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Comprehensive Dental Management under General Anesthesia in a 16-Year-Old Male with Autism Spectrum Disorder: Case Report and Narrative Review

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Abstract
Autism spectrum disorder (ASD) is a neurodevelopmental condition marked by persistent deficits in social communication and restricted or repetitive patterns of behaviour. Children and adolescents with ASD often show atypical sensory responses, which can complicate oral health care. Conventional dental treatment may become difficult when the child cannot understand or follow instructions and becomes overwhelmed in the operatory. This article presents a case of comprehensive dental management under general anaesthesia in a 16-year-old male with ASD who was unable to cooperate for routine chairside treatment. A narrative review is also provided, focusing on oral health challenges, behaviour guidance strategies, sensory modification, pharmacologic support, and interdisciplinary care for children with ASD in the dental setting.

Keywords: Autism spectrum disorder, general anaesthesia, behaviour guidance, special health care needs, pediatric dentistry, desensitization.

Introduction

Autism spectrum disorder is a lifelong neurodevelopmental condition with wide clinical variability. Core features include difficulties in social communication and interaction together with restricted, repetitive behaviours. Many children with ASD also exhibit atypical sensory processing, such as hyper- or hypo-responsiveness to sounds, light, taste, and touch. These features directly influence dental care because routine procedures depend on communication, predictability and tolerance of multiple sensory stimuli. [1–3]

Children with ASD are at increased risk for poor oral health and unmet dental needs. Difficulties with toothbrushing, aversion to toothpaste flavours, and resistance to oral hygiene routines can lead to plaque accumulation and caries. [4] Caregivers may struggle to maintain daily oral hygiene because of behavioural resistance and challenges in motor planning. [5] Several studies report higher treatment needs under general anaesthesia and more severe disease at the time of presentation, even when caries experience indices are similar to neurotypical controls. [6–8]

Barriers to dental care are multifactorial. They include patient factors such as sensory overload, anxiety, and limited communication, and system factors such as long waiting times, unfamiliar environments, and inadequate training of dental staff. Qualitative and mixed-methods reviews highlight affordability, accessibility, sensory sensitivities, and the attitudes and knowledge of dental professionals as key determinants of access for autistic children and adolescents. When routine care fails, advanced behaviour guidance including sedation or general anaesthesia may be required to provide safe and effective treatment.

The present article describes comprehensive dental rehabilitation under general anaesthesia in a 16-year-old male with ASD who could not follow basic instructions and was uncooperative in the dental chair. This is followed by a narrative review on ASD and the dental management of these children.

Case report

Patient information

A 16-year-old male with a known diagnosis of autism spectrum disorder since birth reported to the Department of Pediatric and Preventive Dentistry with a chief complaint of pain and sensitivity in the lower left back tooth region for the past three to four months. The parents reported that the patient was under regular follow-up with pediatric, general medicine, and neurology departments for ASD management. No systemic comorbidity or contraindication to general anaesthesia was documented in the case notes.

The child was unable to follow even basic instructions during dental consultation and did not cooperate for conventional chairside treatment. Attempts at routine behaviour guidance were unsuccessful. The clinical behaviour suggested severe communication limitation and sensory defensiveness consistent with ASD.

Clinical findings

Intraoral examination revealed gross decay in relation to tooth 36 with tenderness on percussion. Occlusal caries was present in teeth 46 and smooth surface caries in 53. Teeth 63 and 73 showed mobility compatible with physiologic root resorption, and the permanent successors were visible intraorally.

Based on these findings, a provisional diagnosis of chronic irreversible pulpitis in 36, dental caries in 46 and 53, and physiologic exfoliation of 63 and 73 was made. Because a complete chairside assessment and treatment were not feasible, a plan for comprehensive dental management under general anaesthesia was discussed with the parents and the medical team.

