

Oral rehabilitation of a 14-year-old quadriplegic child with cerebral palsy under general anesthesia: A case report

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ABSTRACT

Cerebral palsy is a neuromuscular disorder in which patients deal with dysfunction in motor coordination in addition to other problems like epilepsy. Due to disrupted motor functions, the oromotor coordination is also affected, leading to higher incidence of dental caries, which is also due to increased consumption of medications. This case report deals with the oral rehabilitation of a quadriplegic 14-year-old child with cerebral palsy, suffering from severe dental pain and who was treated under general anesthesia.

Keywords: Cerebral palsy, hemangioma, oral rehabilitation

Introduction

Cerebral palsy (CP) is a central nervous system disorder of movement, coordination, and posture, reflecting a non-progressive abnormality or insult to the immature brain.^[1] In India, nearly 15%–20% of the total number of physically handicapped children suffer from CP.^[2]

CP can be broadly classified into spastic, dyskinetic, ataxic, and mixed types. The most common type is the spastic variety (75%) and primarily occurs due to a lesion in the cerebrum. The symptoms associated with the spastic type include hyperirritability of involved muscles and lack of coordination of intraoral, perioral, and masticatory musculature. The dyskinetic type (15%)—caused by a lesion in the basal ganglia—is

characterized by aberrant postures or motions linked to poor muscle tone and poor control or coordination of movement. The majority of the time, dystonia and choreoathetosis coexist in this type.^[3] The ataxic type (5%) occurs primarily due to a lesion in the cerebellum; it is characterized by tremors, impaired speech, and loss of balance. The mixed type (10%) occurs primarily due to a lesion in the cerebellum and cerebrum.^[4,5]

Children with CP develop oral manifestations, such as plaque accumulation and dental caries, due to various factors like their inability to maintain good oral hygiene, increased use of medications, and dietary patterns such as soft diet and difficulty in chewing and swallowing.^[6] Oral hygiene maintenance is not in the forefront in these kids due to various other medical complications. Medical complications pose a risk for oral rehabilitation through pharmacological management.^[7] But there is scarce data on dental treatment and management of high-risk patients with CP. The need for more detailed reports about oral rehabilitation in high-risk CP patients with varied medical complication needs to be brought to the limelight. Hence, this

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Received: 30-12-2022

Revised: 05-03-2023

Accepted: 21-03-2023

Published: 21-11-2023

Access this article online

Quick Response Code:



Website:
<http://journals.lww.com/JFMPC>

DOI:
10.4103/jfmprc.jfmprc_2517_22

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How to cite this article: Baviskar M, Mudaliar A, Kodical SR, Chaudhary C, Valke P. Oral rehabilitation of a 14-year-old quadriplegic child with cerebral palsy under general anesthesia: A case report. *J Family Med Prim Care* 2023;12:2983-6.

case reiterates the importance of oral care in children with special health care needs that can improve their quality of life.

Case Report

A 14-year-old male child weighing 11 kg and having quadriplegic cerebral palsy reported to the Department of Pediatrics and Preventive dentistry with a chief complaint of pain and bleeding gums in the upper and lower left back region of the jaw that did not relieve on medication.

The child was born full term and weighed 2.15 g at birth. He suffered from neonatal sepsis and hypoglycemia at birth. Convulsions with meningitis had occurred on day 3; he had been admitted due to high fever and tonic posturing that required ventilatory support. Ultrasonography of the brain showed signs of mild cerebral edema.

Delayed milestones with microcephaly at eight months was noted, for which an MRI was performed that showed cystic encephalomalacia. At 11 months, the patient had a seizure for which an EEG was done, which revealed predominantly right occipital interictal epileptiform discharges. He was prescribed Valparin and Gardenal for the same. After two years, an EEG revealed right mid-temporal epileptiform activity. The last episode of seizure documented was at age five. The child was currently not on any medication. The medical history, general examination, and posture made general anesthesia (GA) difficult and regular dental treatment a high risk.

The patient's dental history revealed pain had started two months ago, for which he had been medicated with antibiotics and analgesics. Definitive treatment was suggested under general anesthesia.

The general examination of the patient revealed an elongated face, deformed chest, and severe wasting of muscles. Clinical and oral examination was not possible but was suggestive of multiple carious teeth along with enlarged and bleeding gums from the upper left back teeth region of the jaw.

A tentative treatment plan for complete rehabilitation under general anesthesia was planned. Routine blood investigations and chest X-ray were carried out. This revealed a hemoglobin (Hb) level of 5 mmHg; hence four cycles of blood transfusion were needed to bring the Hb level to 10 mmHg. Anesthetic clearance was followed by a high-risk informed consent from the parents.

The child was admitted and kept NBM for six hours on the day of the planned treatment. Nasal intubation was difficult due to excessive secretions and tonic positioning, restricted neck movement, and airway curvature. [Figure 1-Duly signed parental consent was taken to use the photographs in this article]. After a dental examination [Figure 2], thorough oral prophylaxis and glass ionomer restorations of the maxillary and mandibular first premolars, maxillary left second premolar, mandibular second premolars, and maxillary and mandibular left second permanent molars were done. The extractions of the pulpally involved teeth (maxillary permanent lateral incisors); grossly carious teeth (maxillary and mandibular first permanent molars; maxillary right second premolar) and grade II mobile teeth in the mandibular permanent central incisors were carried out. The bleeding was controlled with absorbable surgical gelatin sponge, and extraction sockets were sutured using Vicryl 3-0 resorbable suture [Figure 3].

