International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

Dental Management in Children with Cerebral Palsy Type Spastic Quadriplegia: A Case Report

Ruth Christiana Juwitaningrum[1], Arlette Suzy Setiawan[2]

[1, 2] UniversitasPadjadjaran, Faculty of Dentistry, Pediatric Dentistry Department,
Sekeloa Selatan Road 1st Bandung, West Java, Indonesia 40132

Abstract: ***Cerebral palsy is a group of permanent movement disorders that appear in early childhood with a vary signs andsymptomsincludepoorcoordination, stiffmuscles, weak muscles, and tremors.This case report aims to provide clinicians with general description of dental and oral health care for children with cerebral palsy under general anesthesia. A 3.5-year-old boy came with his parents to Al Ihsan General Hospital, complaining of many cavities in their child's teeth. The patient has been diagnosed by a pediatrician with cerebral palsy type spastic quadriplegia. Intra-oral examination showed multiple caries with pulp involvement.The treatment plan was mouth preparation under general anesthesia, consists of scaling, dental restorations, extractions, and topical fluoride application. The patient with cerebral palsy type spastic cannot control the desired movement, has a hyperactive reflex, and often had seizures. These conditions will make the dental treatment being so difficult. Dental treatment with general anesthesia can be used as the last solution for providing dental and oral health care for the patient with cerebral palsy. Management of dental and oral health care in cerebral palsy patients should be done with a multidisciplinary and comprehensive manner for the optimum treatment results.***

Keywords: cerebral palsy, spastic quadriplegia, dental management

1. Introduction

Cerebral Palsy (CP) is one of the neurological chronic diseases that affect the motoric control center. CP is not caused by muscle problem or peripheral nerve tissue, but rather a result of developmental disturbance or abnormalities in the motoric area of the brain caused by damage at the beginning of its development. This condition can occur during fetus/ prenatal, perinatal, or infant/ postnatal, before the central nervous system grows perfectly. This can interfere with the brain's ability to significantly control movement and posture.[1–5]

According to the Dorland medical dictionary, CP is a permanent motoric disorder, non-progressive, and caused by brain damage due to birth trauma or pathological intrauterine conditions. This condition is characterized by an abnormal or late motoric development that causes limited function of extremities. Motoric movement development disorders are generally accompanied by sensory disturbances (vision and hearing), perception, cognitive, communication and behavior, epilepsy and the presence of a secondary skeletal muscle disorder.[6–9]

In some industrialized countries, the incidence of CP ranges from 2-2.7 of 1000 births. Surveillance of Cerebral Palsy in Europe (SCPE) reported a higher incidence in men than women with a ratio of 1.33: 1. CP is often found 10 times more in premature infants and in very young infants.[3,4]Classification of CP aimed for predicting prognosis and treatment plans based on changes in the muscle tone, the affected anatomy and the severity. CP can be grouped into three groups: mild, moderate, and severe. Patients with severe CP show inability to walk and require extensive and long-term care.[1,9,10]

American Academy for Cerebral Palsy suggests classification of clinical features of CP based on motoric disorders: spastic, athetoid, dyskinetic, ataxia, and combination. Based on the number of extremities affected, CP is classified into monoplegia, hemiplegia, paraplegia, triplegia, diplegia, and quadriplegia.[7,9,11] CP type spastic is the most common with 75% of CP cases in the world. The characteristic of these condition consists of muscle tone and excessive contractions, pathological and hyperactive tendon reflexes. The incidence of athetoid type about 20-25% of CP patients with the characteristic form of repetitive muscle movements and can be excessive if the patient is nervous. CP type ataxia occurs with a percentage about 10% of all CP patients and it characterized by a balance disorder.[2–4,10]

The initial signs of CP are generally seen before 3 years of age, and parents can start to realize when the child's motoric development ability looks abnormal. Children with CP is often to have a developmental delay, such as prone position, sitting, crawling, smiling, and walking. Mental retardation can also occur in children who have severe CP as in spastic quadriplegia types. Epilepsy is found in 36% of CP patients. Epilepsy shows the severity of neurological lesions in CP type quadriplegia or cortical involvement in CP type hemiplegia. Children with CP tend to have nutritional problems, due to poor coordination in the upper motoric nerves of the body which resulting a weak muscle coordination during the swallowing and often drooling.[1,4,12,13]

Maintenance and improvement of oral hygiene is very important for each individual, including individuals with special needs. In general, dental professionals focus more on oral cavity diseases such as caries and periodontal disease. For patients with CP, the condition of maintaining oral health becomes more difficult due to motoric limitations suffered so that the patient is not able to carry out the oral cleansing movement optimally. Caries prevalence in patients with CP increases especially in patients with long-term care with sweeteners or drugs that cause xerostomia. Other conditions that can also accompany abnormalities in the oral

cavities of patients with CP are enamel hypoplasia, accumulation of food debris, masticatory muscle activity disorders, and disturbance of the ingestion process which causes food to stay in the oral cavities more longer.[9]

