

## CASE REPORT

DOI: 10.62838/ASMJ.2026.1.13

**Management of severe early childhood caries in a non-cooperative toddler using general anaesthesia: a case report.**Laura DIACONAȘU<sup>1</sup>, Rebeca-Lorena GÂRBOAN<sup>2</sup>, Cristina-Ioana BICA<sup>3</sup><sup>1</sup> Aesthetic Dental Clinic Kids, Târgu-Mureș, Romania<sup>2</sup> Târgu Mureș Emergency Clinical County Hospital, Târgu-Mureș, Romania<sup>3</sup> George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Târgu-Mureș, Romania**Abstract**

**Introduction.** Early childhood caries (ECC) represent a significant challenge in paediatric dental practice, particularly in very young and non-cooperative patients. **Case Presentation.** We report the case of a 2-year-old male patient presenting with multiple abscesses in the maxillary anterior region associated with severe dental destruction. Due to the patient's age, pre-cooperative behaviour, and extensive treatment needs, comprehensive dental treatment was performed under general anaesthesia. Full-mouth rehabilitation was completed in a single session lasting approximately 2 hours and included endodontic treatment, zirconia crowns, stainless-steel crowns, composite restoration, and preventive sealing. The postoperative course was uneventful, with satisfactory clinical outcomes on follow-up. **Conclusions.** This case highlights the importance of general anaesthesia in managing severe ECC and supports the use of combined restorative approaches to achieve functional and aesthetic rehabilitation in very young paediatric patients.

**Keywords:** early childhood caries; general anaesthesia; zirconia crowns; stainless steel crowns; case report.

**Introduction**

ECC is considered a chronic disease of childhood and a public health problem worldwide and it is defined as the presence of one or more decayed, missing or filled tooth (dmfs) surfaces in any primary tooth. In children younger than 3 years of age, any sign of smooth-surface caries or dmfs score greater than or equal to four is considered severe early childhood caries (S-ECC) by The American Academy of Paediatric Dentistry (AAPD). [1] Untreated ECC can lead to pain, infection, difficulties in mastication, speech and overall development of the child, negatively affecting the quality of life of both the child and their family. [2]

The management of this disease in very young children is challenging due to limited cooperation and the extent of dental destruction. In such cases, conventional dental treatment may be impossible to perform safely. Therefore, treatment under general anaesthesia is indicated, allowing dental rehabilitation in a single session. General anaesthesia is indicated in paediatric patients who are pre-cooperative or require extensive dental treatment, particularly when conventional chair-side management has failed [3].

The present paper reports a case of a 2-year-old patient with severe ECC managed through full-mouth rehabilitation under general anaesthesia, highlighting clinical decision-making and treatment outcomes.

**Case Presentation**

A 24-month-old male patient was referred to general anaesthesia treatment after multiple attempts of chair-side treatment with the main complaint of multiple dental fistulae, pain, inability to eat and maintain oral hygiene. The patient had no significant medical history, no known allergies, and was classified as ASA I. According to the parents, the child had frequent consumption of cariogenic foods and prolonged bottle-feeding habits, associated with inadequate oral hygiene measures. No relevant social or family history was reported. Following multidisciplinary assessment and appropriate preoperative investigations, treatment under general anaesthesia was indicated in order to allow accurate dental diagnosis, comprehensive treatment planning and safe delivery of all necessary therapeutic procedures. After the nasotracheal intubation (NTI) performed by the anaesthesia team, based on clinical and radiographic findings, the

following diagnoses were established: tooth 52 with chronic pulpitis, while teeth 51, 61, and 62 exhibited pulp necrosis associated with chronic apical periodontitis. Additionally, teeth 71 and 81 exhibited moderate structural loss, with approximately half of the coronal tooth structure missing. Occlusal carious lesions

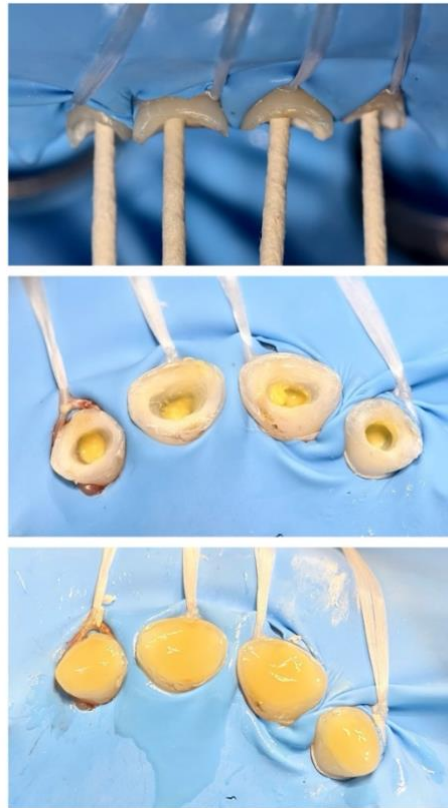
were also identified on teeth 54, 64, 74, and 84. Upper and lower canines were healthy, while the maxillary second primary molars had not yet erupted. In the mandibular arch, tooth 75 was clinically healthy and was sealed preventively, while tooth 85 was partially erupted.



