

## Prosthetic Oral Rehabilitation of a Child With S-ECC: A Case Report with Histopathologic Analysis

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*The aim of this case report is to describe the treatment planning of a young child with severe early childhood caries (S-ECC) as well as the prosthetic rehabilitation technique. A 3-year-old female child was referred to the pediatric dentistry clinic with the chief complaint of tooth pain, difficulty in eating and recurrent hospitalizations caused by dental infections. The mother reported intermittent episodes of fever and recurrent swelling of child's face. The girl presented angular cheilitis and was referred to a dietitian. The treatment plan consisted on a behavior changes in oral hygiene habits, exodontias of all primary teeth and oral rehabilitation with a prosthesis. The extracted teeth with periapical lesions were submitted to histopathologic analysis (hematoxylin and eosin staining) and revealed an inflammatory infiltrate. The aesthetic requirement of children with S-ECC has been a challenge to pediatric dentists. In the present case, the oral rehabilitation provided for the children better aesthetic, nutrition, phonation, and functional conditions.*

**Key words:** Children, Rehabilitation, Prosthesis, Early Childhood Caries.

### INTRODUCTION

Early childhood caries (ECC) is the most prevalent chronic childhood disease, representing a public health problem in worldwide.<sup>1</sup> In Brazil, national data (Brazilian Oral Health Survey - SB Brazil Project 2010) on dental caries showed a prevalence of 53,4% among 5-year-old children.

Consequences of ECC include functional, physical and aesthetic impairment, often with repercussions on children's general health at an early age.<sup>2</sup> Children affected by the disease had a higher risk of new carious lesions, hospitalizations and emergency room visits, increased treatment costs, risk for delayed physical growth and

development, loss of school days and increased days with restricted activity, diminished ability to learn, and diminished oral health-related quality of life.<sup>3-9</sup>

In children aged 3–5 years S-ECC is defined as: one or more cavitated, missing (due to caries) or smooth filled surfaces in primary maxillary anterior teeth, or decayed, missing, and filled surfaces (dmfs) scores of  $\geq 4$  (age 3),  $\geq 5$  (age 4), or  $\geq 6$  (age 5).<sup>10</sup> Treatment of S-ECC is complex and expensive, often requiring extensive restorative treatment and extraction of teeth at an early age and have effects on well-being and quality of life, to individual, family and societal impacts of oral health. In addition, keep a preschooler with an induced anodontia has many negative consequences, however, the rehabilitation of a child's dentition with a complete removable prosthesis is more complex and time consuming than in adults.

Therefore, this case report describes the treatment planning of a young child with S-ECC as well as the prosthetic rehabilitation technique.

### CASE REPORT

A 3-year-old female child was referred to the Pediatric Dentistry Clinic, School of Dentistry, Veiga de Almeida, Brazil with the chief complaint of tooth pain, a difficulty in eating and recurrent hospitalizations caused by dental infections. The mother reported intermittent episodes of fever and recurrent swelling of child's face. The child was receiving breast-feeding daily. The child lives with the mother and four brothers and she was the youngest. Oral habits or a local trauma were not reported.

The clinical examination showed a little child weighing 12 kg (expected weight was 15.4 kg) and her height was 92.3cm (expected height was 98.3cm). The girl presented angular cheilitis and was referred to a nutritional specialist. The general practitioner

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considered that the child was in good general health and could be submitted a teeth extractions. Also, feeding instructions were gave for her mother.

The oral examination showed coronary destruction in all primary teeth (Figure 1). An orthopantomogram revealed no other abnormalities. Extractions were planned every 15 days with local anesthesia with Lidocaine (2% with epinephrine 1:100,000) and physical immobilization (Figure 2). The proposed treatment was to manufacture a complete denture.

It was prepared an individual tray with acrylic resin. After preparation of the upper and lower trays, the impression was performed with polysiloxane (Figure 3). During molding, the lips and cheeks were manipulated to properly record mucobuccal fold). The models were filled with plaster and covered with shellac. The centric positions of the jaws were obtained using occlusal waxes and working models were mounted on an articulator.

The test was made of waxed dentures in the mouth to verify the positions of teeth and occlusal relationships. The experimental prostheses were processed of acrylic resin curing heat. After acrylic

step and adjusts in the prosthesis, final necessary adjustments were made. Recommendations on speech, eating and daily maintenance of the prosthesis was given to parents.