Dentists often find some difficulties to provide dental treatment and oral health care in children with CP. Dental and oral health care in these patients requires special treatment to control the motoric constraints that exist, both with restrain movement of the patient, medication, and also dental treatment under general anesthesia. Most CP patients suffer from their dental problems. The incidence of dental caries, periodontal disease and malocclusion of CP patients is higher than normal children. Maintenance of dental and oral health care in children with CP also requires the role of parents, physiotherapists, pediatricians, neurologists, and other health teams.[14] This case report aims to provide clinicians and parents with information and a general description of dental and oral health care for children with CP under general anesthesia.

2. Case Report

A 3.5-year-old boy came with his parents to Al Ihsan General Hospital, complaining of many cavities in their child's teeth. The patient's parents want their child's teeth to be treated properly. Based on the medical history, the patient has been diagnosed by a paediatrician with a cerebral palsy type spastic quadriplegia. The age of mother when pregnant was 31 years and father was 38 years. This patient was born in 36 weeks of pregnancy. The weight was 2.8 kg with spontaneous birth and the child immediately cries at birth.

General medical history of the father and mother is healthy, but there is a history trauma in second months of pregnancy when the mother has fallen, but there was no bleeding history. This patient is the second child of two siblings. The patient had a breastfeeding for 7 months. At 1.5 months of age, he often vomits until hospitalized and had CT scanned. This patient can prone, sit, make eye contact, smile, and say the word at the age of 2 years. He cannot crawl, stand up, or walk until now. Other medical history that also accompanies this patient is microcephaly, epilepsy and also had hernia surgery at 4 months and 7 months of age. Cousins from the patient's mother also had a history of the same disorder.

Figure 1: The child showed difficulties when examining the face profile and body posture.

Extra oral examination consists of examining the face profile and body posture. This examination is difficult because the age of the child is too young and also the general condition of the child is not possible to perform examination perfectly as shown in figure 1. Intra-oral examination showed teeth 53, 54, 55, 65, 64, 63, 75, 74, 73, 72, 83, 84, 85 with dentine caries and 52, 51, 61, 62, 71, 81, 82 with pulp involvement caries (figure 2). There is no previous dental treatment has been done before.

Figure 2: Intra-oral features of the upper and lower jaw showed many teeth that have caries.

Diagnosis based on results of history, extra oral and intra oral examination are reversible pulpitis in teeth 55, 54, 53, 63, 64, 65, 75, 74, 73, 72, 83, 84, 85 and pulp necrosis in teeth 52, 51, 61, 62, 71, 81, 82. Treatment plan to performed are dental restoration in teeth 55, 54, 53, 63, 64, 65, 75, 74, 73, 72, 83, 84, 85 and extraction on teeth 52, 51, 61, 62, 71, 81, 82 under general anesthesia. The dental treatment was performed after obtaining parental informed consent and approval from the pediatrician, neurologist, and anesthetist.

3. Case Management

Mouth preparation is performed under general anesthesia. The initial treatment was extra oral and intra oral asepsis with povidone iodine, followed by scaling in all regions of teeth (figure 3). Caries in the cavity were excavated with a sharp excavator, followed by preparation using a sterile round bur until healthy dentin was obtained. Teeth 55, 53, 63, 65, 75, 73, 72, 85, and 83 were filled with glass ionomer cement restorations, while teeth 54, 64, 74, and 84 were filled with composite restorations with vitre bond lining on the basis of their cavities because teeth 54, 64, 74, and 84 have only a very thin layer of healthy dentine, so they need to be protected by lining. Polishing the restoration is performed to obtain a smooth surface of the restoration (figure 4). Topical fluoride application with fluoride varnish was performed after all cavities were filled.

Figure 3: Scaling in all regions of teeth.

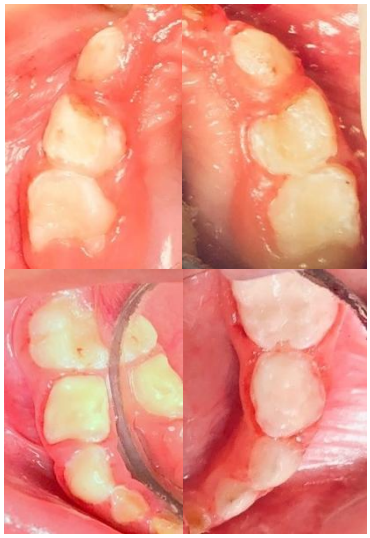

Figure 4: Intra-oral photos of a patient's teeth after polishing the restoration.