Treatment planning and preanesthetic assessment

Repeated conventional chairside attempts failed because of absent cooperation and sensory problems. After informed consent and multidisciplinary consultation, comprehensive dental treatment under general

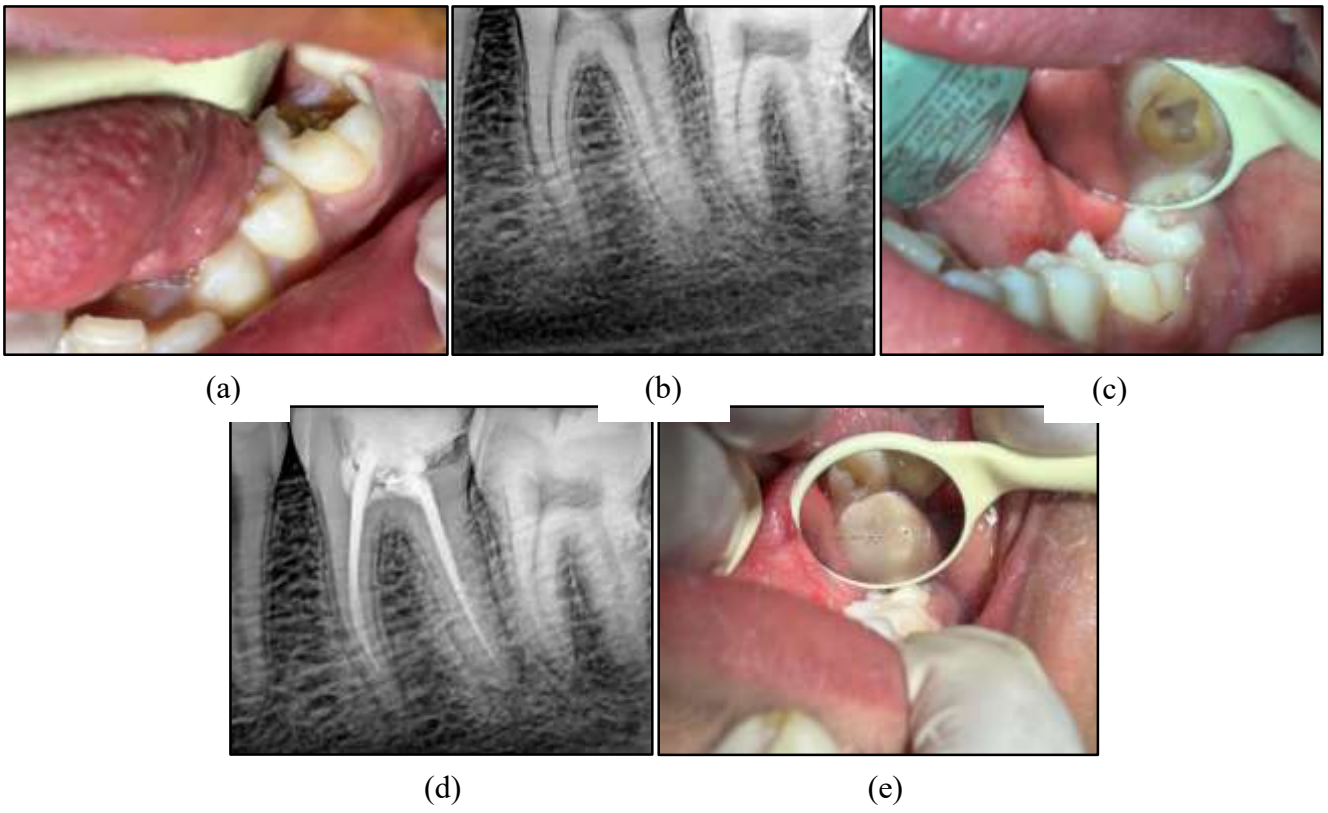
anaesthesia was planned. Preanesthetic evaluation showed hematologic and systemic parameters within normal limits, and medical clearance was obtained from paediatrics, general medicine, and neurology.

Treatment under general anaesthesia

The procedure was carried out in the operating theatre under standard monitoring by an anaesthetist. After Naso-endotracheal intubation, the following procedures were completed in a single session: single-sitting root canal treatment in 36 followed by composite restoration (Figure 1), composite restoration in 46 (Figure 2), glass ionomer restoration in 53, and extraction of 63 and 73 (Figure 3) due to physiologic mobility and eruption of permanent successors.

Haemostasis was achieved at all sites. The child recovered uneventfully from general anaesthesia, and no intra- or postoperative complications were noted. Postoperative instructions regarding oral hygiene and diet were explained to the parents at the time of discharge and the patient was asked to report for follow-up after 15 days.