After one week of denture insertion, the patient returned to evaluate oral condition and adaptation. The child was followed up each 15 days. The child improved her social behavior, nutrition and phonation and seemed to have adjusted to the dentures. It was possible to observe the remission of cheilitis. After one year, the child was be whole adapted with the total prosthesis (Figure 4).

### Histological analysis

The extracted primary teeth with periapical lesion were stored in 10% neutral buffered formalin, demineralized in formic acid-sodium citrate solution, dehydrated in ascending concentrations of ethanol, embedded in paraffin, and stained with hematoxylin and eosin (H&E). The prepared slides were examined under a light microscope (Figure 5).

Figure 1. A. Orthopantomograph. B. Initial view revealing the child with S-ECC and angular cheilitis.

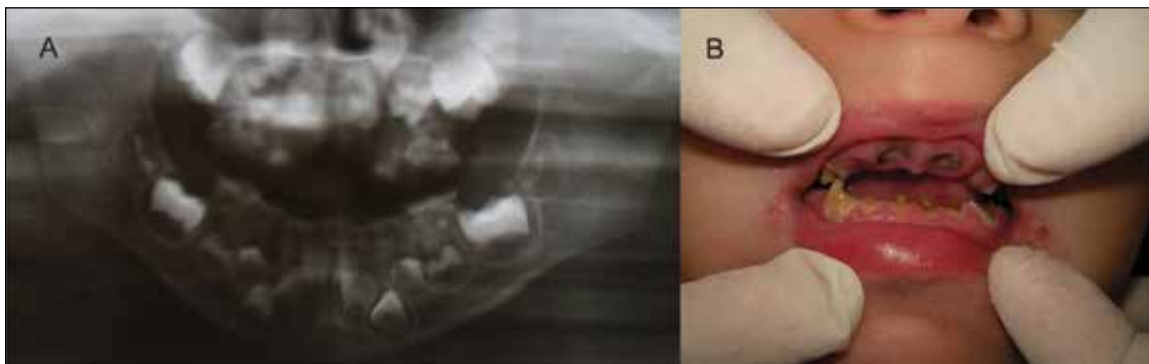


Figure 2. The extracted primary teeth.



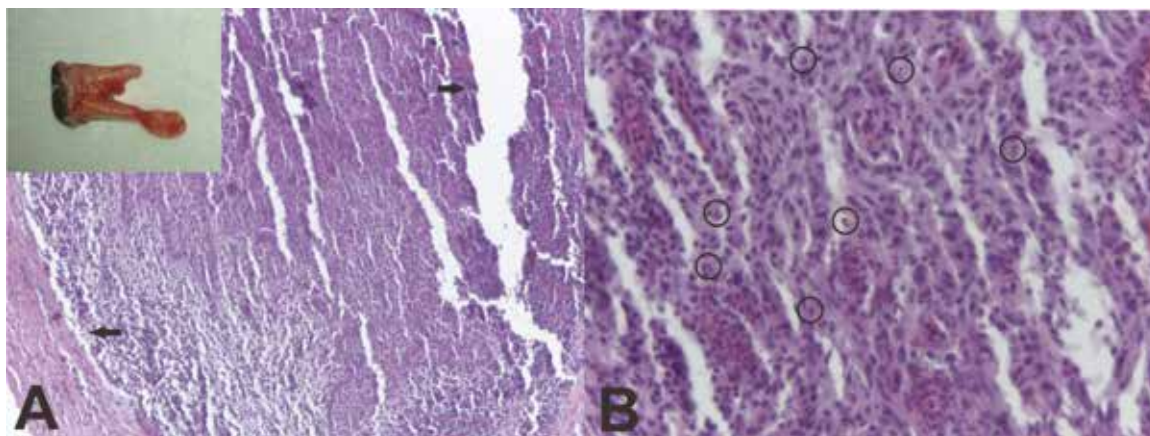
Figure 3. A. Polysiloxane maxillary and mandibular impressions. B. The prosthesis fabricated.



Figure 4. Maxillary and mandibular total prosthesis.