Figure 5: Local anesthesia on the anterior teeth

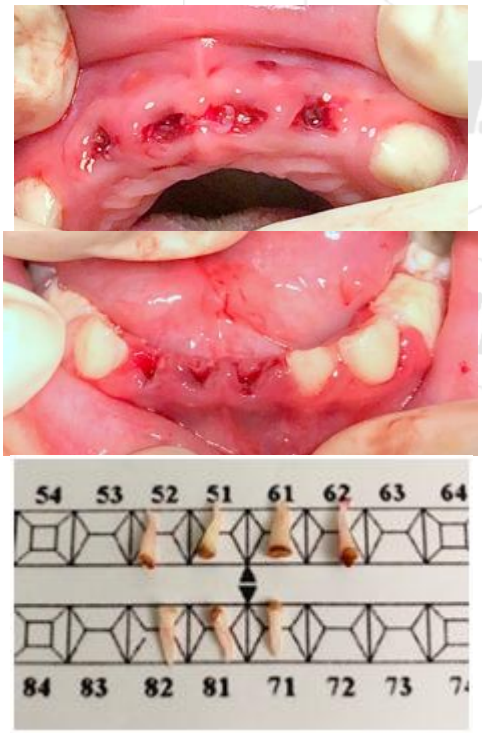

Figure 6: Clinical photographs after extraction

The next step is extracting teeth 52, 51, 61, 62, 71, 81, 82 with the addition of local anesthesia using 2% lidocaine to control post extraction bleeding (figure 5). Topical application of hemi seal is given after the tooth has been extracted to control bleeding time (figure 6). The intra-oral condition is re-evaluated after the entire procedure is completed to ensure that the oral cavity is in good condition before the patient is transferred to the recovery room.

The post-operative control visit is held on 7 days after. The results of the examination on the patient's oral cavity looks good. Injury after extraction appear normal, no swelling, and no bleeding (figure 7). Restoration in all regions appears to be in good condition, but there is a small amount of new plaque on a number of tooth surfaces. This condition can be fairly reasonable because of motoric limitations and the age of patients who are still too young, so rely on parents to maintain the dental and oral health care.

Figure 7: Clinical photographs of post-operative control visit

4. Discussion

Cerebral Palsy (CP) has a characteristic that is very easy to observe, there is the presence of a disturbance or limited motoric movement in patients, which occurs since the time of growth and development. The severity of disturbance and clinical symptoms of the affected limb in CP patients depends on the extent and location of central nervous system damage that can vary from mild to severe. Patient with CP have a history of seizures, mental retardation, behavioral or emotional problems, and hearing and vision problems, which can have an impact on the process of growth and development in terms of speech and learning abilities.[9,14]

The patient with CP type spastic cannot control the desired movement (motoric abilities), has a hyperactive reflex, and often had seizures that cause their extremities cannot be used normally. These conditions will make the dental treatment and oral health care being so difficult to be performed by a dentist. The spastic quadriplegia type is the most severe compared to the other types, because of the broader brain damage or can be due to brain malformations. In this type, the four extremities of the body, trunk and muscles that control the mouth, tongue and pharynx are involved. Patient with CP of this type have stiff extremities but have a negative neck attitude. In general, patient have limitation in walking and speaking, and also often have epilepsy that difficult to be controlled, and also an ischemic hypoxic encephalopathy.[9]

Irreversible brain damage causes uncontrolled movements such as head movement, spontaneous biting when anything inserted into the mouth, tongue rejecting, choking, swallowing, contraction of the facial muscles, tongue and tightened lips, so it is really hard to access the oral cavity.[2,15] Dentine caries in CP patients is more common than in normal children. The cause of caries is a buildup of food debris due to the inability of children with CP to clean their own teeth. The ability to cleanse the tongue, lips, and cheeks is generally low, coupled with the difficulty of swallowing and drooling, so it can make things worse. Vitamin and nutritional deficiency conditions that occur in patients with CP can cause food debris and deposits of calculus to accumulate around the cervical of teeth so this patient need to have scaling before filling.[14,16] As many as 25% of children with CP type spastic quadriplegia need total care; at most only 3% can walk and generally only occurs after the age of 3 years. Intellectual function is related to the severity of CP and the impact of the bulbar muscles that will increase the difficulty in treatment. Trunk hypotonia with pathological reflex or persistent stiffness shows the poor condition of the patient.[1]

Medical treatment of CP children is very individual, in accordance with the clinical conditions of each patient and requires a multidisciplinary approach. The treatment goals is to minimize further deformity, improve function and deal with problems related to both the patient's motoric, mental and intellectual conditions. The general health conditions of CP patients need to be known before doing treatment including the type of medication and the types of limitations that occur in patient's daily life. A multidisciplinary approach requires good communication and management between paediatricians, surgeons, therapists, growth communities, education teams, and other health teams.[4]

