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From Fear to Cheer: General Anaesthesia and Parental Support for Dental Treatment in a 14-Year-Old Patient with Global Developmental Delay

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Abstract: Adolescents with global developmental delay (GDD) face significant barriers to dental care due to behavioral challenges and sensitivity to clinical environments, often necessitating general anesthesia (GA) for effective treatment. This case report presents a multidisciplinary approach that integrates GA and active parental involvement in the management of a 14-year-old girl with GDD, who exhibited extensive dental caries and generalized gingivitis. With an IQ of 25 and a negative Frankl behavior rating indicating limited cooperation, in-office procedures were deemed unfeasible. The dental team devised a comprehensive GA treatment plan while counseling her parents on behavior management strategies to facilitate care at home. To alleviate anxiety during radiographic and laboratory procedures, the parents employed children's literature as a comforting distraction. The patient underwent various dental treatments under GA, including scaling, fillings, sealants, and extractions, supported by preoperative desensitization from her parents. Follow-up assessments one week and 30 days post-surgery revealed improvements in her nutrition and tooth-brushing habits, with minimal plaque observed. In conclusion, this case underscores the importance of parental empowerment and a family-centered approach in enhancing dental treatment outcomes, reducing anxiety, and promoting better long-term oral health for adolescents with developmental delays.
Keywords: general anaesthesia; parental support; global developmental delay; dental treatment; multidisciplinary approach

INTRODUCTION

Global developmental delay (GDD) is defined by significant delays in two or more developmental domains, often resulting in profound limitations in communication and cooperative ability.[1,2] The exact global prevalence of GDD remains poorly defined due to variations in diagnostic criteria and screening methodologies across different regions.[2] The management of oral health in adolescents with GDD presents a complex intersection of clinical, behavioural, and ethical challenges.

For a 14-year-old patient, these limitations are frequently compounded by sensory processing sensitivities and severe dental anxiety, which render conventional chairside treatment ineffective and potentially traumatic.[3,4] When non-pharmacological behaviour guidance fails, general anesthesia (GA) emerges as a critical modality to facilitate comprehensive oral rehabilitation.[5] Treatment during GA allows for the efficient delivery of high-quality dental care in a controlled environment, eliminating the need for physical restraints and reducing the psychological burden on the patient.[6,7] However, the treatment success is not solely dependent on the pharmacological intervention; the role of the caregiver is paramount. Parental support and preoperative counseling are essential in mitigating the "transfer of anxiety" from parent to child, which is known to influence the success of the induction process.[8,9]

Despite the clinical efficacy of GA, many parents have significant concerns regarding the safety and necessity of the procedure for children with intellectual disabilities.[10,11] Modern pediatric dentistry emphasizes a family-centered approach, where parental presence and informed support act as catalysts for a positive healthcare experience.[12,13] This case report discusses the multidisciplinary management of a 14-year-old girl with GDD, highlighting how strategic parental involvement and a well-executed GA protocol can transform a high-stress clinical scenario into a successful rehabilitative outcome.[14]

CASE REPORT

A 14-year-old girl diagnosed with GDD and an IQ of 25 visited Soewandhi General Hospital in Surabaya with the chief complaint of multiple decayed teeth. Her behavior was assessed as definitely negative according to the Frankl behavior rating scale. Upon arrival at the hospital, she groaned and refused to open her mouth (Figure 1). Due to delays in speech, language, and cognitive development, a comprehensive oral examination could not be performed optimally and should be supplemented with a panoramic radiograph. However, this patient had visited multiple clinics and attempt to conduct a radiographic examination were unsuccessful because she was uncooperative. A limited clinical examination revealed extensive dental issues on her permanent molars and maxillary incisors, along with generalized gingivitis.

Due to the patient's limited cooperation, traditional in-office dental procedures were not feasible. A comprehensive treatment plan was created that included the use of GA. The dental team also offered extensive parental guidance on behavior management strategies.

Figure 1. 14-years-old girl diagnosed with GDD

For two weeks, the parents utilized children's books to explain the upcoming procedures to help the patient became more cooperative during radiographic evaluations and laboratory exams prior to the GA. Additionally, the dental team provided instructions on oral hygiene practices to support care at home (Figure 2).

Figure 2. Parental involvement in dental health education

During the next visit, the dental team successfully conducted clinical and radiographic examinations. The findings revealed extensive caries and pulp necrosis in teeth #21, 22, 26, and 46, irreversible pulpitis in tooth #11, and deep pits and fissures in teeth #16, 15, 14, 24, 25, 27, 37, 35, 34, 44, 45, and 47 (Figure 3, 4). After obtaining the necessary consents and clearances from the pediatrics and anesthesiology departments, the child was scheduled for dental rehabilitation under chairside GA. The procedures performed under GA included scaling, composite fillings for #21, pit and fissure sealants for #16, 15, 14, 24, 25, 27, 37, 35, 34, 44, 45, and 47, extractions of #21, 22, 26, and 46, as well as the application of topical fluoride (Figure 5). At a follow-up appointment one week after the surgery, the patient's mother reported a significant improvement in nutritional intake due to the alleviation of tooth pain. A subsequent follow-up 30 days later indicated improved tooth-brushing habits and minimal plaque buildup. Three months following the dental treatment under GA, the dental team successfully provided a topical fluoride application chairside, observing a significant improvement in the patient's behavior.

