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Oral Rehabilitation in a Down Syndrome Patient – A Case Report

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Case Study

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ABSTRACT

Down syndrome (DS) is a common chromosomal abnormality causing mild to moderate intellectual disability and affecting multiple organs, including the orofacial region. Patients with DS may exhibit cognitive delays, making behavioral management and safety concerns for pediatric dentists. Individuals with DS are at risk for oral health problems due to their oro-facial characteristics. This article describes the chair-side management of an 11-year-old female DS patient who reported pain in the lower right back tooth region.

Keywords: Chromosome 21 Trisomy, Dentofacial Anomaly, Down Syndrome, Macroglossia, Oral Health Conditions.

Introduction

Down syndrome is a congenital anomaly characterized by unique phenotypic features and psychomotor developmental delays. It is also called as trisomy 21, trisomy G, and mongolism as it is usually caused by the presence of all or part of the third copy of chromosome 21. This condition is named after the British physician; John Langdon Down who coined and described it in 1886.[1] Features of DS can range from mild to severe. In this condition, extra genetic material may cause delays in the mental and physical development of the child. Most children with Down syndrome have IQs in the mild to moderate range of mental retardation, delayed language and motor development.[2]

Patients with DS may be stubborn, impulsive, and uncooperative in their behavior leading to the use of techniques like systematic desensitization, tell-show-do (TSD), positive reinforcement, sedation with nitrous oxide, or treatment under general anaesthesia. Poor oral health increases morbidity and adds to the health burden of caregivers of children with Down syndrome. For this reason, patients with developmental disabilities such as Down syndrome require focused, individualized, and comprehensive treatment for their oro-dental issues. This report aims to explain the chair-side management of Down syndrome patients.

Case Description

A girl with Down syndrome, aged 11 years, visited the Department of Pediatric and Preventive Dentistry complaining of pain in her lower right back tooth region for the last two weeks. Despite having poor speech skills, the patient understood given instructions and had been attending a school for children with special needs. Frankl's behavior rating scale described the child's behavior as definitely positive. Extra oral examination revealed midface hypoplasia, slanting almond-shaped eyes slanting up with prominent epicanthic folds, small ears, open mouth posture, everted lower lip, and protruding tongue (Figures 1a and 1b). The child's hands had short and stubby fingers with a single palmer crease present on the palms (Figure 1c). There was no significant family history of dental issues.

Figure: 1a Frontal facial view and 1b Lateral facial view

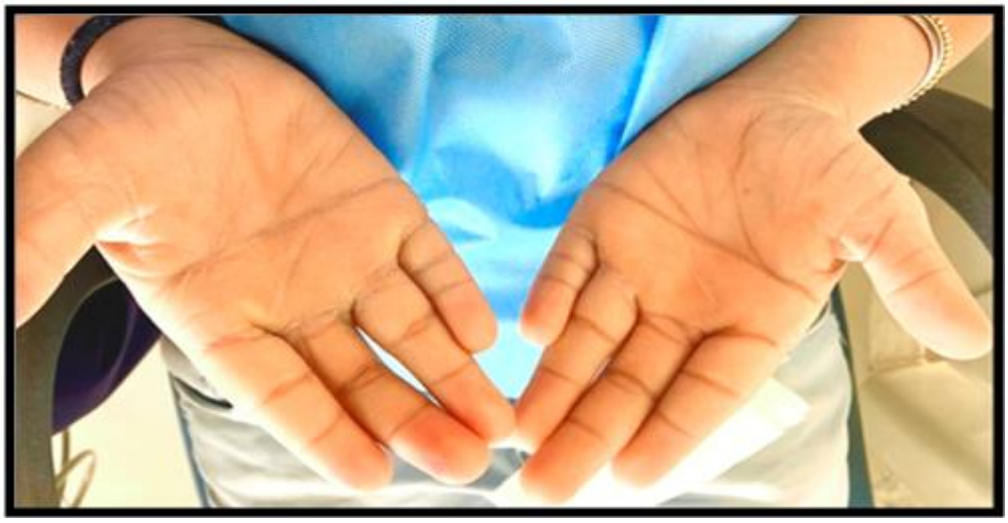

Figure: 1c Single palmer crease on palms.

Intraoral examination revealed that the patient was in a mixed dentition stage with the high-arched palate, and tongue exhibiting moderate, central transverse-type fissures and macroglossia.

