

Rehabilitation of Mandibular Dentition Under Conscious Sedation In A Pediatric Patient: a case report

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ABSTRACT:

Behavior management of younger children during dental treatment always has been a major challenging task for a pediatric dentist. The requirement of advanced behavior guidance techniques in the management of lacking cooperative behavior child is undeniable. Conscious sedation is considered to be one of the best suitable methods for delivering dental treatment in younger children. The procedure exhibits multiple advantages like extensive treatment in a single visit, aids in delivering optimum dental treatment, and prevention of developing psyche of a child. The combined use of pharmacological agents increases the potency of sedation as well as is associated with an analgesic, anxiolytic and amnesic effect. This report represents the first dental pediatric conscious sedation case in Bangladesh in 5.5 years old, anxious, and lacking cooperative behavior child.

KEY WORDS: Advanced Behavior Management, Conscious Sedation, Dental treatment, Moderate Sedation, Pediatric patient.

INTRODUCTION:

The optimum behavior management of very young children during dental treatment always has been a controversial issue.¹ If the basic behavior guidance technique does not comply with the child then the advanced techniques can aid in the situation.² The advanced behavior guidance techniques includes protective stabilization, conscious sedation and general anesthesia.¹ The treatment under conscious sedation and general anesthesia are indicated for extensive amount of work, lacking cooperative behavior, anxious child or immature cognitive level patients.³ Conscious sedation or moderate sedation is a depressed level of consciousness induced by pharmacological agent in which patient can respond to verbal command, tactile stimulations and are able to maintain airway independently.⁴ Treatment under conscious sedation not only aids in delivering necessary dental treatment, but also associated with improve future behavior of the child.¹ The various sedative agents and combinations can be used to induce conscious sedation in pediatric patient and that may be administered by oral, inhalation, intravenous, intramuscular, submucosal or rectal route, depends on operator's choice.⁵ The commonly used sedative agents for pediatric conscious sedation are benzodiazepines, nitrous oxide, antihistamines, opioids, chloral hydrate, propofol or ketamine.⁶ Monitoring of vital statistics of child like oxygen saturation, pulse rate, pulse strength, respiratory frequency and tissue color are mandatory during conscious sedation procedure.⁷ During the operative procedure, the clinician must need to be aware about over sedation in order to avoid undesirable consequences.⁸ The study reports a case of pediatric conscious sedation of healthy female child undergoing dental treatment.

CASE REPORT:

A 5.5 years old healthy female child (weight-17.5 kg) visited with the chief complaint of pain on lower posterior tooth in a private dental clinic of Dhaka, Bangladesh. The child

represents an anxious and lacking cooperative behavior. The child had a history of tooth filling on correspondent tooth associated with pain from another dental clinic. The clinical examination was undertaken and number of affected tooth was noted in Federation Dentaire Internationale (FDI) notation. During the clinical examination a treatment filling was detected on 75, cavity on 74, deep pit on 84 and active carious lesion on 85. The treatment plan was made- single visit pulpectomy followed by stainless steel crown (SSC) on 75, SSC on 85, preventive resin restoration (PRR) on 74 and dental sealant application on 84 followed by fluoride varnish application. As the extensive amount of treatment is required, the child was physically examined for the purpose of conduct treatment under conscious sedation. The child was classified as class-I category according to physical status classification of the American Society of Anaesthesiologists (ASA).⁹ A thorough history of the child was undertaken regarding any previous medical conditions, hospitalizations or drug allergy. The child was considered as suitable for treatment under conscious sedation and informed consent of the parent was taken. For the ease of treatment the active carious lesion was arrested using silver diamine fluoride and the discoloration was covered with flowable composite at the same visit. A separator was placed mesial to the both primary molars in order to achieve linear space that aid in SSC accumulation. The appointment for treatment under conscious sedation was set and parents were instructed to maintain pre-operative fasting for 4 hours.



Figure 1: Preoperative Photograph

At the day of operation, the child was visited along with the mother and health status of child was re-confirmed. Prior to treatment, the patient received no liquid for 2 hours and no meals for 4 hours. The combined oral sedative agents- diazepam and promethazine were administered according to the body weight of the child in order to induce conscious sedation. After 30 minutes following administration of oral sedative agents the child was taken to dental operatory for treatment purpose. The preoperative photograph (Fig. 1) was

taken and nitrous oxide was delivered (Fig. 2) using the nasal mask in order to increase the potency of sedation. The concentration was maintained on 70% oxygen and 30% nitrous oxide by volume during the pulp treatment and tooth preparation for SSC only.



Figure 2: Nitrous oxide- oxygen delivering unit

Following the invasive procedure nitrous oxide was withdrawn and placement of PRR and dental sealant was done. Post-operative photograph (Fig. 3) was taken followed by fluoride varnish application. The time taken for the complete procedure was approximate 55 minutes. During the treatment procedure the oxygen saturation, heart rate, respiratory frequency and skin color was monitored continuously and the status recorded in every 5 minutes. The child was discharged as soon as she met the required criteria.⁶



Figure 3: Post-operative radiograph

DISCUSSION:

