

Oral Rehabilitation of Cerebral Palsy Patients under General Anesthesia in a Zonal Hospital: A Novel Technique

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Abstract

Introduction: Cerebral Palsy is a group of disorders causing damage to the motor control centres of the brain, which in turn cause defects in psychomotor activity manifested as mental and motor disabilities, sensory defects in vision, hearing, abnormal contraction of joints and behavioural problems. These children have an increased risk of developing ECC (Early Childhood Caries) due to various factors leading to poor oral hygiene. **Case Report:** This case report presents clinical cases of two children aged 4 & 5 yrs respectively diagnosed with Cerebral Palsy who were managed with therapeutic and preventive intervention under General Anaesthesia. **Uniqueness of the Case:** Management of Early Childhood Caries in such children is a challenge. Improvement of quality of life is of paramount importance. **Conclusion:** Behavioural problems are common amongst these children and single visit complete oral rehabilitation under General Anaesthesia leads to improvement of oral health related quality of life, overall wellbeing and attitude of parents.

Keywords: Cerebral palsy, early childhood caries, general anesthesia, oral rehabilitation

INTRODUCTION

Cerebral palsy is a nonprogressive brain disorder which causes defects in the central nervous system leading to abnormal motor function, muscle tone, and movements.^[1] There are many classifications for cerebral palsy; most commonly it is classified into three major categories, i.e., pyramidal (spastic), extrapyramidal, and mixed. 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.^[2] These children have a preponderance to develop oral manifestations such as dental caries and plaque accumulation as compared to the general population due to various factors such as the inability to maintain good oral hygiene, dietary patterns such as soft diet difficulty in chewing and swallowing, and increased use of medications.^[3] They also have an increased incidence of gingival hypertrophy, hypoplastic teeth, and injuries to upper front teeth.^[4] These children may require pharmacological management in most cases due to the associated behavioral challenges.^[5,6]

Submitted: 22-Jul-2019 Revised: 11-Oct-2019

Accepted: 22-Jan-2020 Published: 17-Mar-2021

The following case series is of children diagnosed with cerebral palsy suffering from severe early childhood caries managed with fullmouth rehabilitation under general anesthesia.

CASE REPORT-1

Chief complaint and case history

A male child aged 5 years and 6 months, a recorded case of cerebral palsy of the spastic type, was brought to the department by his parents. The parents gave a complaint of pain in the upper and lower back tooth region for the past 6 months. The parents informed that the child was having difficulty in chewing food and on completion of the general examination was detected to be malnourished; the child was undergoing treatment, physiotherapy for spastic type of cerebral palsy, and was unresponsive to verbal commands. The parents had taken the child earlier to another center for dental treatment, but the treatment could not be accomplished due to behavioral issues of the child. The family history and prenatal history revealed

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How to cite this article: Chengappa MM, Kannan A, Naidu CS, Ghavri T. Oral rehabilitation of cerebral palsy patients under general anesthesia in a Zonal Hospital: A novel technique. *Int J Pedod Rehabil* 2021;5:76-9.

Access this article online

Quick Response Code:



Website:
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DOI:
10.4103/ijpr.ijpr_15_19



Figure 1: Preoperative maxillary arch case 1.



Figure 2: Preoperative mandibular arch case 1.



Figure 3: Postoperative maxillary arch case 1.



Figure 4: Postoperative mandibular arch case 1.



Figure 5: Preoperative maxillary arch case 2.



Figure 6: Preoperative mandibular arch case 2.



Figure 7: Postoperative maxillary arch case 2.



Figure 8: Postoperative mandibular arch case 2.

nothing significant. The postnatal history of the child revealed a delayed birth cry and subsequent intubation and admission in a neonatal intensive care unit for 7 days.

