

ABSTRACT

Purpose: This study evaluated the clinical and radiographic success of lesion sterilization and tissue repair (LSTR) therapy in primary molars based on the presence or absence of baseline radiographic bony changes (RBC). **Methods:** In this retrospective review 50 LSTR-treated teeth were divided into two groups based on the presence/absence of baseline RBC. Variables extracted from the records included gender, arch, tooth type, and presenting clinical and radiographic signs and symptoms. Clinical and radiographic outcomes, including previously reported adverse events, were evaluated at recall appointments (6-42 months). Groups were evaluated using Student's t-tests and Fisher exact tests ($p < .05$). **Results:** Thirty-seven LSTR-treated teeth with appropriate follow-up data were evaluated, 19 with RBC and 18 without RBC. At baseline, the only difference between the groups was that the teeth in the RBC group were more frequently diagnosed as necrotic ($P=.02$). At 6 months ($n=30$), the non-RBC group showed no significant change in clinical signs, while the RBC group demonstrated fewer clinical symptoms ($P=.04$) and significant radiographic improvement ($P < .001$). At 12 months ($n=16$) radiographic improvement persisted in the RBC group ($P < .001$), with significant intergroup differences ($P=.01$). In the RBC group, 2 treatments failed (10.5%) and 1 showed signs of delayed eruption with ectopic eruption of the succedaneous tooth. No failures or adverse signs were noted in the non-RBC group. **Conclusions:** LSTR demonstrated high clinical and radiographic success irrespective of the presence of initial radiographic bony changes, supporting its use in primary molars regardless of preoperative bony status.

Background:

- The American Academy of Pediatric Dentistry (AAPD) currently recommends **LSTR** for non-vital primary teeth with radiographic bony changes (RBC) and **pulpectomy** for non-vital teeth without RBC.
- These recommendations are based on a conditional recommendation, with **limited and low-quality evidence**.
- 6-month clinical follow-up and a 12-month radiographic follow-up is also recommended for these pulp-treated teeth.

The purpose of this study was to evaluate whether the presence of baseline radiographic bony changes influences the clinical and radiographic success of LSTR in primary molars.

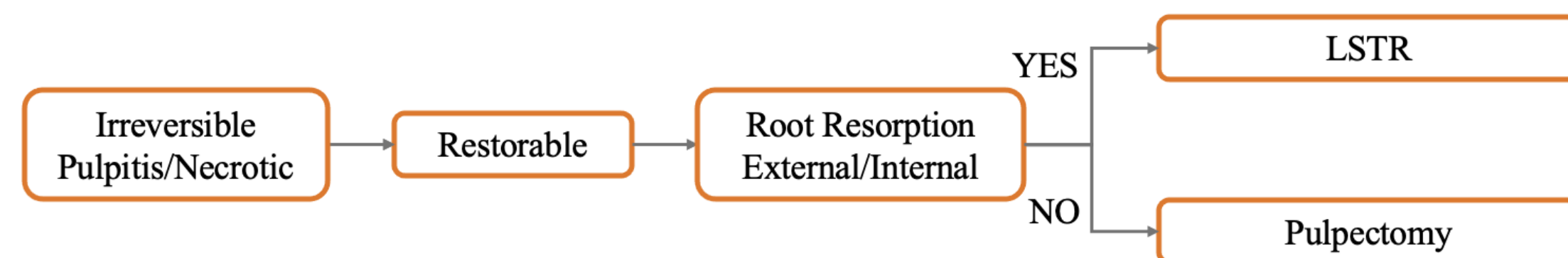


Figure 1. LSTR vs Pulpectomy AAPD Guideline Recommendations

Methods:

- Study approved by UTHealth Houston Institutional Review Board (HSC-DB-22-0693).
- Retrospective chart review of pediatric patients treated at UTHealth Houston Graduate Pediatric Dental Clinic.
- Primary molars diagnosed with irreversible pulpitis, pulpal necrosis, or non-vital pulpal origin were treated with LSTR.
- Teeth were grouped based on presence or absence of baseline radiographic bony changes (PARL/furcation radiolucency).
- Clinical and radiographic signs and symptoms were recorded at pre-operative and recall appointments (6-42 months).
- Outcomes included clinical success/failure, radiographic success/failure, and adverse events (including eruption disturbances).
- Type of tooth loss was documented (natural exfoliation vs extraction due to treatment failure or other causes).
- Statistical analysis performed using Student's t-tests and Fisher's exact tests; significance set at $p < 0.05$.