The objectives of conscious sedation in pediatric patients are managing anxiety, minimize discomfort, reduce psychological trauma and delivering good quality dental treatment.² In this case combined oral sedative agents were used along with the nitrous oxide- oxygen inhalation agent which was effective for completion of extensive treatment. It was previously reported that, the use of combined sedative agents are safe and effective for the treatment of pediatric population.^{5,10} As the sedatives agents can be administered in multiple way, it is beneficial for the special child, medically compromised child or handicapped patient.^{11,12} Although some delirium was reported in adult patient but no case of pediatric patient was reported.¹³ Previous study by Ilasrinivasan (2018), also reported that, the combined use of sedative agent can results in successful outcome.⁵ The treatment under conscious sedation can be successful in up to 90%, if the patients are selected carefully.³ Study by Antunes stated that, the dental treatment under conscious sedation results in improved behavior in child patient. He also added, "moderately sedated children showed better prospective behavior than those in the non-sedation group."¹ The child was monitored very carefully throughout the treatment procedure. Finger pulse oximeter was used to record oxygen saturation, heart rate, and pulse strength while respiratory frequencies and skin color was monitored by visual observation. Whenever any discrepancy in reading arises, the treatment was stopped for a moment until vital signs returns to its normal parameter. The supplemental oxygen and emergency drugs were prepared before initiating operative procedure. No major deviation was recorded during the procedure. All of the sedation team personnel were aware about sedation monitoring guideline.¹⁴ The nitrous oxide-oxygen volume was maintained 70% oxygen and 30% nitrous oxide which is recommended level of use in pediatric patient.⁶ The amount of work, physical condition of the child and parental concern is the major considerations during selection of advanced behavior guidance technique.³ In this case conscious sedation modality was selected considering these factors.^{3,4} The vital parameters were taken before administration of any sedative agents and the reading taken in concern during discharging of the patient. No complications were recorded after 24 hours and 1 week follow-up. The conscious sedation seems to be valuable treatment modality to reduce suffering of very younger children.

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REFERENCES:

1. Antunes DE, Viana KA, Costa PS and Costa LR. Moderate sedation helps improve future behavior in pediatric dental patients - a prospective study. *Braz Oral Res.* 2016; 30(1): e107. <https://doi.org/10.1590/1807-3107BOR-2016.vol30.0107> PMID:27783767
2. American Academy of Pediatric Dentistry. Behavior guidance for the pediatric dental patient. *The Reference Manual of Pediatric Dentistry.* Chicago, Ill.: American Academy of Pediatric Dentistry; 2021:306-24.
3. Silva CC, Lavado C, Areias C, Moura J, Andrade D. Conscious sedation vs general anesthesia in pediatric dentistry - a review. *Medical Express (São Paulo, online).* 2015; 2(1): M150104. <https://doi.org/10.5935/MedicalExpress.2015.01.04>
4. Veeramachaneni S, Dande S, Khan MM, Kumar DS, Verma S, Parhad P. Case Preferences In Choosing Conscious Sedation Versus General Anesthesia Amongst Pediatric Dentists: A Research Survey. *European Journal of Molecular & Clinical Medicine.* 2021; 8(1): 1252-1257.
5. Ilasrinivasan, Setty JV, Shyamachalam, Mendiretta P. A Comparative Evaluation of the Sedative Effects of Nitrous Oxide-oxygen Inhalation and Oral Midazolam- Ketamine Combination in Children. *Int J Clin Pediatr Dent.*, 2018; 11(5):399-405. <https://doi.org/10.5005/ip-journals-10005-1547> PMID:30787553 PMCID:PMC6379538
6. Hallonsten A-L, Jensen B, Raadal M, Veerkamp J, Hosey M& Poulsen S. EAPD Guidelines on Sedation in Paediatric Dentistry (2007).
7. Crosswell RJ, Dilley DC, Lucas WJ and Vann WF Jr. A comparison of conventional versus electronic monitoring of sedated pediatric dental patients. *Pediatr Dent.* 1995; 17(5):332-9.
8. Canfield DW, Reiber KC, Bennett R. Oversedation in a pediatric patient: case report. *Pediatric Dentistry.* 1987; 9 (3): 229-231.
9. Doyle DJ, Goyal A, Garmon EH. American Society of Anesthesiologists Classification. [Updated 2021 Oct 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan
10. Bourke M, Mac Giolla Phadraig C. Nitrous oxide versus midazolam for paediatrics. 2018; 64 (2): 88-95.
11. Miyauchi M, Hama Y, Ono S and Takechi M. Intranasal midazolam conscious sedation for dental surgery in child with left ventricular noncompaction. *Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology.* 2021; 33: 165-168. <https://doi.org/10.1016/j.ajoms.2020.09.014>
12. Jo CW, Park CH, Lee JH and Kim JH. Managing the behavior of a patient with autism by sedation via submucosal route during dental treatment. *J Dent Anesth Pain Med.* 2017;17(2):157-161. <https://doi.org/10.17245/jdapm.2017.17.2.157> PMID:28879345 PMCID:PMC5564151
13. Mohri-Ikuzawa Y, Inada H, Takahashi N, Kohase H, Jinno S and Umino M. Delirium during intravenous sedation with midazolam alone and with propofol in dental treatment. *Anesth Prog.* 2006; 53(3):95-7. [https://doi.org/10.2344/0003-3006\(2006\)53\[95:DDISWM\]2.0.CO;2](https://doi.org/10.2344/0003-3006(2006)53[95:DDISWM]2.0.CO;2)
14. Coté CJ, Wilson S. American Academy of Pediatric Dentistry, American Academy of Pediatrics. Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures. *Pediatr Dent* 2019; 41(4):E26-E52. <https://doi.org/10.1542/peds.2019-1000> PMID:31138666

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