Figure 5. A- Periapical lesion of molar primary teeth and H&E stained slide scan view (40x) showing epithelial tissue surround lesion (left arrow) with the intercellular gaps provided from inflammatory exudate (right arrow). B- H&E stained slide scan view (100x) showing the presence of multiple multinucleated inflammatory cells (circles).



## DISCUSSION

It has been discussed different strategies for preventing dental caries in children at high caries risk, such as the child reported in our case. The case presented here is a typical child that lives in a low income community, with inadequate access to dental services and that consumed a poor diet with breastfeeding, high sugar density and ingests sweets between meals. In agreement with Feldens et al.(2010),<sup>11</sup> the context of low and middle income countries, in which dental caries afflict an important fraction of children soon after one year of age and represent an important disease burden in subsequent years.

As dental caries and childhood diseases share common risk factors such as poor diet, adopting a combined approach rather than one that is condition-specific makes sense. Better infant feeding practices, aside from improving oral and other infectious disease outcomes, reduce risk factors for chronic diseases such as coronary heart disease, stroke, diabetes and cancer.<sup>12</sup> Moreover, breastfeeding 24 months or beyond, similarly with our case, was recently associated with S-ECC. A current study<sup>13</sup> revealed that children with severe ECC appear to have relatively poor nutritional health compared to caries-free controls, and were significantly more likely to have low vitamin D, calcium, and albumin concentrations and elevated PTH levels.

It is important to emphasize that food frequency, putative cariogenicity, and *S. mutans* were associated with S-ECC individually and in combination.<sup>14</sup> In our case, the sugar consumption practices affected all family and tend to be maintained through the years of life. This fact could be proved because the mother is a total edentulous. For this reason, the affected child undergoes long-term and complex treatments, which require interventions from disciplinary teams of health care professionals, including the nutrition. The child comes from a very economically disadvantaged family, with very limited access to health services at all. In this type of neighborhood, treatment is provided very often only in emergency situation, and as soon as the immediate pain, the treatment is discontinued until another acute episode happens. Prior to the child be referred to Pediatric Dentistry Clinic in School of Dentistry, even all the efforts of others professionals for conclusion of treatment, the family's neglect the importance of it and they did not returned.

Considering the histological analysis, the continuous local inflammation can attract inflammatory cells. In these cases, as the result of a severely decayed teeth and local inflammatory reaction, radicular cystic lesions were formed. According to the literature<sup>15</sup>, the cyst wall is lined by proliferating non-keratinized stratified epithelium. A heavy infiltrate of inflammatory cells including polymorphonuclear leukocytes, lymphocytes, plasma cells and histiocytes is found in various proportions. In the present case report, many extracted teeth presented periapical lesion and it was possible to observe the inflammatory infiltrate as the result of S-ECC and pulp compromising. Depending on the extension of the radiolucent lesion and the rehabilitation tooth conditions, the pulpectomy treatment is indicated. In the current case report, the child presented pathologic root resorption, large radiolucent lesions, and impossibility to restore the teeth, thus the adopted conduct was to extract the teeth in order to recover the oral health.

According to the 2010 national survey data, the 5-year-old Brazilian children have more than two caries lesions per child and

that among these children 80% of decayed tooth surfaces were untreated. In this case, the mother revealed that an unmet need for pediatric dental care and the dental infections resulted in hospitalizations and weight loss. All primary teeth were untreated and destroyed. The dental situation was causing a negative effect on a child's overall general health. After the complete denture installed the mother reported that the recurrent infections and the angular cheilitis were resolved and the child was feeding well and gained weight.

Considering the prosthetic rehabilitation technique, the interesting peculiarity in our case was the method of impressions: the first impression was used polysiloxane in the operator's hand to manufacture an individual tray. This innovative method was chosen after numerous attempts to copy the alveolar ridges. It is important to emphasize that the mouth of the child was very small and the pediatric dentist of our team need to be patience, creativity and improvisation during this approach.

Dental disease or dental facial abnormalities bring about disadvantageous psychosocial consequences that affect children, in addition to impairing their speech and eating habits. Thus influenced, children do not smile as often as they would like to.<sup>2</sup>

## CONCLUSION

The present paper reported a case of a child that suffered from S-ECC. The single treatment was extraction of all primary teeth and prosthetic rehabilitation. The oral rehabilitation provided for the children better aesthetic, nutrition, phonation, and functional conditions recovering quality of life for this child and her parents.

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