References:

- American Academy of Pediatric Dentistry. Pulp therapy for primary and immature permanent teeth. The Reference Manual of Pediatric Dentistry. Chicago, IL: American Academy of Pediatric Dentistry; 2025:487-96.
- Coll JA, Vargas K, Marghalani AA, et al. A systematic review and meta-analysis of nonvital pulp therapy for primary teeth. *Pediatr Dent* 2020;42(4):256-72.E11-E199.
- Coll JA, Dhar V, Vargas K, et al. Use of Non-Vital Pulp Therapies in Primary Teeth. *Pediatr Dent* 2020;42(5):337-49.

Results:

- Thirty-seven LSTR-treated primary molars were evaluated (18 non-RBC, 19 RBC).
- At baseline, there were no differences between groups in gender, arch, tooth type, or presenting symptoms ($p > 0.05$).
- The RBC group had a higher proportion of necrotic diagnoses compared to control ($p = 0.02$).
- At 6-month recall ($n = 30$), 13 non-RBC and 17 RBC teeth were evaluated.
 - In the non-RBC group, no statistically significant changes in clinical signs were observed compared to baseline ($p > 0.05$), though clinical improvement was noted.
 - In the RBC group, there were fewer clinical symptoms at 6 months compared to baseline ($p = 0.04$) (Figure 2) and significant radiographic improvement ($p < 0.001$) (Figure 3).
 - When comparing groups at 6 months, there was a significant difference in radiographic findings ($p = 0.0003$), with radiographic healing in the RBC group and self-limiting resorption observed in some non-RBC teeth.
 - At 6 months, overall success rates were 100% for non-RBC and 94% for RBC-treated teeth.
- At 12-month recall ($n = 16$), 7 non-RBC and 9 RBC teeth were evaluated.
 - In the control group, no statistically significant differences in clinical signs were observed compared to baseline ($p > 0.05$) (Figure 2), though improvement was noted.
 - In the RBC group, there was a trend toward fewer clinical symptoms ($p = 0.06$) (Figure 3) and significant radiographic improvement ($p = 0.0002$).
 - When comparing groups at 12 months, there was a significant difference in radiographic findings ($p = 0.01$), with continued improvement in the RBC group.
 - At 12 months, overall success rates were 100% for non-RBC and 95% for RBC-treated teeth.
- In the RBC group, 2 failures (10.5%) were observed and 1 case demonstrated delayed eruption with ectopic eruption of the succedaneous tooth. No failures or adverse events were observed in the control group.