Figure 3. Panoramic radiograph

Figure 4. A. Pulp necrosis #21, #22; B. Pulp necrosis #26; C. Pulp necrosis #46

Figure 5. Post-operative photograph

Informed consent was obtained from the parents at every stage of the treatment process, emphasizing their vital role in the patient's care journey.

DISCUSSION

Global developmental delay (GDD) is defined as a significant delay in two or more developmental domains, including gross motor, fine motor, cognition, speech/language, personal–social interaction, and activities of daily living.[15] Due to its heterogeneous nature, the oral manifestations and management of patients with GDD vary widely depending on the domains affected.[16] Motor impairments may lead to uncontrolled head and tongue movements, excessive salivation, and poor manual dexterity, all of which compromise oral hygiene practices and complicate dental procedures.[17] In addition, deficits in cognitive and communication abilities often limit the effectiveness of conventional behavior management techniques, making dental care delivery particularly challenging in this population.[18]

The present case illustrates these challenges in a 14-year-old patient with severe GDD (IQ 25) and definitely negative behavior according to the Frankl scale. The patient's inability to communicate verbally and refusal to cooperate prevented adequate clinical and radiographic examination at initial visits, consistent with previous reports that highlight significant barriers to dental care in individuals with severe developmental disabilities.[19,20] Even basic diagnostic procedures, such as panoramic radiography, were not feasible despite multiple prior attempts in different clinical settings. This underscores the importance of adapting both diagnostic and treatment approaches to the patient's functional capacity.[21]

Given the extent of dental disease, including multiple teeth with pulp necrosis and irreversible pulpitis, and the patient's inability to tolerate routine dental care, comprehensive treatment under GA was considered the most appropriate option. General anesthesia enabled full-mouth rehabilitation in a single session, ensuring both patient safety and treatment efficiency.[22] This approach is well-supported in the literature for patients with severe cooperation limitations, where conventional or pharmacological behavior management techniques are insufficient.[23,24]

A key distinguishing aspect of this case, however, is the significant role of parental engagement in facilitating successful treatment outcomes. Prior to treatment, the dental team implemented an intensive parental guidance strategy, recognizing that the patient's severe communication limitations necessitated caregiver-mediated preparation. Over a two-week period, the parents actively participated in behavioral desensitization by using children's books and repeated explanations to familiarize the patient with upcoming procedures. This preparatory phase proved critical, as it enabled the successful completion of both clinical and radiographic examinations during subsequent visits—an outcome that had previously been unattainable.[25,26] This finding highlights how parental involvement can effectively bridge communication gaps and enhance patient cooperation, even in cases with severe developmental impairment.[27]

Furthermore, parental engagement extended beyond preoperative preparation to include active participation in home-based oral health care. The dental team provided tailored oral hygiene instructions, which were consistently reinforced by the parents. As a result, notable improvements were observed postoperatively, including reduced plaque accumulation and better tooth-brushing habits at the 30-day follow-up.[28] Additionally, the patient's mother reported improved nutritional

intake following the alleviation of dental pain, indicating a positive impact on overall quality of life.[29] These outcomes emphasize that parents serve as primary agents of behavioral reinforcement and oral health maintenance, particularly in patients who are unable to independently perform daily oral care.[30]

The role of parents was also critical in clinical decision-making and treatment acceptance. Informed consent was obtained at every stage, reflecting a collaborative approach between the dental team and the caregivers. The parents' understanding of the risks and benefits of GA, along with their trust in the clinical team, facilitated timely intervention and prevented further deterioration of oral health.[31] This is particularly important, as delayed treatment is commonly reported in special needs populations and is associated with more complex disease progression and poorer prognosis.[4]

Interestingly, behavioral improvement was observed at the three-month follow-up, during which the patient was able to tolerate chairside fluoride application. While general anesthesia addressed the immediate treatment needs, this gradual improvement in cooperation may be attributed in part to continued parental reinforcement and positive conditioning at home. This suggests that parental engagement not only supports immediate treatment success but may also contribute to long-term behavioral adaptation in dental settings.[32]

In comparison to other reports where children with mild GDD can be managed using behavioral techniques, physical restraint, or oral sedation, the severity of impairment in this case necessitated GA.[22] However, the success of the intervention was not solely dependent on the use of anesthesia but rather on the synergistic effect of comprehensive clinical planning and strong caregiver involvement.[33]

In summary, while GA remains an essential modality for managing uncooperative patients with severe GDD, this case highlights that parental engagement is a cornerstone of successful dental care. Active caregiver involvement in preoperative preparation, decision-making, and postoperative maintenance significantly enhances treatment outcomes, improves patient cooperation over time, and contributes to better overall oral health and quality of life.

CONCLUSION

This case demonstrates the vital collaboration between dental professionals and families in managing patients with GDD. It underscores the importance of parental involvement in dental care, showing that a multidisciplinary, family-centered approach enhances treatment outcomes, reduces anxiety, and promotes long-term oral health.

Conflict of Interest

The authors declare no conflict of interest

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