Figure 1: Single-sitting RCT irt 36 (a) Intra-oral pre-operative view (b) Pre-operative IOPAR (c) Access opening (d) Post-operative IOPAR with obturation and coronal restoration (e) Post-operative intra-oral view



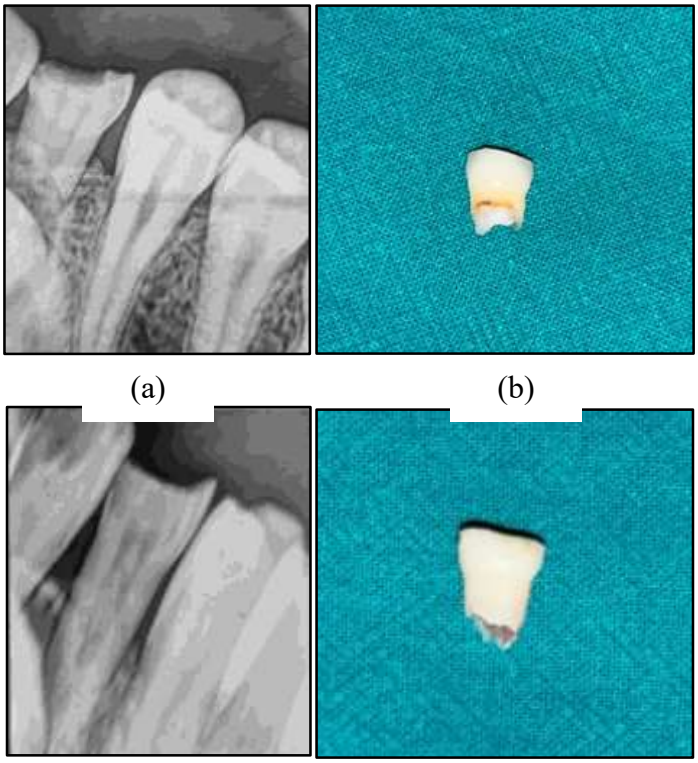
(a) (b) (c)

(d) (e)

Figure 2: Composite restoration irt 46 (a) Intra-oral pre-operative view (b) Composite restoration

(a) (b)

Figure 3: Extraction irt 73 and 83 (a, c) Pre-operative IOPAR irt 73, 83 (b,d) Extraction 73, 83



(a) (b)

(c) (d)

Discussion

Case discussion

Dental treatment in children with ASD can be challenging because the clinical environment contains multiple sensory triggers such as bright lights, sounds, tastes, smells, and tactile stimuli. [1–3] Difficulties in social communication and resistance to change further limit understanding of instructions and tolerance of invasive procedures. [9-11] The present case illustrates a situation where a child with ASD could not follow basic commands and routine chairside care was not possible despite repeated attempts.

Evidence shows that autistic children frequently require dental treatment under general anaesthesia when behaviour severely limits cooperation.[6–8,12,13] Analyses of hospital records indicate that many children with ASD receiving dental care are treated under GA and often need extensive restorative and endodontic procedures in a single session.[6–8] One cohort reported that most ASD children undergoing dental GA had heavy treatment loads per visit and a considerable proportion needed repeat GA sessions. Comparative

studies further show that children with ASD often present with more complex treatment needs and higher rates of uncooperative behaviour than neurotypical controls.

Recent work examining perioperative outcomes has highlighted that children with ASD may experience higher rates of perioperative complications during dental GA, including emergence agitation and minor cardiovascular events, although overall morbidity remains acceptable in well-selected cases. These findings emphasize the importance of detailed medical assessment, individualized anaesthetic planning, and close intraoperative monitoring for patients with ASD. In the present case, general anaesthesia allowed completion of all required procedures in one session and avoided multiple distressing visits, which is consistent with reported advantages of GA in severely uncooperative children. [6–8,12,13]

Guidelines from the American Academy of Pediatric Dentistry classify general anaesthesia as an advanced behaviour guidance option for selected patients, including those with special health care needs, when conventional approaches fail to provide safe and effective treatment. The guidelines stress careful case selection, informed consent, and collaboration with medical specialists when significant comorbidities are present. [14] Multidisciplinary coordination between pediatric dentistry, medicine, neurology, and anaesthesiology, as undertaken in this case, aligns with recommendations that complex ASD cases be managed through an integrated team-based approach.