A gingival enlargement measuring $7 \times 3 \times 3$ mm was present on the palatal surface of the maxillary left first permanent molar that was inflamed and that had a bluish red discoloration. The tissue was excised for biopsy with clear margins, and bleeding was arrested and sent for histopathological investigations.

The child was monitored for a day [Figure 4] and discharged the following day after providing postoperative diet and oral hygiene guidance to parents. One-week follow-up showed satisfactory healing of the extraction sites.

Histopathology of tissue showed ulcerated, proliferative, parakeratotic, stratified squamous epithelium and underlying connective tissue stroma, with numerous engorged capillaries and



Figure 1: General examination

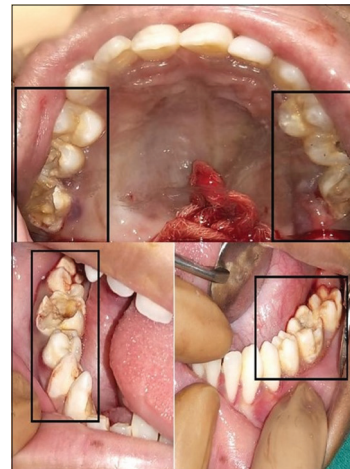


Figure 2: Preoperative intraoral pictures

cavernous spaces that were lined by thin epithelium, suggestive of hemangioma [Figure 5].

Discussion

CP is a non-progressive brain disorder that causes defects in the central nervous system, leading to abnormal motor function, muscle tone, and movements.^[8] There are many classifications for

cerebral palsy; most cases are commonly classified into three major categories, namely, pyramidal (spastic), extrapyramidal, and mixed. The pyramidal type is further subclassified into quadriplegic, hemiplegic, diplegic, and monoplegic types. The extrapyramidal type is further subclassified into chorea, athetotic, ataxic, dystonic, and rigid varieties. The mixed type is a combination of cerebral palsy of pyramidal or extrapyramidal types.^[9] The current case report is of a spastic quadriplegic cerebral palsy patient.

The management of these children poses a challenge for the treating dental surgeon because of difficulty in communication, uncontrolled involuntary movements, abnormal posture, inability to open the mouth properly, and multiple dental procedures to be carried out, as was seen in the present case.^[10] Hence, general anesthesia is the management of choice for oral rehabilitation.^[11]

Jaya *et al.*^[12] discussed a case report of a six-year-old male patient diagnosed with CP of the spastic type and who underwent full-mouth oral rehabilitation under general anesthesia following a complete recovery. Chengappa *et al.*^[13] presented clinical cases of two children, aged four and five years, who were diagnosed with CP and who were managed with therapeutic and preventive intervention under general anesthesia. Loyola-Rodriguez *et al.*^[14] did a study comparing oral rehabilitation between children and adolescents under dental general anesthesia, conscious sedation, and conventional techniques in patients affected by cerebral palsy. 38 patients were included having a mean age of 7.14 ± 2.2 years for children's group and 18.5 ± 3.06 years for adolescent and young adult group. It was concluded that general anesthesia with sevoflurane-propofol and conscious sedation were an excellent tool to provide dental treatment in CP patients in a dental school setting without most of the major postoperative complications, such as nausea and vomiting.

Postoperative follow-up and providing guidance to parents/caregivers is of great importance for the long-term success of the treatment. Thus, a multidisciplinary approach with the active involvement of the caregiver and long-term follow up is an important strategy for promoting health and improving oral health-related quality of life of patients with CP.^[13] Every individual is different even children suffering from CP. Treatment plan for each child differs hence customized treatment plan should be made keeping in mind his medical condition and long term dental needs.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Figure 3: Postoperative intraoral pictures



Figure 4: Postoperative general examination

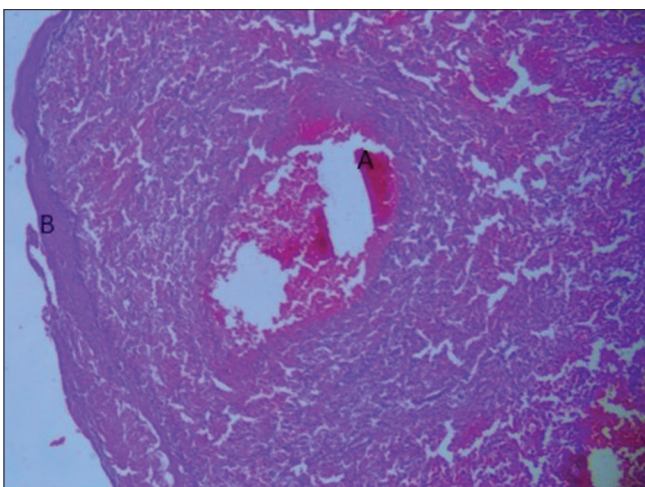


Figure 5: Histopathology picture (hematoxylin and eosin staining done and observed at 0.5 μ m resolution). (A) Engorged capillaries, (B) Proliferative, parakeratotic, stratified squamous epithelium

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