

# LSTR and Dentigerous Cyst Formation: A Case Report

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## INTRODUCTION

Lesion sterilization and tissue repair (LSTR) is a non-vital pulp therapy technique involving an antibiotic paste (traditionally minocycline, metronidazole, and ciprofloxacin) to reduce the pulpal bacterial load without mechanical instrumentation. Although LSTR, compared to pulpectomy, is simpler, faster and recommended in teeth with root resorption, there are associated adverse outcomes. Negative sequelae after LSTR include abnormal exfoliation of primary teeth, interradicular bone loss and one case of an odontogenic keratocyst. Another three cases showed findings of internal resorption which was attributed to the body's response to chronic inflammatory conditions.<sup>3</sup> This case report discusses a 5-year-10-month-old female patient and the potential adverse outcome of a dentigerous cyst (DC) developing post-LSTR treatment.

## ETIOLOGY AND EPIDEMIOLOGY

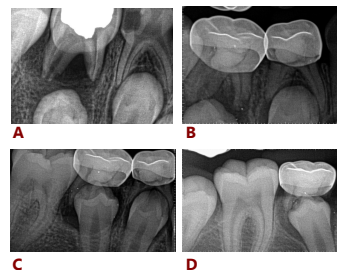
DCs are one of the most common odontogenic cyst (20.6%), and envelop the crown of unerupted teeth.<sup>5</sup> They occur from the accumulation of fluid between the reduced enamel epithelium and enamel or between the enamel organ layers. DCs can be developmental or inflammatory in origin, the latter associated with inflammation from non-vital carious or heavily restored deciduous teeth.<sup>2</sup> The inflammatory DC is characterized by the presence of hyperplastic epithelium with an inflammatory cellular infiltrate because of periapical inflammation from an overlying primary tooth.<sup>7</sup> The location of the cyst in the present case study is consistent with the literature as DCs are most frequently observed in the mandible (70%), and the majority involve the third molars, followed by the maxillary canines and second premolars. Moreover, inflammatory DCs are usually found in mixed dentition in the first decade of life.<sup>2</sup>

## DIAGNOSIS AND MANAGEMENT

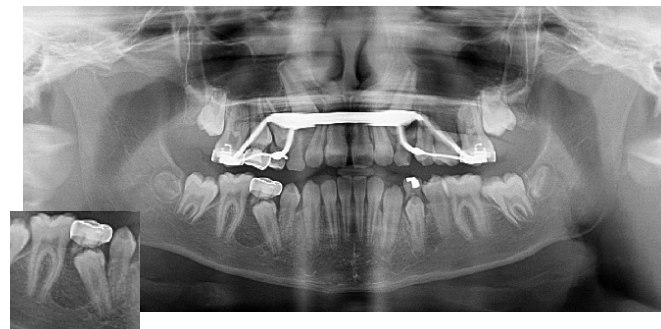
DC's radiographic presentation is a well-defined, unilocular, radiolucency near the crown of an unerupted tooth. They can be expansile and displace teeth, cause root resorption, and are usually asymptomatic unless infected. They are common odontogenic cysts in children where growth may be rapid and may involve primary or supernumerary teeth. Treatment is through enucleation, or marsupialization for larger cysts, and they rarely recur. Previous studies with dentigerous cysts following pulpotomy had outcomes of bone loss, permanent tooth loss or necessitated treatment either with enucleation, marsupialization, or orthodontic treatment.<sup>6</sup> This degree of morbidity suggests the need to emphasize the possible adverse effects of dentigerous cysts with LSTR treatment and the importance of close follow up.

## CASE REPORT

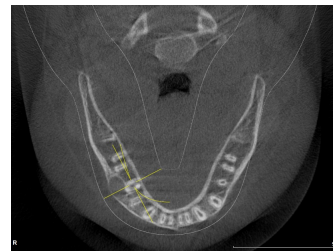
A 5-year-10-month old healthy female patient was referred to the USC Pediatric Dental Clinic for comprehensive dental treatment. Several caries were present, notably with a previous amalgam filling, recurrent decay and abscess on #T and large distal decay on #S (Figure 1A). Lesion sterilization tissue repair (LSTR) was performed on teeth #S and #T utilizing a triple antibiotic paste of metronidazole, ciprofloxacin and minocycline (Figure 1B). Three years following LSTR treatment an asymptomatic unilocular, well-defined radiolucent lesion was identified between the root of #29 and #30 (Figure 2). The 10X5X5mm lesion was removed by oral surgery through excisional biopsy almost 4 years after initial LSTR treatment (Figure 3). Histologically the specimen was identified as a DC, consisting of a cyst partially lined by a thin, hyperplastic stratified squamous epithelium consistent with varying amounts of chronic inflammation.



**Figure 1:** A) Periapical radiograph presented at initial visit, B) Periapical radiograph 12 months after LSTR, C) Periapical radiograph 3 years after LSTR, D) Periapical radiograph 4 years after LSTR, 1 month prior to removal of the DC.



**Figure 2:** Panoramic radiograph 4 years after LSTR, 3 months prior to removal of DC. Inset: Magnification of the DC between #30 and #29



**Figure 3:** CBCT image 1 week prior to removal of the DC.

## DENTAL IMPLICATIONS

Successful use of LSTR in primary teeth with root resorption for up to 12 months has been reported in the literature. Other studies showed 24-month LSTR success of 37% and Grewal et al. showed adverse effects on erupting successors after LSTR treatment, such as interradicular bone loss at 36 months.<sup>3,4</sup> If retained for longer than one year, these teeth should be monitored regularly both clinically and radiographically. Conversely, Takushige et al. performed LSTR in 87 primary molars, some with radiolucencies on radiographs, gingival swelling, and/or fistulas.<sup>10</sup> Their results showed disappearance of clinical symptoms in 83 of 87 of the teeth after a mean observation period of 680 days.

Concerns regarding the triple antibiotic paste include tooth discoloration, allergic reaction, hollow-tube effect, antibiotic-resistant bacterial strains, drug side effects, risk of developmental anomalies in permanent teeth when used in primary teeth, and cyst formation in the presence of chronic inflammation.<sup>8</sup> To our knowledge, only one report has found that LSTR caused an odontogenic keratocyst at 36 months post-treatment in a single case.<sup>4</sup>

## CONCLUSION

This case study represents a rare complication of LSTR treated primary teeth and emphasizes the importance of careful review of radiographs and case selection suitable for LSTR. More research is necessary to determine if DCs are a possible negative sequela from LSTR. Our recommendation is for regular monitoring and recalls on teeth treated with this procedure to rule out any pathology.

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