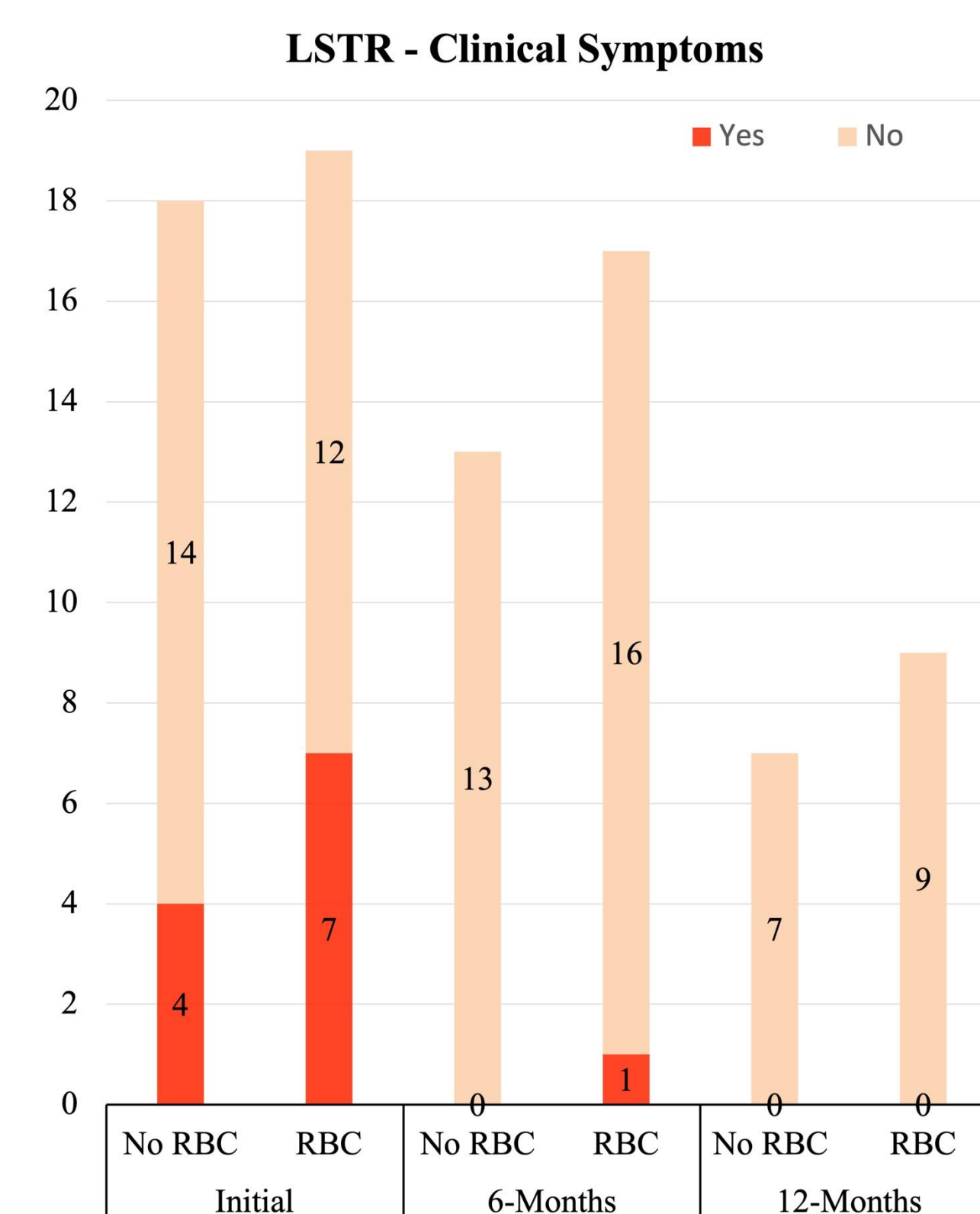


Figure 2.

