: a systematic review and meta-analysis. BMC Oral Health. 2026; 26: 611.

[2] Shakti P, Singh A, Purohit BM, Purohit A, Taneja S. Effect of premature loss of primary teeth on prevalence of malocclusion in permanent dentition: a systematic review and meta-analysis. International Orthodontics. 2023; 21: 100816.

[3] Santos AGC, Machado CV, Telles PDS, Rocha MCBS. Early loss of deciduous molars in children assisted by the School of Dentistry of the University of Bahia. Odontologia Clínico-Científica. 2013; 12: 189–193. (In Portuguese)

[4] Macena MC, Tornisiello Katz CR, Heimer MV, de Oliveira e Silva JF, Costa LB. Space changes after premature loss of deciduous molars among Brazilian children. American Journal of Orthodontics and Dentofacial Orthopedics. 2011; 140: 771–778.

[5] Gandhi JM, Gurunathan D. Short- and long-term dental arch spatial changes following premature loss of primary molars: a systematic review. Journal of Indian Society of Pedodontics and Preventive Dentistry. 2022; 40: 239–245.

[6] Díaz-Valdés K, Iglesias-Iglesias MA, Fernández-Canino A, Pérez-Díaz MK, López-González M. Premature loss of primary teeth in school children. Revista de Ciencias Médicas de Pinar del Río. 2024; 28: e6173. (In Spanish)

[7] Gomide RT, Frencken JE, Leal SC, Kuijpers-Jagtman AM, Faber J. Impact of proximal cavities and primary molar absence on space in the dental arches. PeerJ. 2020; 8: e8924.

[8] Kobylińska A, Piekoszewska-Ziętek P, Gozdowski D, Turska-Szybka A, Olczak-Kowalczyk D. Spatial changes in the dental arch after premature extraction of the first primary molar: a 12-month observational study. New Medicine. 2019; 23: 96–104.

[9] Lin YJ, Lin YT. Long-term space changes after premature loss of a primary maxillary first molar. Journal of Dental Sciences. 2017; 12: 44–48.

[10] Lin YT, Lin WH, Lin YTJ. Twelve-month space changes after premature loss of a primary maxillary first molar. International Journal of Paediatric Dentistry. 2011; 21: 161–166.

[11] Cernei ER, Mavru RB, Zetu IN. Axial modifications of permanent lower molars after premature losses of temporary molars. Medical-Surgical Journal of the Society of Physicians and Naturalists, Iaşi. 2016; 120: 178–185.

[12] Cernei ER, Maxim DC, Zetu IN. The influence of premature loss of temporary upper molars on permanent molars. Medical-Surgical Journal of the Society of Physicians and Naturalists, Iaşi. 2015; 119: 236–242.

[13] Heidari A, Mokhtari S, Hamrah MH, Tavana Z, Heydarigoojani M, Tavana N. Investigating the factors affecting the need for unilateral space maintainer for first primary molars in late mixed dentition. BioMed Research International. 2022; 2022: 7604144.

[14] Park K, Jung DW, Kim JY. Three-dimensional space changes after premature loss of a maxillary primary first molar. International Journal of Paediatric Dentistry. 2009; 19: 383–389.

[15] Petcu A, Maxim A, Haba D. Correlation between the lower first permanent molar axis and the premature loss of temporary molars. Medical-Surgical Journal of the Society of Physicians and Naturalists, Iaşi. 2009; 113: 1253–1257. (In Romanian)

[16] Pokorna H, Marek I, Kucera J, Hanzelka T. Space reduction after premature loss of a second deciduous molar: a retrospective study. IOSR Journal of Dental and Medical Sciences. 2016; 15: 1–8.

[17] García Y, Da Silva L, Medina A, Contreras O. Effect of the premature loss of primary molars over the incisal horizontal relation. Revista De Odontopediatría Latinoamericana. 2011; 1: 49–57. (In Portuguese)

[18] Warkhandkar A, Habib L. Effects of premature primary tooth loss on midline deviation and asymmetric molar relationship in the context of orthodontic treatment. Cureus. 2023; 15: e42442.

[19] Alexander SA, Askari M, Lewis P. The premature loss of primary first molars: space loss to molar occlusal relationships and facial patterns. The Angle Orthodontist. 2015; 85: 218–223.

[20] Alnahwi HH, Donly KJ, Contreras CI. Space loss following premature loss of primary second molars. General Dentistry. 2015; 63: e1–e4.

[21] Bindayel NA. Clinical evaluation of short term space variation following

premature loss of primary second molar, at early permanent dentition stage. Saudi Dental Journal. 2019; 31: 311–315.

[22] Lucas-Rincón SE, Robles-Bermeo NL, Lara-Carrillo E, Scougall-Vilchis RJ, Pontigo-Loyola AP, Rueda-Ibarra V, *et al*. Interproximal caries and premature tooth loss in primary dentition as risk factors for loss of space in the posterior sector: a cross-sectional study. Medicine. 2019; 98: e14875.

[23] Mosharrafian S, Baghalian A, Hamrah MH, Kargar M. Clinical evaluation for space maintainer after unilateral loss of primary first molar in the early mixed dentition stage. International Journal of Dentistry. 2021; 2021: 3967164.

[24] Kaklamanos EG, Lazaridou D, Tsiantou D, Kotsanos N, Athanasiou AE. Dental arch spatial changes after premature loss of first primary molars: a systematic review of controlled studies. Odontology. 2017; 105: 364–374.

[25] Zhao J, Jin H, Li X, Qin X. Dental arch spatial changes after premature loss of first primary molars: a systematic review and meta-analysis of split-mouth studies. BMC Oral Health. 2023; 23: 430.

How to cite this article: Hibeth Félix Fernández, Katherine Jeanette Campos Campos. Clinical consequences of premature loss of primary molars: a narrative literature review. Journal of Clinical Pediatric Dentistry. 2026; 50(6): 1-8. doi: 10.22514/jocpd.2026.139.