ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2022; 8(3): 118-123

www.oraljournal.com
Received: 18-05-2022
Accepted: 21-06-2022

Dr. Aniket Desai
Assistant Professor, Sinhgad Dental College and Hospital, Department of Pediatric and Preventive Dentistry, Vadgaon BK Pune, Maharashtra, India

Dr. Prasad Jathar
Associate Professor, Sinhgad Dental College and Hospital, Department of Pediatric and Preventive Dentistry, Vadgaon BK Pune, Maharashtra, India

Dr. Sujay Kulkarni
Consultant Oral and Maxillofacial Surgery, Kothrud, Pune, Maharashtra, India

Dr. Amey Panse
Associate Professor, Sinhgad Dental College and Hospital, Department of Pediatric and Preventive Dentistry, Vadgaon BK, Pune, Maharashtra, India

Dr. Bhagyashree Salunkhe
Associate Professor, Sinhgad Dental College and Hospital, Department of Pediatric and Preventive Dentistry, Vadgaon BK, Pune, Maharashtra, India

Dr. Madhura Jathar
Assistant Professor, Sinhgad Dental College and Hospital, Department of Oral Medicine and Radiology, Vadgaon BK Pune, Maharashtra, India

Corresponding Author:
Dr. Aniket Desai
Assistant Professor, Sinhgad Dental College and Hospital, Department of Pediatric and Preventive Dentistry, Vadgaon BK, Pune, Maharashtra, India

Treatment of pulpally involved primary molars utilizing LSTR: Report of two cases

Dr. Aniket Desai, Dr. Prasad Jathar, Dr. Sujay Kulkarni, Dr. Amey Panse, Dr. Bhagyashree Salunkhe and Dr. Madhura Jathar

DOI: https://doi.org/10.22271/oral.2022.v8.i3b.1595

Abstract
The purpose of this report was to review an emerging alternative treatment to pulpectomies and extractions for nonvital primary teeth called lesion sterilization and tissue repair (LSTR) and provide the results of two clinical case reports. LSTR is a noninstrumentotion endodont treatment (NIET) that involves a triple antibiotic mixture in a suitable vehicle, which is used to disinfect root canol systems. This type of treatment is develop by the coriology research unit of the School of Dentistry. Niigata University. Japan. This article describes clinical procedures required for the technique, two clinical applications and radiographic documentation and follow-up.

Keywords: NIET, LSTR, triple antibiotic mixture, primary teeth

Introduction
Treatment of pulpally involved primary teeth is one of the important and critical task in pediatric dentistry. Traditionally accepted treatment options for teeth with infected root canals/periradicular tissues are pulpectomy or extraction [1]. Although extraction with space maimenance remains a viable treatment option, a successfully restored primary tooth is a far superior space maintainer than an appliance [2, 3].
Though the pulpectomy is batter option for pulpally involved teeth but the technique is challenging sometime because of various reasons. This includes continuous changes in the apical foramen as a result of physiologic and pathologic resorption unable to provide sufficient apical seal, over instrumentation may injure the developing permanent tooth bud, apparent connection between the coronal floor with the intraradicular area with the presence of multiple accessory canals and ramifications leads to complete extirpation of pulp almost impossible [4-6].
The cariology research unit of the School of Dentistry, Niigata University, Niigata, Niigata Prefecture, Japan, developed the concept of lesion sterilization and tissue repair (LSTR) therapy, which is a non-instrumentation endodontic treatment that employs a mixture of antibacterial drugs in a propylene glycol vehicle for the disinfection of dentinal, pulpal and periapical lesions. Basically it works on principle that if lesions are completely disinfected, tissue repair can be expected [8].
This article presents two case reports in which LSTR technique was utilized in primary teeth to maintain arch integrity. In present cases Minocycline, Ofloxacin and Metronidazole tablets were crushed and mixed in 1:1:1 ratio with propylene glycol. A thick creamy mixture was used as medicament and placed in pulpal chamber.

Case Reports
Case 1
A five and half-year-old male child reported to the department of pediatric and preventive dentistry with chief complaint of toothache on the lower right side since 4 week. The patient reported spontaneous pain and aggravating with eating and drinking. No significant medical or family history was reported, and he otherwise appeared healthy. On intraoral examination it was seen that both 84 and 85 were grossly decayed and loaded with plaque and food debris. (Fig 1) Radiographic examination revealed the occlusal caries extending in to pulpal chamber

and considerable furcation involvement with respect to 84 and 85. (Fig 2) Step-wise treatment was carried out as mentioned herewith: after RCO, debridement was done with the help of curette and sterile cotton pellet.