Intraoral examination and diagnosis

The child was positioned on his parent to provide restraint, and the mouth was stabilized using mouth gags to perform the intraoral examination. The intraoral examination revealed dental caries in relation to 51, 52, 53, 54, 55, 61, 62, 64, 65, 74, 75, 84, and 85, pulpal involvement was found in relation to 52, 54, 62, 64, 74, 84, 85, and 75 was found to be grossly decayed. A provisional diagnosis of chronic irreversible pulpitis was found in relation to 54, 52, 62, 64, 74, 75, 84, 85, dental caries 51, 54, 61, 64 and grossly decayed in relation to 75 [Figures 1 and 2]. Radiographic investigation in the form of radiovisiography was carried out, and this confirmed the final diagnosis.

Treatment plan and preoperative

The treatment plan for complete rehabilitation included a preparatory phase in which the parents were counseled and dietary instructions were given, a corrective phase which included endodontic treatment and restoration of all restorable teeth, and a surgical phase which included extraction of unsavable tooth was drawn out. This treatment plan was discussed with the parents, and the child was referred to the department of anesthesiology for carrying out preanesthetic checkup. Furthermore, routine blood examination and tests for viral markers were carried out. After the test results were obtained, the parents were once again explained the procedure, and informed consent was obtained from them. The child was then admitted in the pediatric ward a day before the procedure and was taken up for fullmouth rehabilitation under general anesthesia in the American Society of Anesthesiologists (ASA) II.

Procedure

The child was brought to the operation theater, and after premedication, nasal intubation was carried out. The child was scrubbed, draped, and routine oral hygiene was carried out. Pulpectomy was carried out on 54, 52, 62, 64, 74, 84, and 85, composite restorations were carried out on 55, 52, 51, 61, 62, 65, and 84, and stainless steel crowns were placed on 54, 74, and 85. The grossly decayed 75 was extracted. The results of the procedure are shown in Figures 3 and 4.

Hemostasis was achieved; the child was extubated uneventfully and transferred to the recovery area. The operating time for the procedure was 3 h.

Postoperative and follow up

The child was handed over to the parents and kept in the ward for monitoring recovery from anesthesia. He was discharged the following day after the parents were explained about the postoperative care and recall visits. The child was recalled after a week, and the parents were quite satisfied as the child had sound sleep and his eating pattern had improved considerably. The child was kept on a 3-month follow-up routine.

CASE REPORT-2

Chief complaint and case history

A male child aged 4 years who was previously diagnosed as a case of cerebral palsy came to the department with his parents. The parents gave the complaint that the child was not chewing his

food properly and had disturbed sleep. The parents informed that they found it very difficult to maintain the child's oral hygiene, as he was unresponsive to the verbal commands. This child was also undergoing treatment and physiotherapy for spastic type of cerebral palsy. This was the child's first exposure to a dental treatment facility. The family history and prenatal history revealed nothing significant. The postnatal history of the child revealed that he had suffered from high fever for a prolonged period when he was 6-month old accompanied by seizures.

Intraoral examination and diagnosis

The child was restrained by his parent, and the mouth was stabilized using mouth gags to perform the intraoral examination. The intraoral examination revealed dental caries in relation to 51, 61, 55, 65, 73, and 74 deep dental caries was found in relation to 54, 64, 75, 85, and 84. Seventy-five was also found to be grossly destroyed. A provisional diagnosis of chronic irreversible pulpitis in relation to 75, 85, and 84 deep dental caries without pulpal involvement was made clinically on 54 and 64 and dental caries in relation to 51, 61, 55, 65, 73, 74 and grossly destroyed 75 was made [Figures 5 and 6].

Treatment plan and preoperative

The treatment plan for complete rehabilitation which included the three phase-based approach mentioned earlier. This treatment plan was explained to the parents, and the child was referred to the department of anesthesiology for preanesthetic checkup. Routine blood examination and tests for viral markers were also carried out. The child was admitted in the pediatric ward a day before the procedure and was posted for fullmouth rehabilitation under general anesthesia in ASA II.

