Interproximal Carious Lesion Progression in Primary Molars and Canines

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Background

- Intraoral imaging is the standard diagnostic tool for evaluating and monitoring oral diseases
- Timing, type, and frequency of radiographs should be determined by child's history, clinical findings, and susceptibility to oral diseases[2]
- Modern caries management is more conservative, includes early detection, identifying individual risk factors, understanding disease process, and active surveillance[1]
- Treatment decisions should be guided by protocol and clinical judgement, especially when young patients' abilities to tolerate treatment can be unpredictable
- Teeth with carious lesions which did not receive restorative treatment present opportunities to study caries progression trends

Objective

To assess disease progression of interproximal caries in primary molars and canines.

Methods

Retrospective chart review of healthy (ASA I or II) patients seen at Boston Children's Hospital Department of Dentistry between 2016-2024 with at least 3 sets of diagnostic bitewing radiographs with the first set taken between ages 3-5 years.

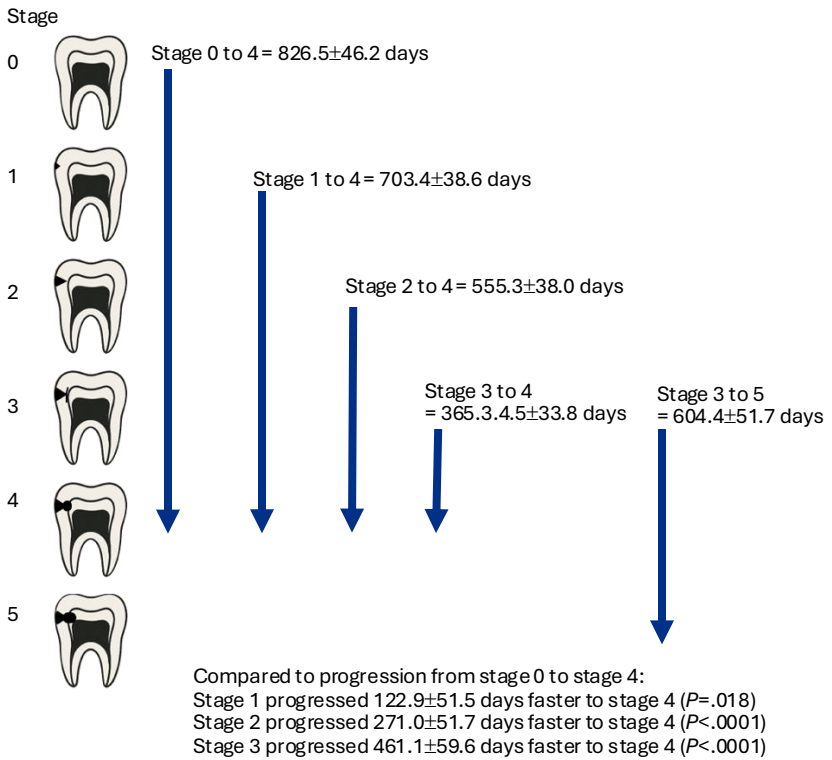
Calibrated examiners independently scored the caries stage of each tooth surface using the Mejare[4] system (k = 0.80). Statistical analysis was performed to evaluate the progression using descriptive analysis (mean±standard deviation) and linear regression.

Caries Staging:

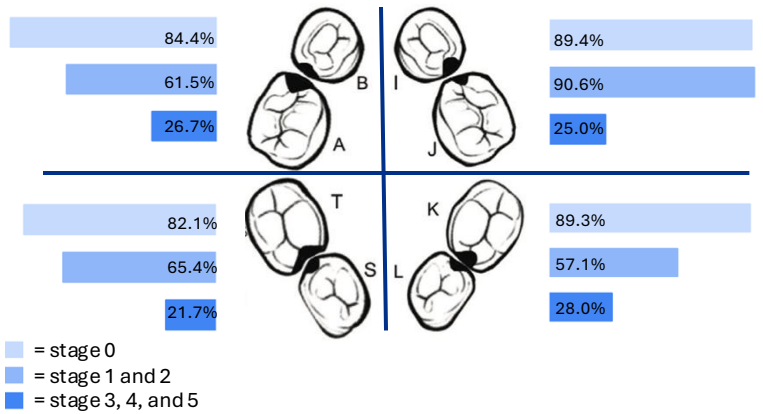
0 = no visible radiolucency
1 = radiolucency in outer half of enamel
2 = radiolucency in inner half of enamel
3 = radiolucency broke enamel-dentin junction (DEJ)
4 = radiolucency with obvious spread in outer half of dentin
5 = radiolucency with obvious spread in inner half of dentin

Results

- Interproximal tooth surfaces (n=2240) were evaluated in 112 patients over a minimum of three timepoints.
- Male: 49.1%; Female: 50.9%
- Average age at T_0 = 4.5 years (range 2.4-6.0 years)



Risk of Similar Caries Staging on Primary 2nd Molar Based on Adjacent 1st Molar Surface Caries Status[3]



Conclusions

- Interproximal caries in primary teeth require ~1.5 and 1 year to reach outer dentin from inner enamel and DEJ respectively
- Lesions require ~7 months to progress from outer to inner dentin
- Interproximal caries status is a predictor for caries presence in adjacent tooth surface
- Frequency of recalls and radiographs should be determined with consideration of interproximal caries presence and status of adjacent tooth surfaces
- Personalized risk-based caries management should be utilized to prevent and slow progression of caries in primary teeth, particularly in pre-cooperative children
- Pre-cooperative children with early interproximal caries may benefit from deferring restorative treatment until more able to tolerate treatment without advanced behaviour guidance.

References

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