Copious irrigation was done with plain saline, no endodontic instrumentation was carried out. After sufficient debridement the chamber was dried with cotton and the clinical procedure of LSTR using triple antibiotic paste was completed under good isolation. (Fig 3) Restoration was done with GIC. After that permanent restoration was done by placing the stainless-steel crowns on 84 and 85. At the one-, two- and three-months follow-up appointments, no symptoms were reported. No any soft tissue changes like abscess, sinus in buccal vestibule or mobility were seen with 84 and 85. (Fig 4, 5).

Fig 1: Preoperative Extensive caries seen with 84 and 85

Fig 2: Preoperative furcation status of 84 and 85

Fig 3: Intra operative after placement of Triple antibiotic paste (TAP)

Fig 4: Final restoration of 84, 85 with SSC

Fig 5: Follow up IOPA after 3 months

Fig 6: Preoperative of 85

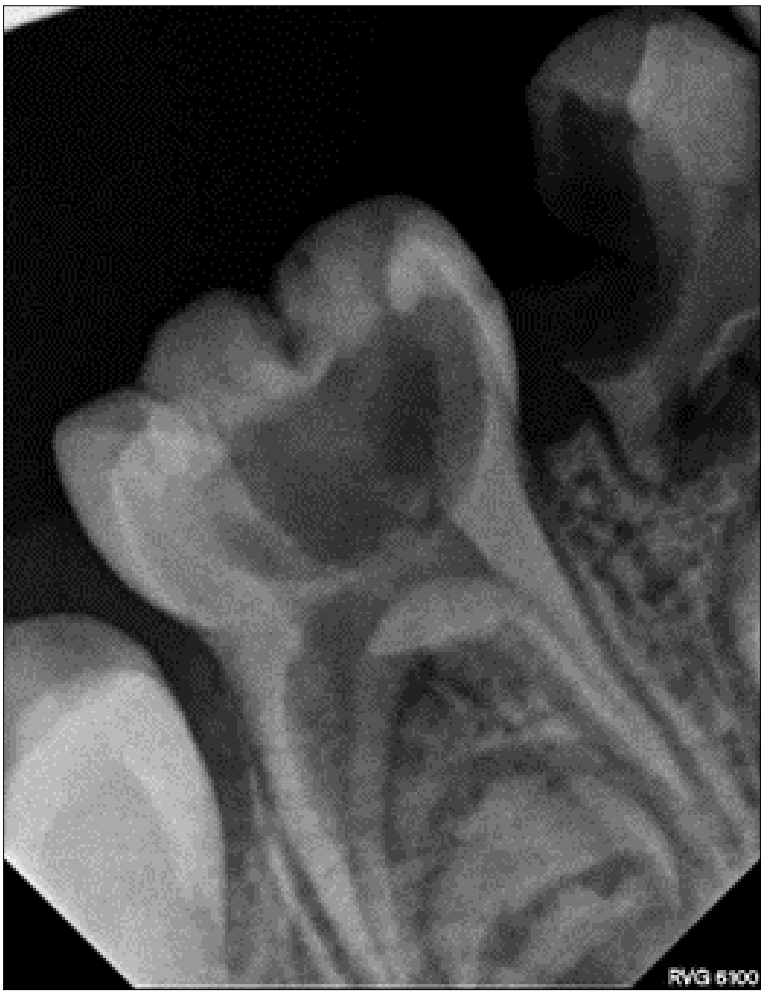

Fig 7: Preoperative furcation status of 85

Fig 8: Intra operative photo after placement of TAP

Fig 9: Post operative iopa of 85, follow up after 3 months

Case 2

A five-year-old male child reported to the department of pediatric and preventive dentistry with chief complaint of toothache on the lower left side since 2 week. The patient was experiencing pain in spontaneous, dull aching and intermittent in nature and aggravating with eating and drinking. No significant medical or family history was reported, and he otherwise appeared healthy.

On intra oral examination occluso lingual caries was present and complete structural loss of lingual wall of 85 was seen. (Fig 6) Radiographic examination reviled that occlusal caries extending in to pulpal chamber and internal root resorption seen just below the cervical portion in mesial canal. (Fig 7) Step-wise treatment was carried out as mentioned herewith: only superficial debridement was done with the help of curette and sterile cotton pellet. Science the pulpal tissue was hyperemic and bleeding easily. Hemostasis was achieved by applying cotton pellet loaded with 5% NaOCl. Copious irrigation was done with plain saline no endodontic instrumentation was carried out. After chamber was dried with cotton and the clinical procedure of LSTR using triple antibiotic paste was completed under good isolation. (Fig 8) Restoration was done with GIC. Permanent restoration was done by placing the stainless-steel crowns on 85. At the one-, two- and three-month follow-up appointments, no symptoms were reported. No any soft tissue changes like abscess, sinus in buccal vestibule or mobility seen with 85. (Fig 9)

Discussion

Maintaining the integrity and health of oral tissues is the important objective of pulp treatment in primary dentition. Conservative treatments are recommended for primary teeth whose pulps have the potential to recover once the irritation is removed.