Procedure

On the day of the procedure, the child was brought to the theater by the parent and given premedication before being intubated, scrubbed, and draped, and institution of routine oral hygiene procedures. Pulpectomy was carried out on 75, 85, and 84. Indirect pulp capping was done on 54 and 64. Composite restorations were carried out on 51, 61, 55, 65, 73, and 74, and stainless steel crowns were placed on 75, 84, and 85 [Figures 7 and 8]. The child was extubated uneventfully after the removal of throat pack and transferred to the recovery area. The operating time for the completion of the procedure was 3 h.

Postoperative and follow-up

The child was handed over to the parents and kept in the ward for monitoring the recovery from anesthesia. As the recovery was uneventful, the child was discharged the following day after the parents were explained about the postoperative care and recall visits. The child was recalled and was advised a 3-month follow-up routine.

DISCUSSION

Cerebral refers to the brain and palsy refers to a disorder of movement or posture. Cerebral palsy is a central nervous system disorder of movement, coordination, and posture, reflecting a nonprogressive abnormality or insult to the

immature brain.^[7] This condition is one of the most common forms of neuromuscular disabilities affecting children; the worldwide incidence of the condition is 2–2.5 cases/1000 live births.^[8] The incidence of the condition in India is estimated to be around three cases/1000 live births.^[9] The exact etiology of the condition can be identified in only 40%–50% of the cases and may be broadly divided into prenatal, perinatal, and postnatal factors, and the primary eventual pathology is trauma to the developing brain.^[10] Cerebral palsy can be classified broadly into spastic, dyskinetic, ataxic, and mixed type. The most common type is the spastic variety accounting for approximately 75% of the total cases and is primarily due to lesion in the cerebrum. The symptoms associated with the spastic variety include hyperirritability of involved muscles and lack of coordination of intraoral, perioral, and masticatory musculature. The dyskinetic type caused by lesion in basal ganglia accounts for approximately 15% of the cases. The ataxic type accounts for approximately 5% of the cases and is caused primarily due to lesion in the cerebellum; it is characterized by tremors, loss of balance, and speech. The mixed variety accounts for approximately 10% of the cases and is primarily due to a lesion in the cerebrum and cerebellum.^[11]

This disability usually involves various associated problems such as mental retardation, seizure disorders, sensory deficits, speech and behavior disorders, abnormal joint contractures, periodontal disease, dental caries, malocclusion, and bruxism. These children are also more prone to trauma.^[12] The management of these children poses a challenge for the treating dental surgeon because of uncontrolled involuntary movements, difficulty in communication, inability to open the mouth properly, abnormal posture, and multiple dental procedures to be carried out, as was seen in the present cases.^[13] Hence, general anesthetic management of such children with multiple dental problems is the most effective method to provide comprehensive care. These children had multiple teeth which had deep carious lesions, and considering the age of these children, it was vital to save these teeth to allow for normal development of the arches. Pulp therapy in the form of pulpectomy was the only viable option to save these carious teeth.^[14] Stainless steel crowns are the best restorative material in primary dentition; the use of these crowns in children with cerebral palsy is even more pertinent keeping in mind the high incidence of bruxism among these children.^[15] Postoperative follow-up with guidance to parents/caregivers is also of great importance in long-term success of treatment. Thus, it is very important to provide oral hygiene, diet, and home care-related guidance to the caregiver before the discharge of the child.^[16] Oral health-related problems in children with cerebral palsy may be due to decreased importance to oral health in comparison to the overall scheme of health of the child. Thus, a multidisciplinary approach with the active involvement of the caregiver and long-term follow up is an important strategy in promoting health and improving oral health-related quality of life.^[17]

SUMMARY AND CONCLUSION

Complete oral rehabilitation of a child with cerebral palsy was found to enhance the oral health-related quality of life of the child. Guidance and education of caregivers with relation to the special needs of these children along with long-term follow-up

is the best way to complement therapeutic care under general anesthesia for the overall well-being of the child.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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