

## ABSTRACT

**Purpose:** The purpose of this retrospective study was to compare the clinical and radiographic effectiveness of non-vital and irreversible pulpal therapy. The study compared LSTR and pulpectomy treatment completed in children in Houston, TX.

**Methods:** Children, three to ten years old, with at least one primary molar diagnosed with pulpal necrosis or irreversible pulpitis, were included in this study. Teeth were either treated via LSTR or pulpectomy. Patients were followed up at each recall and symptoms of treated teeth were monitored. The molars were followed until exfoliation, or extraction occurred.

**Results:** Fifteen children (Age-Mean(SD)=6.3(1.19), Male=53.3%), twenty-two primary molars (first primary molars=36.3%, maxillary=36.3%) were treated with LSTR. Sufficient follow up for nineteen primary molars available. Twenty-three primary molars (maxillary=82.6%, first primary molar=4.2%) were treated with pulpectomy with sufficient follow up. There was no statistical difference between males versus females, maxillary versus mandibular teeth, or diagnosis ( $p < 0.05$ ). First molars were treated more with LSTR than pulpectomy (LSTR=7, pulpectomy=1,  $p=0.013$ ). Pulpectomy treated teeth presented with more symptoms initially, including palpation sensitivity ( $p=0.03$ ). At 6 months, pulpectomy had a higher failure rate than LSTR (5.26% versus 25%,  $p=0.18$ ). LSTR treated teeth had a better overall improvement of symptoms compared to pulpectomy (73.68% versus 35%,  $p=0.08$ ).

**Conclusions:** At the initial six-month recall, primary teeth treated with LSTR appear to have a better success rate than primary teeth treated with pulpectomies. LSTR teeth are continuing to be monitored for symptoms and failures. It is hypothesized that LSTR will have a greater success rate at one year.

## BACKGROUND

- Both LSTR treatment and pulpectomy are recognized by the AAPD as treatment for non-vital primary molars
- Current clinical recommendation for LSTR medicament is ciprofloxacin, metronidazole, minocycline, in a 1:1:1 ratio dissolved in either propylene glycol or macrogol.
- Limited studies are present on the success of LSTR treatment (Figure 1).

Author	Sample Size	Antibiotics Used	Radiographic Success	Clinical Success
Nakomchai et al	25	3Mix-MP (1:1:1 Ratio)	76% at twelve months	100% at twelve months
Chakraborty et al	3	3Mix-MP (3:1:3 Ratio)	100% at six months	100% at six months
Jaya et al	30	3Mix-MP (3:1:3 Ratio)	100% at twelve months	100% at twelve months

3Mix-MP: Metronidazole, Ciprofloxacin, Minocycline

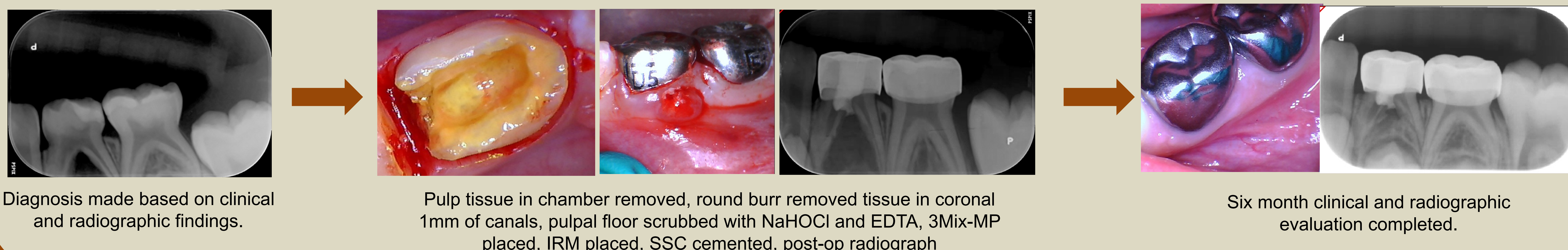
Figure 1. Recent studies on efficacy of LSTR treatment in primary molars.

- The goal of this project is to compare the six-month clinical and radiographic effectiveness of pulpectomy and LSTR treatment on primary molars.**

## METHODS

- This study was approved by the UTHealth Houston Institutional Review Board.
- Pediatric dental patients that were included in this study were compiled from charts of children seen in the UTHealth Post-Graduate Dental Clinic.
- Patients included in this study had been diagnosed with irreversible pulpitis or pulpal necrosis in a primary molar. These molars were treated with non-vital pulpal therapy according to standard procedure (see LSTR flowchart). Signs and symptoms were recorded at pre-op and post-op appointments.
- Any further treatment was noted to record failure. Failure of treatment was determined by the completion of the simple extraction of exposed tooth code (D7140).
- Statistical analysis completed to compare the two study groups. P-values  $< 0.05$  considered significant.

## LSTR FLOWCHART



## RESULTS

- Twenty three pulpectomy-treated teeth and 19 LSTR-treated teeth were evaluated.
- Table 1 compares clinical and radiographic findings of all teeth included in this study.
- There was no difference in individual symptoms for either group at either initial visit or six month evaluation ( $p > 0.05$ ).
  - At initial visit, there was a TREND of positive palpation findings were more often observed in pulpectomy-treated teeth ( $p=0.09$ )
  - At 6 month evaluation, there was a TREND of positive percussion ( $p=0.09$ ), palpation ( $p=0.09$ ), and furcation radiolucency ( $p=0.08$ ) observed in pulpectomy-treated teeth.
- For LSTR-treated teeth, 68.4% had an improvement of symptoms, 26.3% had no change, and 5% worsened. When compared to pulpectomy-treated teeth, which 35% had an improvement of symptoms, 40% had no change, and 25% worsened, there was a TREND towards statistical difference between treatment groups ( $p=0.08$ ).
- By the 6 month evaluation, there was no difference in failure rate between LSTR-treated teeth and pulpectomy-treated teeth (5.26% vs. 25%;  $p=0.18$ ).

Treatment Option	Number	First Molar	Gender	Initial Visit						6 Month Evaluation	
				Percussion	Palpation	Fistula	Swelling	Mobility	Furcal RL	Absence of Symptoms	Fail
Pulpectomy	23	4.20%	34.7% Male	26.1%	26.1%	13.0%	17.4%	30.4%	47.8%	35.0%	25.0%
3Mix-MP LSTR	19	36.30%	53.3% Male	21.0%	5.26%	5.26%	5.26%	42.1%	63.2%	73.7%	5.26%

Table 1. Clinical and radiographic findings of teeth included in study

## DISCUSSION

- In this study, there is a trend for LSTR to be more successful than pulpectomy treatment at the first six month recall post treatment completion.**
  - LSTR has a trend to have better bone regeneration in furcal area than pulpectomy at the six month recall following treatment completion.
  - LSTR has a similar six-month success rate as pulpectomy therapy in primary molars.
- The results of this current study **support the recommendations of the AAPD** for treatment recommendations for primary molars that are diagnosed with irreversible pulpitis, or deemed necrotic.

### Limitations:

- Small sample size, similar to other peer reviewed studies
- Adequate data at this time is only available for six months. Additional research is needed to further assess longevity of treatment of LSTR.

**Further research** should focus on the continued longevity of LSTR treatment versus pulpectomy. Additional information regarding time until exfoliation and speed of physiologic resorption can provide vital information on success in regard to space maintenance.

## ACKNOWLEDGEMENTS

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