

Non extraction Management of primary tooth furcation using Lesion Sterilisation and Tissue Repair Therapy – A Case Report

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Abstract

Lesion sterilization and tissue repair (LSTR) therapy is an endodontic treatment procedure that involves non – instrumentation or minimal instrumentation followed by placement of antibiotic mixture to disinfect root canal systems. The purpose of this report was to highlight a case in which LSTR was successfully attempted in primary mandibular second molar exhibiting furcation involvement with internal root resorption using triple

antibiotic paste as an alternative treatment option to extraction followed by space maintainer.

Keywords: internal resorption, deciduous teeth, Lesion sterilization, tissue repair, triple antibiotic

Introduction

Premature loss of primary teeth can lead to various problems such as ectopic eruption, disturbed eruption sequence, drifting of erupted teeth, development of abnormal habits like tongue thrusting, alteration in speech, function and space loss for permanent successor

teeth (Camp 1994) . Therefore primary teeth should be conserved to maintain arch integrity . An intact successfully disinfected , conserved natural teeth is considered as best space maintainer.²

Teeth with infected root canals, periradicular pathosis ,abcess, irreversible pulpitis are often managed by pediatric dentist with traditionally accepted treatment options like pulpectomy or extraction.⁴ However residual microbial colony has always been an area of penumbra for practicing dentist. ⁵ Sterilization of root canals and periradicular tissues removes bacteria, their by products and their substrates by destroying ecosystem of microbes through chemical and mechanical methods.

Besides the use of nonspecific antiseptics, Cariology research unit, school of dentistry , Niigata university , Japan , 2004 have developed a concept of Lesion sterilization and tissue repair that employed a mixture of antibacterial drugs (metrinadazole, ciprofloxacin and minocycline) for disinfection of dentinal, pulpal and periradicular lesions. Repair of damaged tissue can be expected if lesions are successfully disinfected.³⁻

⁵Preparation of the triple antibiotic mixture:

Commercially available ciprofloxacin (200 mg), metronidazole (400 mg), and minocycline (100 mg) were used. The preparation was done similar to the procedure mentioned by Takushige *et al.* ¹ The enteric coating was removed and the drugs were pulverized and kept separately in airtight containers. The powdered drugs were mixed in a ratio of 1:3:3. The drug mixture was then mixed with propylene glycol or canal sealer, producing a paste-like consistency.

Case Report

A 5 year male patient reported to outpatient department with chief complaint of pain in lower left back tooth region since two weeks. Pain was sharp, continuous, aggravated on mastication and was relieved on taking

medication. Past dental history revealed that patient had undergone treatment of the same tooth 3 months back . Medical history was not significant. Intraoral examination revealed grossly decayed mandibular second primary molars. The tooth was tender on percussion with grade 2 mobility.

Intraoral periapical radiograph revealed furcation involvement, radiolucency circumscribing mesial internal root resorption of alveolar bone and external root resorption of the distal root was seen .Lesion sterilization therapy was planned instead of extraction as the patient was only 5 years old. A written informed consent was obtained from parents after explaining the procedure and prognosis clearly to the parents and preoperative photographs were taken .

On excavation of the carious lesion with spoon excavator glass ionomer restoration was found in the pulp chamber which was removed. Cavity was prepared depending on the extent of the lesion. The carious dentin was excavated with spoon excavator and with a large round bur at slow speed. Access cavity was prepared and coronal pulp tissue was extirpated under local anaesthesia. Haemorrhage was controlled by applying cotton pellet and irrigation was done using normal saline. Triple antibiotic paste was placed in the pulp chamber and the coronal seal was provided with glass ionomer cement.

The procedure was completed in single visit. Immediate follow up was done after 15 days and patient was completely relieved of pain and other symptoms. Stainless steel crown was then given and patient was recalled after one month, 3 months and 6 months for follow up. Radiograph at the 1-month, 3-month and 6 month follow-up visit revealed reversal of internal resorption in the distal root and reduced furcal and periradicular radiolucency.