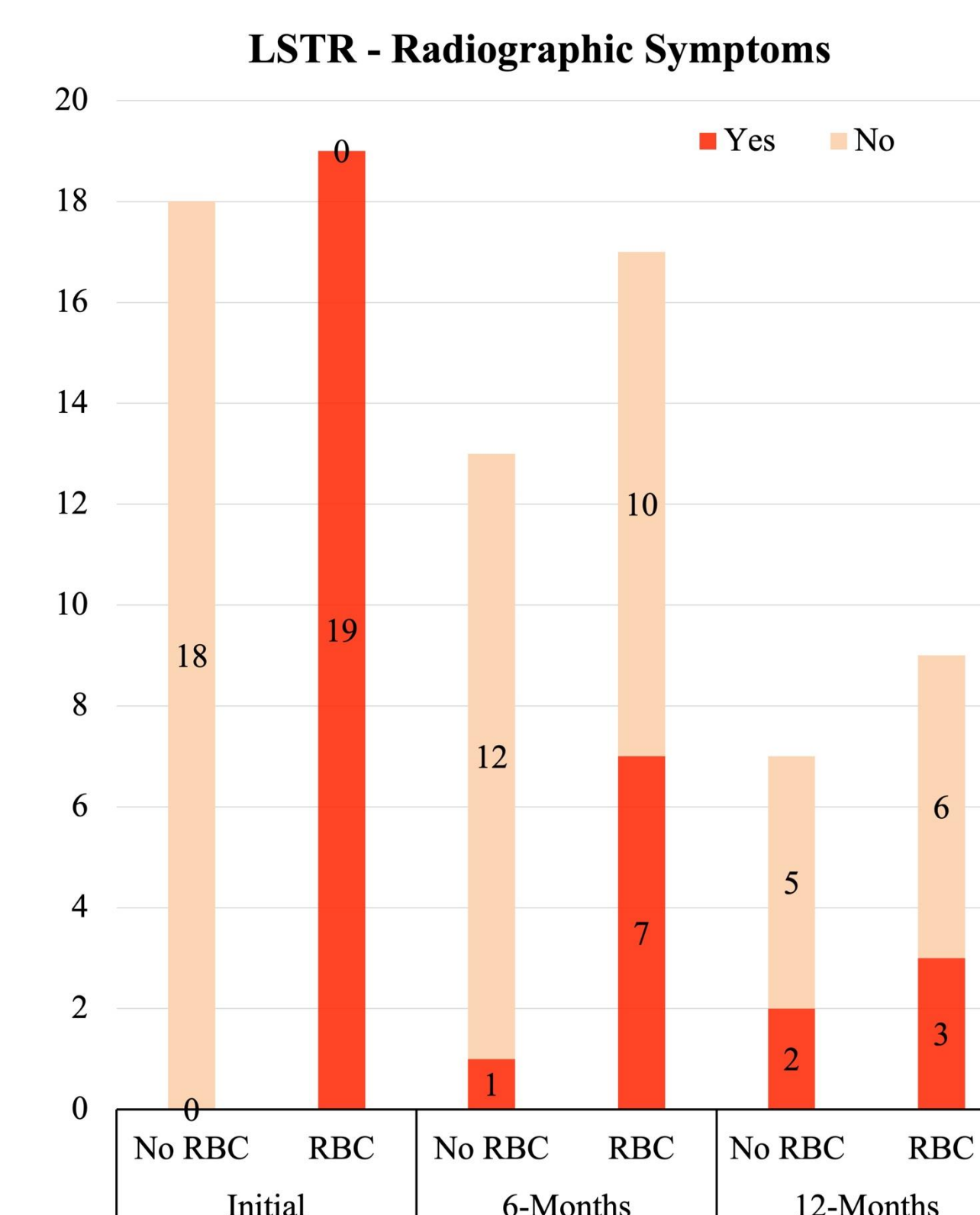


Figure 3.

Discussion:

In this study, LSTR demonstrated high clinical and radiographic success regardless of the presence of baseline radiographic bony changes, with outcomes comparable between groups despite greater disease severity in the RBC group.

- LSTR-treated teeth with baseline radiographic bony changes showed **significant radiographic healing** and improvement in clinical symptoms over time.
- LSTR-treated teeth without baseline radiographic bony changes demonstrated **similar overall success rates**, though some cases exhibited self-limiting resorption.
- At both 6- and 12-month follow-up, **no significant differences in overall success rates** were observed between groups.
- These findings suggest that **LSTR success is not dependent on preoperative radiographic status**.
- Current American Academy of Pediatric Dentistry recommendations favor different treatment approaches based on presence of radiographic bony changes; however, these guidelines are based on **limited evidence**.

The results of this study support expanding the indication for LSTR in non-vital primary molars regardless of initial radiographic presentation.

Limitations:

- Retrospective study design
- Small sample size, particularly at 12-month follow-up
- Variable follow-up intervals and incomplete long-term data

Further Research should include larger, prospective designs with standardized follow-up to evaluate long-term outcomes of LSTR. Investigation beyond 12 months is needed. Exploring LSTR use in vital primary molars may expand its clinical applications.

Acknowledgements:

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