The patient had root stumps in teeth 55, 65, 75, 74, and 85 and deep pits and fissures in teeth 16, 15, 14, 24, 25, 26, 36, 35, 34, and 46 (Figure 2a,2b,2c, and 2d).

Figure 2: Intraoral pre-operative images

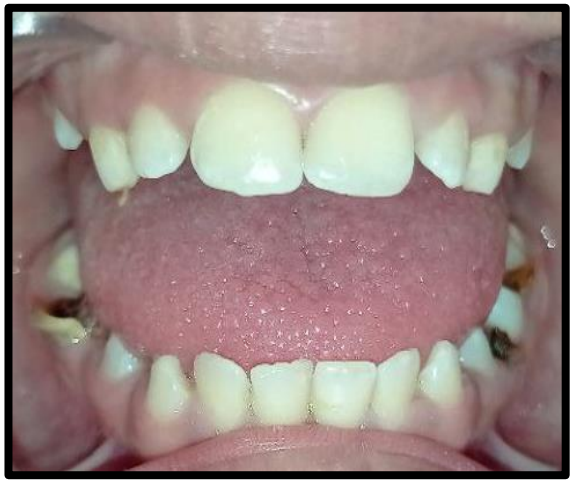

Figure 2a: Intra oral labial view

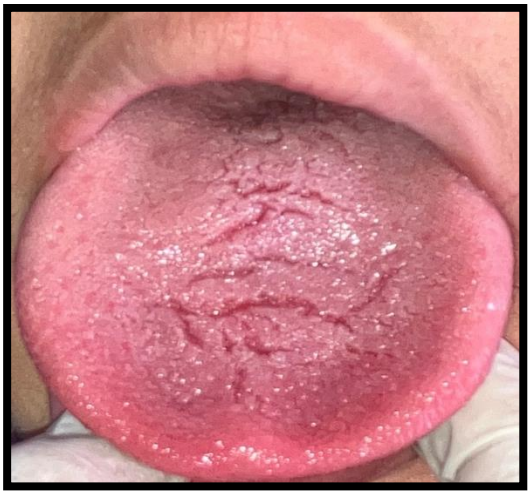

Figure 2b: Macroglosia with horizontal fissures

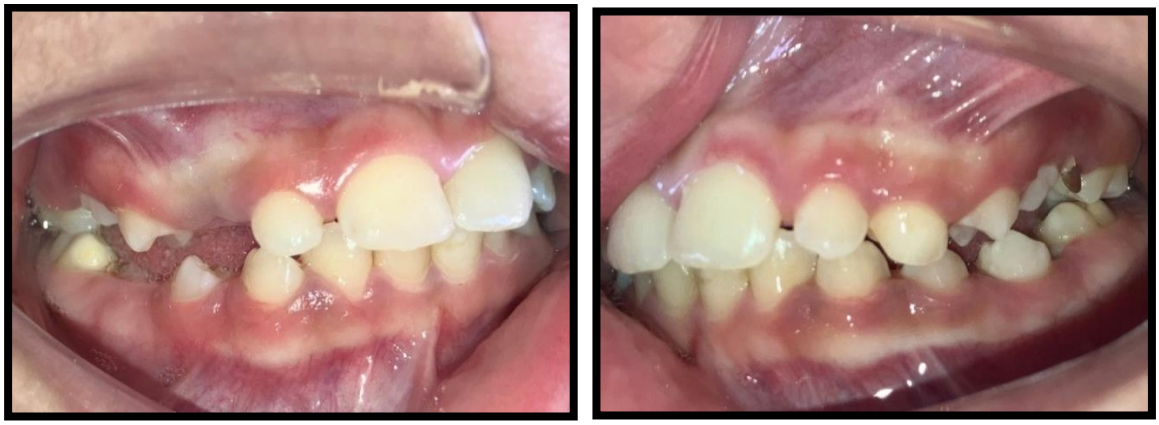

Figure 2c: Left and right intraoral lateral views.