Dental treatment with general anaesthesia can be used as the last solution for providing dental and oral health care for the patient with CP. General anaesthesia can only be done by anaesthesiologists in the operating room equipped with respiratory and heart monitors. For patients who are not cooperative regarding motoric limitations as in CP patients, the use of general anaesthesia is still the best choice so far. The condition of patients who are under the influence of general anaesthesia can be monitored closely by the anaesthetist team, while the dentist team can focus on treating the patient's oral cavity.[9,17]

5. Discussion

Management of dental and oral health care in CP patients should be done with a multidisciplinary and comprehensive manner for the optimum treatment results. Dental treatment under general anaesthesia is the best choice that can be given to CP patients, because of the physical and mental limitations of CP patients.

References

[1] Saharso D. Cerebral Palsy Diagnosis dan Tatalaksana. Surabaya: Open Urika Creative Multimedia and Presentation Division; 2006.
[2] Scully C, Dios PD, Kumar N. Special Care in Dentistry. Philadelphia: Churchill Livingstone Elsevier; 2007.
[3] Rizky O. Penatalaksanaan Fisioterapi pada Cerebral Palsy Spastic Quadriplegi Et Causa Microcephalus di Griya Fisio Bunda Novy Yogyakarta. Universitas Muhammadiyah Surakarta. Universitas Muhammadiyah Surakarta; 2017.
[4] Jan MMS. Cerebral Palsy: Comprehensive Review and Update. Ann Saudi Med. 2006;26(April):123–32.
[5] Nowak AJ. Dentistry for the Handicapped Patient. Saint Louis: Mosby Company; 1976. 32-35 p.
[6] Dorland N. Kamus Kedokteran Dorland. 28th ed. Buku Kedokteran EGC; 2005.
[7] Ayu Y. Penatalaksanaan Fisioterapi pada Kasus Cerebral Palsy Spastik Quadriplegi Tipe Ekstensi di Yayasan Sayab Ibu Yogyakarta. Universitas Muhammadiyah Surakarta. Universitas Mugammadiyah Surakarta; 2015.
[8] Rosenbaum P, Paneth N, Leviton A, Goldstein M, Damiano D, Dan B, et al. A Report: The Definition and Classification of Cerebral Palsy. 2007.
[9] Oewen RR, Wiradidjadja A, Sjarif WS. Harapan Bagi Palsi Serebral Kesehatan Gigi dan Mulut. 1st ed. Bandung: P.T Alumni; 2012. 8-73 p.
[10] Nugraheni I, Lailatif N. Faktor Predisposing Keterlambatan Perkembangan pada Anak dengan Cerebral Palsy di RSJD Dr. RM. Soedjarwadi Provinsi Jawa Tengah. J Ilm Rekam Medis dan Inform Kesehat. 2015;5(1):1–12.
[11] Miller F, Bachrach SJ. Cerebral palsy: A complete guide for caregiving. JHU Press; 2017.
[12] Fennell EB, Dikel TN. Cognitive and neuropsychological functioning in children with cerebral palsy. J Child Neurol. 2001;16(1):58–63.
[13] Russman BS, Ashwal S. Evaluation of the Child with Cerebral Palsy. Semin Pediatr Neurol. 2004;11(1):47–57.
[14] Udi R. Multiple Ekstraksi Gigi pada Anak Penderita Cerebral Palsy. Sains Med. 2009;1(1):92–9.
[15] Krigger KW. Cerebral Palsy: An Overview. Am Fam Physician [Internet]. 2006;73(1):91–100. Available from: http://media.kenanaonline.com/files/0017/17278/cerebral palsy.pdf
[16] Reilly S, Skuse D, Poblete X. Prevalence of feeding problems and oral motor dysfunction in children with cerebral palsy: A community survey. J Pediatr. 1996;129(6):877–82.
[17] Welbury R, Duggal M, Hosey MT. Paediatric Dentistry. 4th ed. Oxford; 2012. 394-411 p.

Author Profile

Ruth Christiana Juwitaningrum (Indonesia) received DDS from Trisakti University in 2012. She continued to specialist program in Pedodontics in Universitas Padjadjaran since 2016 and graduated in 2019.

Arlette Suzy Setiawan (Indonesia) received DDS from Padjadjaran University in 1995She continued to specialist program in Pedodontics in Padjadjaran Universityand graduated in 2005. She finished her doctorate degree fromPadjadjaran University in 2012. She is a Professor inDepartment of Pediatric Dentistry ofFaculty of Dentistry, Padjadjaran University.