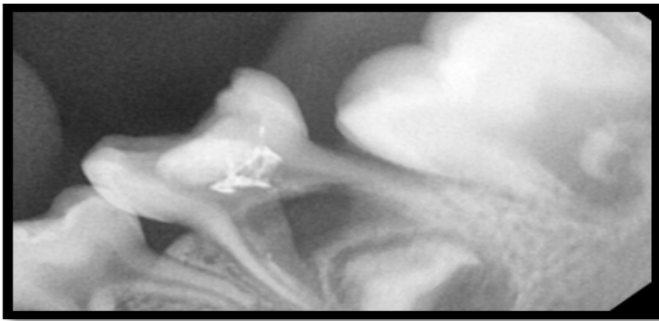


Fig. 1 Preoperative radiograph

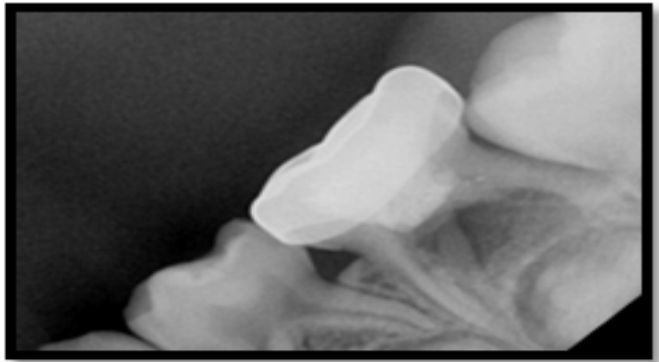


Fig 2. Follow up after 1 month

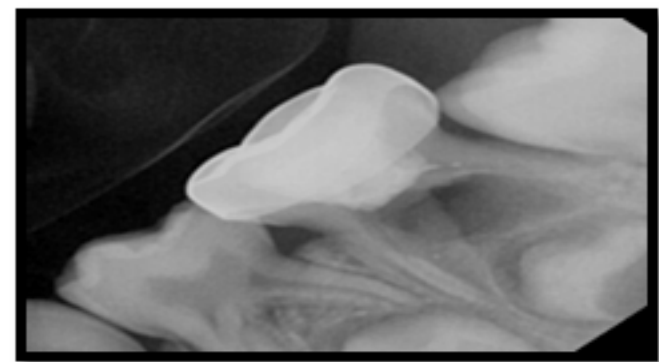


Fig 3. Follow up after 3 months

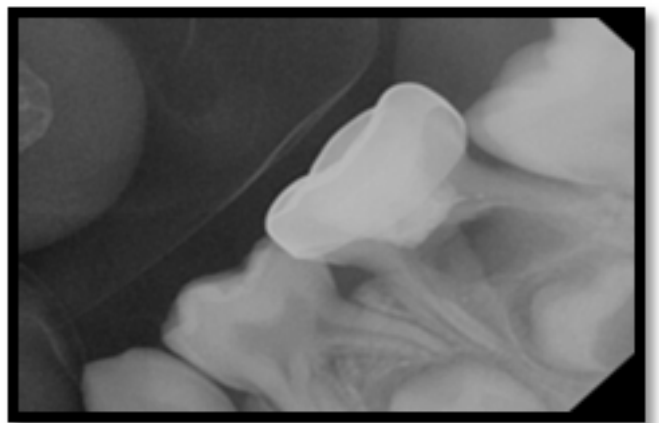


Fig 4 Follow up after 6 months

The result of the LSTR therapy carried out in the above case appear to encourage and support the clinical findings of other studies^[1,4,5] The LSTR therapy can be used as an excellent alternative to extractions and pulpectomies for nonvital primary teeth. However, drug history forms an important part in this regard. LSTR should be avoided if a history of allergy to any of the antibiotics is reported by the patient^[4] In the present case, the patients had a noncontributory medical history and no side effects were encountered on topical application of the triple antibiotic paste.

The success of the present case could be attributed to the bactericidal efficacy provided by the triple antibiotic mixture. The drug combination comprises a nitroimidazole compound that is metronidazole which is effective against anaerobes and protozoa. Ciprofloxacin is a synthetic fluoroquinolone and bactericidal to Gram-negative organisms. Minocycline, a semisynthetic derivative of tetracycline, exhibits a broad-spectrum activity and is effective against both Gram-positive and Gram-negative organisms^[3]

. This case report highlights the success of LSTR therapy on primary teeth where reversal of internal resorption was evident in the radiographic examination in the follow-up visits. Tetracycline causes inhibition of collagenases and matrix metalloproteinases^[6] and increase in the level of interleukin-10, which is an anti-inflammatory cytokine^[7] In addition, it has been proved that metronidazole and ciprofloxacin can generate fibroblasts. Chmilewsky et al^{'s}^[8] study revealed fibroblasts of the human pulp as the first nonimmune cell type capable of producing all complement proteins. These fibroblast cells play a vital role in tissue regeneration by involving pulp progenitors via complement activation, which throws light on the probable reparative procedure of targeting pulp fibroblasts in dentin-pulp regeneration. Therefore, the triple

antibiotic paste has been proved to be biocompatible can be used in primary teeth exhibiting internal resorption.

Conclusion

The future of LSTR therapy in pediatric dentistry seems to be optimistic. In young anxious and uncooperative children, extraction can be avoided and LSTR therapy can be selected as a valuable alternative thereby making the dental treatment non traumatic. Future research involving long-term follow-up is warranted in this regard. But certainly, LSTR has proven to be a promising therapy in the treatment of primary molars exhibiting gross periradicular pathosis and internal resorption.

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