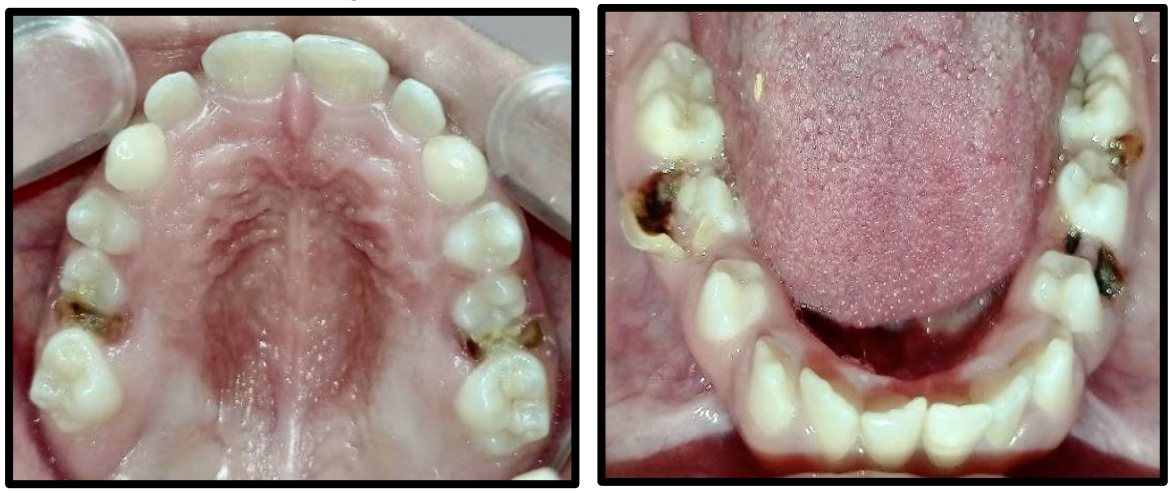

Figure 2d: Intraoral Maxilla and mandible view.

Generalized spacing was observed, but the rest of the teeth were in good condition and the patient's oral hygiene was satisfactory. The diagnosis of retained primary teeth was made based on the results of the orthopantomogram (OPG) and the deep pits and fissures observed during the intraoral examination (Figure 3).

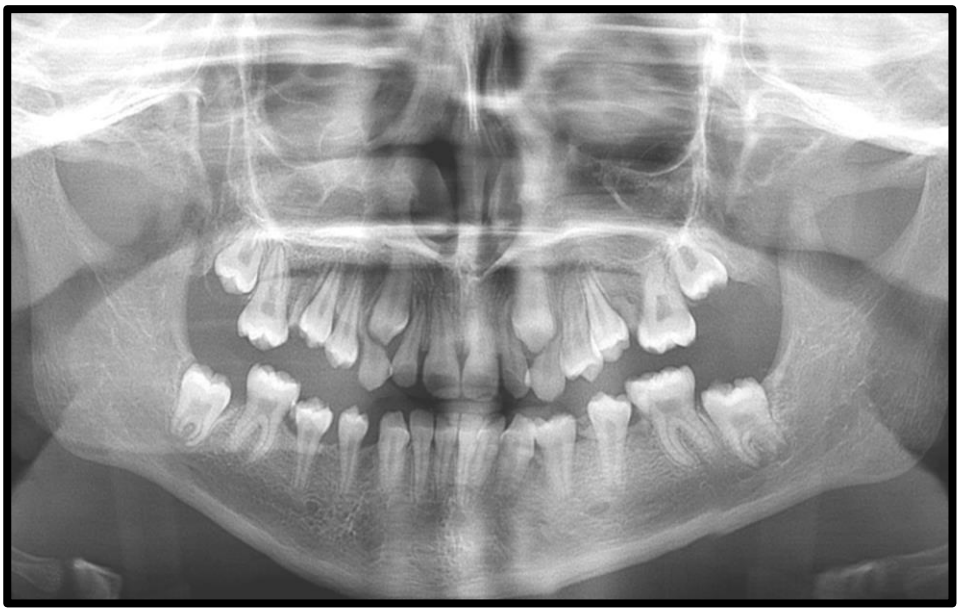

Figure 3: Panoramic radiograph of the patient.

After obtaining consent and satisfactory cooperation, local infiltration adjacent to root stumps was performed by administering 2% lignocaine with 1:80000 adrenaline. Retained root stumps were extracted using elevators and root forceps (Figure 4), followed by pit and fissure sealant and topical fluoride application. Healing was uneventful and the patient was asymptomatic with periodic recall at 1, 3, and 6 months (Figures 5a, 5b, and 5c). Behavioural reinforcement techniques were used to keep the patient comfortable.