Various techniques have been described for conserving primary molars whose pulps have become non-vital or have degenerated to the extent that they are not good candidates for vital pulp therapy. Most of these techniques can be assigned to one of two major classifications.one is removing the contents of pulp chamber and placing some sort of medication over the radicular pulp stump for a varying period of time. Second one includes removing all accessible pulp tissue and restoring the canals with an absorbable filling material. In present cases first approach was advocated [9].

In both cases above mentioned the first permanent molar was not erupted and because of various controversial reasons distal shoe space maintainer was not good option. Additionally in both cases the 84 was unable to provide firm abutment for distal shoe. In such cases taking support of canine can be considered but increasing length of horizontal arm of distal shoe may lead to compromised stability and possibly make the appliance traumatic.

Especially in such cases where the tooth is strategically important like pulpal or some furcal involvement of second deciduous molar before erruption of first permanent molar LSTR could be a best option. Additionally, because of behavioral problems performing LSTR in such patients can be better than performing conventional pulpectomy.

Takushige *et al*. clinically applied this LSTR theory in 87 infected primary molars. 54 of the infected primary molars showed radiolucencies on radiographs, 52 had gingival swellings and 22 had fistulas. Their results showed that 83 of the 87 cases demonstrated healing after one application of the 3-Mix-M Dental Paste. In those 83 cases, pain, swelling, and fistulas resolved within one week of therapy. The four nonresponding teeth were retreated due to continued swelling, and, consequently, all symptoms resolved. Success was described as follows: no mobility, functional tooth, and no pain or infection. And concluded that primary teeth with periradicular lesion were treated successfully with LSTR technique [8].

David Burrus *et al*. reported series of three successfully treated pulpally involved primary teeth with LSTR technique [10].

Chutima Trairatvorakul and Palinee Detsomboonrat evaluated success rates of a mixture of ciprofloxacin, metronidazole, and minocycline antibiotics used in the non-instrumentation endodontic treatment of mandibular primary molars with carious pulpal involvement and concluded that non-instrumentation endodontic treatment using 3Mix-MP showed good clinical success but had a low success rate based on radiographic evaluation at 2-year follow-up. Hence, 3Mix antibiotic treatment cannot replace a conventional root canal treatment agent as a long-term therapy [11].

Given the positive results of the three completed cases, further controlled clinical trials are warranted with long-term follow-up to assess the exfoliation of the treated teeth and to determine the implications, if any to the succedaneous teeth. Additionally, for LSTR to become a reliable treatment option, the selection criteria and protocol need to be continually redefined and updated to yield the best predictable outcomes.

References

1. McDonald RE, Avery DR, Dean JA. Treatment of deep caries, vital pulp exposure, and pulpless teeth. In:' McDonald RE, Avery DR, eds. Dentistry for the Child and Adolescent. 8" ed. Philadelphia, Pa: CV Mosby Co, 2004, 388-4 12.
2. American Academy of Pediatric Dentistry. Guideline on management of developing dentition and occlusion in pediatric dentistry. Pediatr Dent. 2012;34:239-51.
3. Belanger G. Pulp therapy for the primary dentition. Pediatr Dent. 1988;10:257-67.
4. Holan G, Fucks AB. A comparison of pulpectomies using ZOE and KRI paste in primary molars: A retrospective study. Pediatric Dentistry. 1993;15:403-07.
5. Moss SJ, Addelston R, Goldsmith ED. Histologic study of pulpal floors of deciduous molars. JADA 1965;70:372.
6. Mathewson RJ, Primoch RE, Morrison JT. Fundamentals of pediatric dentistry (3rd ed). Quintessence Publishing Co Inc, 1995, 257-84.
7. Takushige T, Cruz E, Moral A, Hoshino E. Endodontic Trearment of primary teeth using a combination of antibacterial drugs. Endod J. 2004;37:132-8.
8. Agarwal M, Das UM, Vishwanath D. A comparative evaluation of non-instrumenration endodontic techniques with conventional ZOE pulpectomy in deciduous molars: an *in vivo* study. World J Dent. 2011;2:187-92.
9. Burrus D, Barbeau L, Hodgson B. Treatment of abscessed primary molars utilizing lesion sterilization and tissue repair: literature review and report of three cases. Pediatr Dent. 2014;36(3):240-4.
10. Trairatvorakul C, Detsomboonrat P. Success rates of mixture of ciprofloxacin, metronidazole, and minocycline antibiotics used in the non-instrumentation endodontic treatment of mandibular primary molars with carious pulp involvement. Int J Paediarr Dent. 2012;22(2):17-27.