Dental management of a patient with down syndrome: A case report and review of literature

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ABSTRACT

Down syndrome (DS) is the most common chromosomal abnormality which affects numerous organs, including the orofacial region. Patients with DS may not be cooperative during dental treatment, and in cases of complex treatment, it is necessary to use oral or inhaled sedation and/or general anesthesia, which represents safe and efficient treatment resources. This article reports a management of DS in a 7-year-old male patient who came to the Hospital of New Delhi with the chief complaint of pain in lower right back tooth region. Due to the uncooperative nature of the patient, dental treatment was done under general anesthesia in which multiple dental restoration and extraction were done.

Key words: *Congenital heart diseases, Down syndrome, Oral health conditions*

Down syndrome (DS) is the most common chromosomal disorder and cause of mental retardation. It was first described by Esquirol in 1838 and later by, John Langdon Down in 1866 and was named mongolism [1]. DS is associated with intellectual impairment, and it is estimated that it affects 1 in 800 births or 5400 infants each year [1]. In addition to intellectual disability, motor disorders, and dysmorphology, individuals with DS present with medical conditions such as cardiovascular, immunological, hematological, respiratory, neurological, and musculoskeletal abnormalities [2]. Trisomy 21 (47, XY, +21 or 47, XX, +21) is the most common aneuploid condition compatible with survival at term [3].

The most common oral disorders include periodontal disease, malocclusion, mouth breathing, macroglossia, delayed teeth eruption, missing teeth, malformed teeth, microdontia, diastema, and bruxism [4]. Patients with DS have a high-arched V-shaped palate, which is caused by the deficient development of the midface, affecting the length, height, and depth of the palate [5]. This paper presents the case of a patient with DS, who was unable to cooperate in dental operatory; therefore, the dental treatment was planned under the general anesthesia.

CASE REPORT

A 7-year-old male child was brought to the Department of Pedodontics and Preventive Dentistry, of a tertiary care hospital of New Delhi, with a chief complaint of pain and swelling in the lower right and left back tooth region for the past 1½ months.

On general examination, the patient was short in stature, mentally challenged, and associated with the cardiac abnormality (Fig. 1). On extraoral examination, the patient had a saddle-nose deformity and midface hypoplasia that is retruded maxilla and protruded mandible. On intraoral examination, high-arch palate, dental caries with respect to 54, 55, 74, 84, and 85 and root stump with respect to 75 were present. Macroglossia with fissuring in the anterior two-third of the dorsum of the tongue was seen.

Treatment was planned to be done under general anesthesia due to the patient's medical condition and uncooperative nature. The restoration with glass ionomer cement of 54, 55, 74, 84, and 85 was done and 75 was extracted. The hemostasis was achieved (Fig. 2). The patient had a good recovery and discharged on the next day. The patient showed no complications. A follow-up was done after 1 week followed by 1 month, and the patient was asymptomatic.

DISCUSSION

DS is one of the most leading causes of intellectual disability, and millions of these patients face various health issues including learning and memory, congenital heart diseases, Alzheimer's diseases, leukemia, cancers, and Hirschsprung disease [6]. The most widely recognized features connected with DS are low muscle tone (babies seem "floppy"), upward inclination to the eyes, small skin folds on the inward corner of the eyes, small, anomalous molded ears, single profound wrinkle over the focal point of the palm, hypermobility (over the top capacity to expand joints), fifth finger that has stand out flexion wrinkle rather than two, extra space between the enormous toe and the second toe, enlarged tongue that tends to stand out, and flat facial elements with a little nose [7].