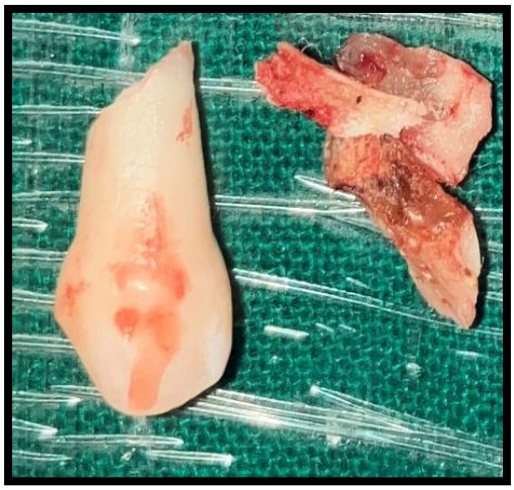

Figure 4: Clinical picture of extracted retained teeth.

Figure 5: Intraoral post-operative images after 1 week follow up.

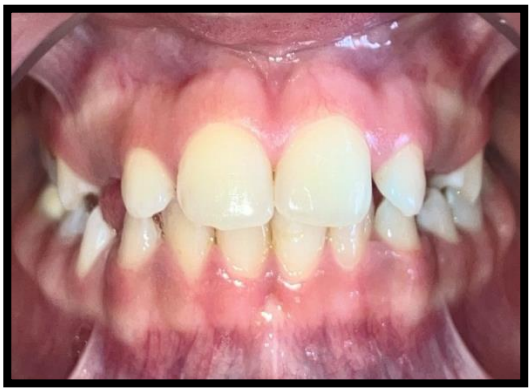

Figure 5a: Labial view

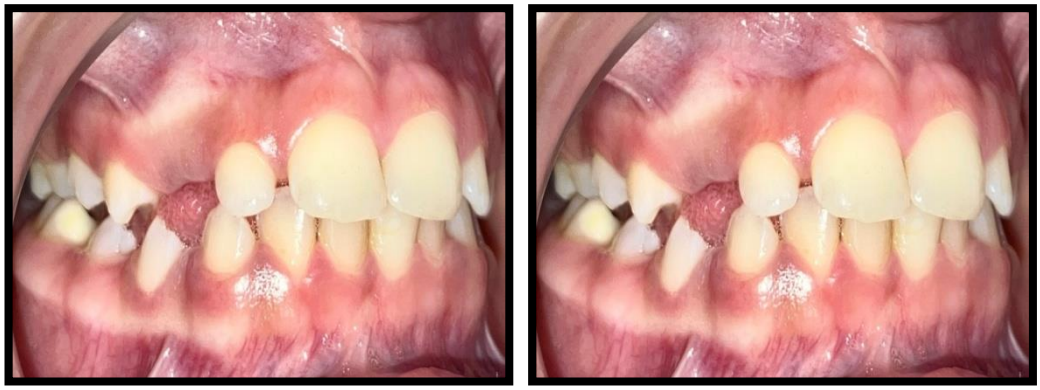

Figure 5b: Left and right lateral view.

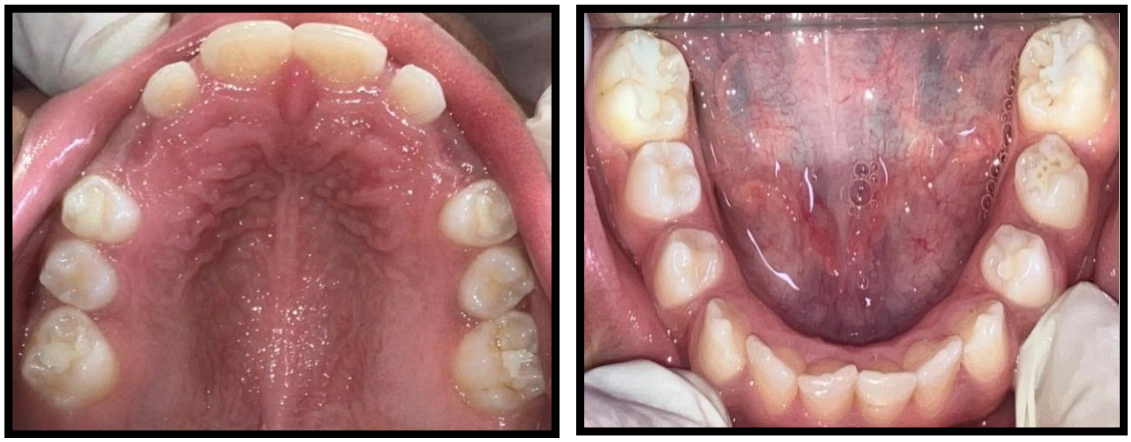

Figure 5c: Maxilla and mandible.