Oral health challenges in ASD

Children with ASD face distinct oral health challenges that arise from both behavioural and sensory factors. [1–3] Narrative and systematic reviews indicate that many autistic children struggle with routine toothbrushing due to aversion to toothpaste taste, foam, or brush texture, and may resist any manipulation of the oral cavity. Caregivers often report difficulty establishing stable oral hygiene routines, leading to plaque accumulation and increased risk of caries and periodontal problems.

Several studies suggest that oral health outcomes in ASD are heterogeneous, with some cohorts showing similar or lower DMFT scores compared with controls but higher levels of untreated disease and emergency presentations. A hospital-based analysis from China reported significant caries experience and extensive treatment needs among children with ASD treated under GA, with a large number of restorations, pulpotomies, and extractions per child. Another study found that patients with ASD were more likely to be caries-free than their peers but were also more likely to be uncooperative and to require advanced behaviour management, illustrating the complex relationship between disease status and access to care.[1,15]

Oral health inequalities in ASD are closely linked to barriers in access to dental services. Mixed-methods reviews describe factors such as affordability, transportation, scheduling difficulties, lack of autism-specific training among dental staff, and negative past experiences as major obstacles to regular preventive visits. A scoping review focusing on autistic individuals highlighted persistent barriers including fear, sensory overload, communication challenges, and inadequate service adaptations, which together contribute to high levels of unmet oral health need. These findings underscore the importance of early engagement, tailored preventive care, and proactive recall systems for children with ASD. [6]

Principles of operatory management

Successful dental management of children with ASD begins with an individualized assessment. [1–3,16] Authors recommend obtaining a detailed history from caregivers regarding communication style, preferred reinforcers, sensory triggers, previous dental experiences, medical conditions, and current

medications. This information helps the dental team to anticipate potential difficulties, adapt the environment, and select appropriate behaviour guidance strategies.

Appointment structure plays a major role in reducing anxiety for children with ASD. Short morning appointments, minimal waiting time, and a clear, predictable sequence of steps can enhance tolerance and reduce behavioural escalation. Reviews suggest that maintaining consistency in staff, operatory layout, and verbal cues helps build trust and familiarity across visits. Integrating visual schedules, countdowns, or simple "first-then" charts can further support transitions during the dental appointment. [9-11]

Communication strategies need to be clear, concise, and concrete. Basic behaviour guidance techniques such as presence of parents, tell-show-do, positive reinforcement, and differential verbal praise remain useful but often require adaptation to the child's comprehension level. Visual pedagogy, including social stories and picture exchange communication systems, can help explain dental procedures and expectations to children with limited verbal skills. Video-modeling and practice with dental scenarios in non-clinical settings have also shown promise in improving acceptance of examinations and preventive care. [9-11]

Collaboration with other professionals may enhance dental outcomes. Occupational therapists can assist in identifying sensory profiles and suggesting coping strategies for specific stimuli. Special educators or psychologists may support pre-visit preparation, reinforcement schedules, and management of challenging behaviours. Interdisciplinary coordination is particularly helpful for children with more severe ASD or intellectual disability, where complex behaviour patterns need integrated management plans.

Sensory adaptation and desensitization

Sensory adaptation of the dental environment is central to improving cooperation in children with ASD. [1–3,17] Research on sensory-adapted dental environments shows that adjustments such as dimmed lights, reduced auditory stimuli, calming music, and tactile supports can decrease distress and enhance participation during oral care. In one study, children with ASD treated in a sensory-adapted setting exhibited lower physiological stress markers and improved compliance compared with standard conditions.

Environmental modifications can be extended beyond the operatory. Recommendations include quiet waiting areas, predictable visual signage, availability of preferred sensory tools (for example, weighted blankets or fidget devices), and avoidance of strong smells that may trigger aversive responses. These elements help create a more tolerable context for children with ASD and may reduce the likelihood of behavioural meltdowns prior to treatment. [1]

Desensitization strategies are useful when urgent invasive treatment is not required. Structured programs typically involve graduated exposure to the dental environment, beginning with non-invasive steps such as entering the clinic, sitting in the chair, and touching instruments, and then progressing toward examination and preventive procedures. A two-year case review demonstrated that children with ASD who completed desensitization maintained dental skills over time and later accepted prophylaxis and fluoride varnish. A prospective study of a desensitization program found increased completion of preventive dental visits among children with ASD and improved tolerance of basic procedures.