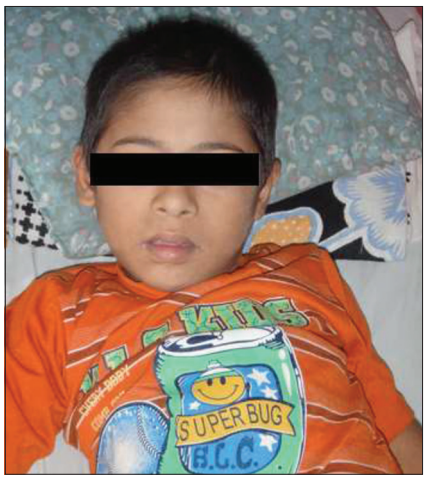

Figure 1: Child with Down syndrome

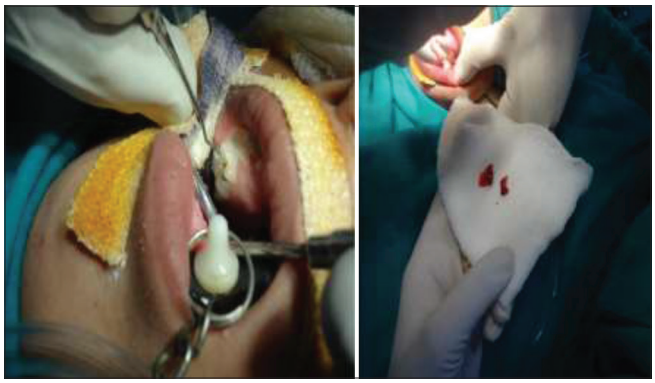

Figure 2: Treatment (restoration and extraction) under general anesthesia

The most common craniofacial features observed in children with DS are small nose, low nasal bridge, narrow, short, deep and high palate, bifid uvula, underdeveloped jaw, cleft lip, incomplete lip closure, hypotonic lips, fissured tongue, inaccurate, and slow tongue movement along with changes in temporary and permanent tooth eruption [8]. Dental anomalies are very common, both in the primary and permanent teeth, and occur with an incidence of 5 times greater in DS individuals than in the general population. An anterior open bite is normally found in the DS children; perioral muscles are affected by characteristic muscle hypotonia. This leads to a descending angle of the mouth, elevation of the upper lip, and an everted lower lip with tongue protrusion. Tongue thrust and posture might hamper enough eruption to cause anterior open bite and influence the shape of the dental arch and position of the teeth. The hypotonic tongue shows characteristic imprints of teeth along the lateral border. A scalloped (crenated) and plicated (scrotal) tongue is also common [5]. Normally, these children have a high palate, hypertrophy of the tonsils, hypotonia, and nasal obstruction, which lead to mouth breathing, and therefore, an anterior open bite is common [9].

Abnormalities in the number (fewer), size (smaller), and morphology and the timing of their development (late dentition) are constant features of this syndrome. In the primary dentition, the most commonly absent teeth are lateral incisors, while in the permanent dentition, third molars, second premolars, and lateral incisors, in this sequence, are the most frequently missing teeth [10]. Patients with DS have complete tooth mineralization, delayed tooth eruption, microdontia, enamel hypoplasia, hypodontia of deciduous teeth, and oligodontia which are the most common dental anomalies. Structural abnormalities include taurodontia, peg-shaped teeth, fusion, and gemination. Canines are the most affected teeth regarding shape and size.

The majority of the published studies have reported that patients with DS have lower rates of caries than those without DS. The low incidence of dental caries could be explained by the fact that diastema is frequent among individuals with DS due to microdontia and agenesis and small-spaced teeth, associated with delayed tooth eruption, reduce the chance of food stagnating between the teeth and diminish the smooth surface area for colonization by cariogenic bacteria [11]. Periodontal disease is the most significant oral health problem in people with DS. Manual dexterity difficulties which may lead to a poor oral hygiene. Plaque and debris accumulation, gingivitis, and periodontal disease are common. There is lack of understanding of the needs of oral hygiene and present of impaired dexterity, compromised immune system, low T cells count and leukocyte dysfunction in down syndrome patient. Consequently, patients with this syndrome have halitosis, discomfort during chewing, and early loss of permanent teeth. Gingivitis and periodontal disease start early in life and severity of these diseases increases with age [8].

Amniocentesis is the most conventional invasive prenatal diagnostic method accepted in the world. Amniocenteses are mostly performed to acquire amniotic fluid for karyotyping from 15 weeks onward. Amniocentesis performed before 15 weeks of pregnancy is referred to as early amniocentesis. Chorionic villus sampling (CVS) is usually performed between 11 and 13 (13+6) weeks of gestation and includes aspiration or biopsy of placental villi. Amniocentesis and CVS are quite reliable but increase the risk of miscarriage up to 0.5–1% compared with the background risk [12]. A few kids show just a couple of qualities; others display numerous. Since some of these elements are likewise found in individuals without DS, hereditary testing must be done to affirm the determination [7].

Life expectancy for people with DS has improved noticeably in recent decades. Nowadays, cardiac surgery, vaccinations, antibiotics, thyroid hormones, leukemia therapies, and anticonvulsive drugs (e.g. vigabatrin) have significantly improved the quality of life of individuals with DS. Actually, the life expectancy that was hardly 30 years in the 1960s is now increasing >60 years of age [12].

CONCLUSION

Since there is no medical cure for DS, the children suffering from DS should be treated with early medical support and developmental interventions initiation during childhood. Children with DS should be provided with speech therapy, physical therapy, and work-related therapy and receive special education and assistance in school.

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