Discussion

Down syndrome (DS) is a chromosomal disorder affecting children across the globe. There are three genotypes of Down syndrome: trisomy 21 (94%), translocation (5%), and mosaicism (1%).[3] The incidence of Down Syndrome (DS) is linked to

increasing maternal age.[4] However, recent advancements in medical healthcare facilities and increased awareness about this syndrome have led to longer lives as well as more social involvement than before.[5]

Patients with Down syndrome often have a typical facial features including mid-facial hypoplasia, slanting eyes, flat nasal bridge, and a protruding tongue resulting in an open mouth posture. They also have underdeveloped middle third of the face, which can cause craniofacial dysplasia resulting in anterior open bite and proclination of the lower incisors, periodontal disease, and chronic respiratory infections with repercussions in mouth breathing, xerostomia. Enamel hypocalcification, fusion, twinning and decreased tooth root length, congenital oligodontia, delayed eruption of deciduous and permanent teeth, high arched palate, fissured lips and tongue, macroglossia, malocclusion, and bruxism are also present.[6] These issues may be caused by differences in oral morphology, malocclusions, decreased salivary rates, cariogenic diets and medications, bruxism, and immunological factors.[7]

It is common for individuals with Down syndrome to have retained primary teeth, with a reported prevalence of 31%, and experience spacing between the teeth in 21.6% of cases.[8] Dental caries is directly or indirectly supported by immunosuppression where microorganisms colonize and demineralize the tooth surface, leading to cavitation. Glucose-containing medications, consumed by Down syndrome patients for various health problems, may increase the incidence of caries.[9-13]

Poor oral hygiene is also a contributing factor due to muscular hypotonicity and behaviour during dental appointments.[6] In children with Down syndrome, the transition from the deciduous to the permanent dentition is slower than average. The eruption of both sets of teeth is delayed, particularly affecting the upper and lower central and lateral incisors, canines, and first molars. Eruption is not typically completed until the fourth or fifth year of life, with the permanent first molars erupting around age 8-9 years instead of 6-8 years.[14, 15]

Young patients with DS are typically gentle, spontaneous, patient, and tolerant. Additionally, they tend to have minimal physical disabilities. However, some patients may exhibit anxiety, stubbornness, and resistance to change, making dental care difficult. Techniques such as desensitization, behaviour modification, tell-show-do (TSD), positive reinforcement, voice control, mouth props, and sedation can help. Non-pharmacologic interventions like TSD can also relieve anxiety during dental treatments.[16]

In the present case, child's fear of dental procedures was managed through behavioural reinforcement techniques such as verbal and nonverbal communication, tell-show-do, euphemisms, modelling, and distractions. Due to the need for slow reinforcement, multiple short visits for extractions were preferred over a single visit. The child was particularly fearful of the dental syringe during extractions but was counselled and reassured several times.

In patients with Down syndrome, it is crucial to implement preventive measures to avoid oral health issues and address long-term consequences. Unfortunately, oral health often goes overlooked in these patients as parents focus on other health concerns. Each patient requires a tailored prevention strategy, including parental education and participation, regular dental visits beginning at 12-18 months, assistance with dietary practices, oral prophylaxis and hygiene motivation, topical fluoride application, pit and fissure sealant, and early intervention.

Conclusion

Early recognition of Down syndrome and its dental manifestations is essential for improving psychological, physiological, medical, and dental quality of life. Individuals with coexisting

intellectual disabilities often suffer from dental diseases due to poor oral health. Proper behavioral management can eliminate the need for general anesthesia while providing effective chair-side dental treatment.

Declaration of patient consent

The authors have obtained appropriate patient consent forms. Patient's parents have consented to reporting images and clinical information in the journal while understanding that anonymity cannot be guaranteed.

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