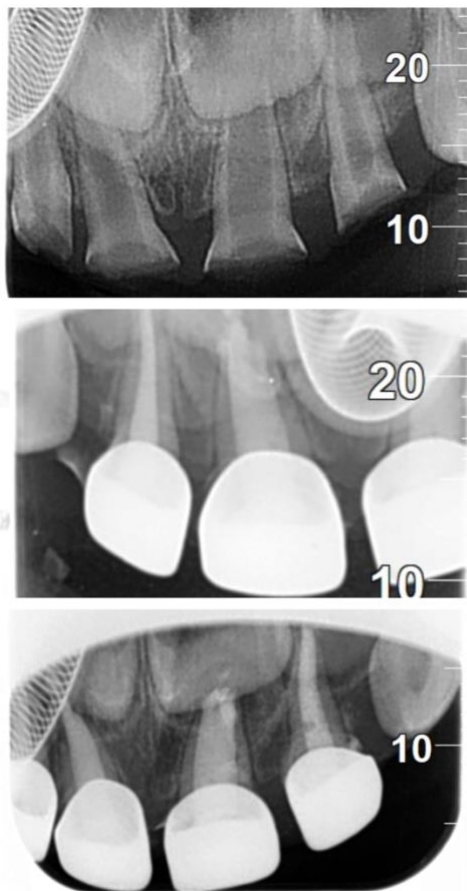
**Figure 1.** Preoperative photographs showing severe destruction of maxillary incisors (52, 51, 61, 62) associated with dental fistulae, moderate carious lesions in teeth 54, 64, 74, and 84 and structural loss in mandibular incisors (71, 81)

The treatment plan included endodontic treatment of the four upper incisors under rubber dam isolation. Working length was determined radiographically. Biomechanical preparation was performed using paediatric rotary files under copious irrigation with 2.5% sodium hypochlorite solution, 17% EDTA, and saline solution. The root canals were dried with sterile paper points and obturated using a calcium hydroxide-iodoform paste. Following endodontic treatment, core build-

up was achieved using composite resin material. Preformed zirconia crowns were selected according to the manufacturer's recommendations and cemented using glass ionomer luting cement after appropriate tooth preparation and haemostasis control. The mandibular incisors were restored with zirconia crowns following indirect pulp capping in order to ensure optimal aesthetic outcomes and durable restorations.



**Figure 2.** Intraoperative photographs showing the steps of endodontic treatment and core build-up



**Figure 3.** Before and after endodontic treatment of upper incisors radiograph examination.

Posterior teeth were managed by means of indirect pulp capping, followed by restoration with preformed stainless-steel crowns for teeth: 54, 64, and 84, and resin

composite restoration for tooth 74. In addition, as part of the preventive strategy, a fissure sealant was applied to tooth 85.



**Figure 4.** Postoperative intraoral photography showing the prosthetic treatment with zirconia and stainless-steel crowns

### Discussion

The postoperative period was uneventful, with no intraoperative or postoperative complications. The patient showed good recovery and was discharged in stable condition. At follow-up, satisfactory healing and good adaptation to the restorations were observed.

ECC has a negative impact on children's life including pain while sleeping or mastication, reduced appetite and weight loss [4]. The age of 2-4 is considered very important and partial or total loss of anterior teeth at this age will cause physiological imbalance and could affect their self-esteem and even social skills [5]. Dental treatment under general anaesthesia is supported in the literature for patients with extensive treatment needs and limited ability to

cooperate and remains a necessary and justified approach in paediatric dentistry, particularly in severe caries and behavioural non-cooperation [6,7]. However, it is suggested that children under 3 years of age should be exposed to a short and single session of general anaesthesia [8].

Considering the need for a fast, but also long-lasting restoration, paediatric preformed crowns are the ideal treatment option. It is also revealed in the literature that the survival time of dental restorations with preformed crowns was prolonged and the success rate of indirect pulp capping was also significantly higher than those without crowns [9]. In this case, preformed crowns were cemented, following indirect pulp capping for teeth: 71, 81, 54, 64, 84.

There have been several documentations on the use of zirconia crowns in severely destroyed primary teeth [10,11]. Teeth 52, 51, 61, 62 were restored with preformed zirconia crowns, following endodontic treatment, in this case. The major concern in these clinical situations is the failure of the anterior restorations. There are studies showing that pulp therapy does not significantly alter the outcome of the crowns, but considering the major loss of tooth structure, debonding of the crown can be an issue [12].

### Conclusion

Early childhood caries requires prompt intervention and extensive work. The present case highlights the challenges associated with the management of severe early childhood caries in a very young and uncooperative patient. Treatment under general anaesthesia proved to be an effective approach, allowing all necessary procedures in a single session. The combined use of zirconia crowns for anterior teeth and stainless-steel crowns for primary molars underlines the importance of individualised treatment planning. This case supports the role of general anaesthesia in the successful management of severe dental condition in paediatric patients.

### Author Contributions (CRediT Taxonomy)

Conceptualisation, Data curation, Writing – original draft: L.D.

Data curation, Writing – review & editing: R-L.G.

Supervision, Validation, Writing – review & editing: C-I.B.

### Acknowledgments

The authors would like to thank all individuals involved in the clinical management of the patient. No external support was received.

### Conflict of Interest

None to declare.

### Funding

No external funding was received.

### Ethical Approval

Ethical approval was not required for this case report.

### Informed Consent

Written informed consent was obtained from the patient's legal guardian for publication of this case report and accompanying images.

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### Generative AI Statement

During the preparation of this work, the authors used ChatGPT to improve language and clarity. The authors reviewed and edited the content as needed and take full responsibility for the originality and integrity of the manuscript.

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Received: April 27, 2026/ Accepted: May 30, 2026