Systematic reviews of oral care interventions for autistic individuals support combining desensitization with visual supports and caregiver coaching. These reviews note that multi-session programs using reinforcement-based teaching can gradually modify the child's response to stress-inducing factors in the dental setting. Such approaches are particularly valuable for children who are not candidates for sedation or general anaesthesia or whose families prefer behaviour-based strategies. [9-11]

Role of caregivers and preventive planning

Caregiver involvement is crucial in the dental management of children with ASD. Parents and carers are often the primary source of information regarding triggers, calming strategies, and effective communication methods. Mixed-methods evidence suggests that empowerment of caregivers and collaborative planning with dental professionals improve acceptance of dental visits and adherence to preventive regimens.

Caregivers can support pre-visit preparation by using social stories, visual schedules, or mock dental sessions at home. They also play a key role in reinforcement, offering praise or rewards for cooperative behaviour during and after visits. Reviews highlight that caregiver training in reinforcement-based desensitization and adapted toothbrushing techniques can lead to gradual improvement in oral hygiene and tolerance of routine care.

Preventive strategies should be prioritized because extensive restorative treatment under GA carries cost, risk, and logistical burden for families. [6–8,13] Recommended measures include frequent recall visits, individualized diet counselling focused on reducing fermentable carbohydrate intake, and regular topical fluoride applications. Fissure sealants and minimally invasive techniques can be used when cooperative capacity permits. Systematic reviews of interventions for autistic individuals endorse structured toothbrushing protocols, adapted brushes, and tailored toothpaste selection to match sensory preferences. Together, these strategies aim to limit disease progression and reduce the need for repeat general anaesthesia sessions. [6–8,13,19]

Pharmacologic and advanced behaviour guidance

Nonpharmacologic approaches should be attempted whenever feasible, but they may not be sufficient for all children with ASD. AAPD guidelines classify protective stabilization, sedation, and general anaesthesia as advanced behaviour guidance modalities, each with specific indications, benefits, and risks. These guidelines emphasize that the choice of modality must balance treatment urgency, patient safety, and long-term psychological impact.

Conscious sedation can support care in partially cooperative children with ASD who experience moderate anxiety yet can tolerate the dental environment with assistance. A recent review of dental conscious sedation for children with ASD reported that nitrous oxide and oral benzodiazepine regimens can reduce anxiety and improve cooperation when delivered by trained teams under appropriate monitoring. However, the review also noted variability in individual responses and underscored the need for clear protocols and careful case selection.

General anaesthesia is generally reserved for children with severe behavioural resistance, multiple treatment needs, or complex medical comorbidities that make outpatient care unsafe or ineffective.[6–8,11,13] Studies of dental GA for children with ASD show high treatment loads per session, including numerous restorations, endodontic procedures, and extractions, reflecting delayed presentation and accumulated disease.[6–8] Comparative analyses of GA outcomes indicate that ASD diagnosis may be associated with higher perioperative complication rates, although caries burden and overall health status are often stronger predictors of prolonged anaesthesia than ASD itself.

These findings highlight the importance of thorough preoperative assessment, clear communication with caregivers about risks and benefits, and robust postoperative preventive plans after GA.[6–8,11,13] Integrating advanced behaviour guidance into a broader framework that includes sensory adaptation,

desensitization, and caregiver-led prevention may help limit repeated GA usage and improve long-term oral health outcomes for children with ASD.[2,4,6–8,11,14,19-20]

Conclusion

Autism spectrum disorder poses distinct challenges for dental care because of impaired communication, restricted behaviours, and atypical sensory processing. [1–3] Many children with ASD have significant treatment needs and face barriers to preventive visits and routine care. This case illustrates that, when cooperation is extremely limited and chairside treatment fails, comprehensive dental rehabilitation under general anaesthesia can be a safe and practical solution, provided that multidisciplinary planning and careful perioperative management are in place. [6–8,11,13]

Management of children and adolescents with ASD should be individualized. Key components include detailed history taking, collaboration with caregivers, communication modification, sensory adaptation of the dental environment, and use of desensitization programs when time allows. [2–5,15,18] Advanced behaviour guidance with sedation or general anaesthesia should be considered when nonpharmacologic approaches are insufficient to provide necessary care safely. Strengthening preventive strategies and improving training of dental professionals in ASD-specific behaviour management can help reduce disparities in oral health and enhance the overall quality of life of these children and their families.

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