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Unilateral Impaction of Mandibular Canine in a Down Syndrome Patient: A Case Report

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ABSTRACT

A 12-year-old female patient, with large nasal bridge, mongoloid slants, clinodactyly, saddle gap of toes, slanting palpebral fissures, and a flat facies with ocular hypertelorism was reported. The patient's medical history showed intellectual impairment, hypothyroidism, and allergy to penicillin and cow milk. Intraoral examination revealed that there was severe crowding, with Angles class I Dewey's modification type I. A radiographic examination showed that the root of tooth 44 has sharp dilaceration toward the mesial in the apical third. Impacted canines were measured approximately 17.5 mm from the cusp till root apex. Treatment plan included prescription for pain relief. Oral prophylaxis was followed by root canal treatment and full coverage restoration. Induced eruption was planned. This case report provides insight into various oral conditions associated with Down syndrome (DS). The treatment was challenging and it needed a comprehensive approach with a preventive dentistry practice and regular screening. Dental practitioners should be aware of DS and its effect on oral health with the main focus on an effective treatment plan.

KEYWORDS

Down syndrome, impacted canine, intellectual impairment, oral health, disability

INTRODUCTION

The severity of Down syndrome (DS), a common genetic disease, is frequently accompanied by cardiovascular issues, viral infections, hypotonia, hearing loss, and physical disability in people with this developmental condition. The DS related orofacial and skeletal development contributes to dental problems (Holmes, 2014). The cranial base, the middle third of the face, and the proportion of maxilla and mandible alter as a result of anatomical development. Because of this skeletal change, individuals with DS have a distinct facial appearance. The tongue, which is fissured and protrusive, is the soft tissue characteristic most impacted. Evidence has demonstrated that the prevalence of impacted canines and other teeth among DS patients has been reported over 15% (Shapira et al., 2000). The tonsils and adenoids also grown in size. Dental anomalies among DS individuals are frequently associated with tooth morphology, such as a decreased root to crown ratio, decreased tooth size, hypodontia or partial anodontia, and delayed eruption (Mathew et al., 2017; Rai et al., 2022).

Institutional review board statement

The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of the Deanship of Innovation and Scientific Research at Al-Baha University, Saudi Arabia (approval number:45103810/2/13/2/1445).

Case report

A 12-year-old female patient, with large nasal bridge, mongoloid slants, clinodactyly, saddle gap of toes, slanting palpebral fissures, and a flat facies with ocular hypertelorism was reported. The patient complained chiefly of pain and swelling in the right mandibular posterior teeth region.

In the patient's medical history, it was shown that she has a history of intellectual impairment, hypothyroidism, and allergy to penicillin and cow milk. Moreover, neither other medical abnormalities nor other noteworthy medical

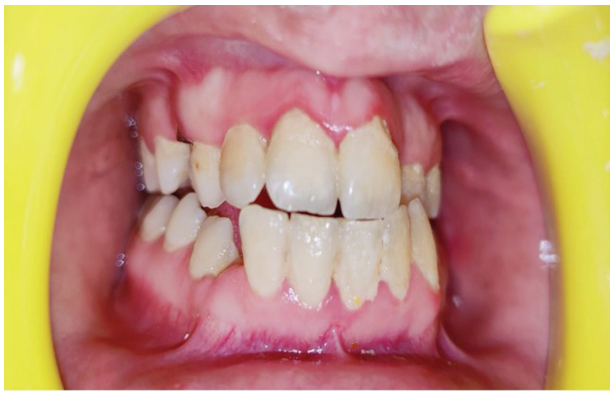

Figure 1: Intraoral view of the patient.

or family history was discovered. During intraoral examination, it was found that there was severe crowding, with Angles class I Dewey's modification type I (Singh, 2015). Meticulous clinical examination revealed that the patient had one missing tooth, number 43, and a deep occlusal caries tooth, number 26. The patient had generalized mild gingival inflammation, with no space between teeth 42 and 44 with tender percussion positive on tooth number 44 only. Figure 1 shows the intraoral view of the patient.

A radiographic examination using orthopantomography (OPG) was then conducted. It was revealed that the root of tooth 44 not only has sharp dilaceration toward the mesial in the apical third but also is tipped lingually and distally due to the pressure effect of tooth number 43. Furthermore, tooth number 43 was shown to be impacted and measures approximately 17.5 mm from the cusp till the root apex. The level of crown margin of this tooth is at the level of middle third of the crown of 44. In other words, tooth 43 lies obliquely with crown more distal toward the root apex of 44. Periodontal space widening was detected and measured approximately 4.7 mm, and interdental bone loss was also observed around tooth number 43.

The OPG and cone beam computed tomography were carried out for further investigations as shown in Figures 2 and 3. Patient's parents were duly informed about the consequences of the impacted teeth. A detailed treatment plan was discussed with them. Treatment plan included several phases, it was started with prescribing an analgesic for pain relief. Next, oral prophylaxis was performed followed by root canal treatment on teeth number 44 and 26, which was followed by full coverage restoration. Forced eruption was planned for tooth 43 within the next 3 months.

DISCUSSION

DS is one of the biggest causes of intellectual disability, and millions of patients suffer from various health issues, including cognitive impairment, memory problems, and congenital heart disease. Children with DS frequently have experienced delayed development and behavioral issues (Asim et al., 2015). It is evident that DS individuals are now living longer lives and participating in more social activities than ever before due to enhanced medical health-care facilities and increased awareness of this syndrome.

Exploring the literature has shown that DS individuals are more exposed to dental problems than normal individuals. In this respect, dental aberrations such as hypodontia, microdontia, unusual dental crowns, and taurodontism are quite frequent in both primary and permanent teeth. Their prevalence is five times higher in individuals with DS than in general population. Cleft lip and palate occur three times more frequently in DS individuals than in general population. DS children typically have an anterior open bite; perioral muscles are commonly impacted by distinctive muscular hypotonia. Patients with DS may also have periodontal disease, premature tooth loss, decreased salivary flow, dental crowding in both arches, and decreased occlusal vertical dimension. Dribbling of saliva from the corner of the mouth

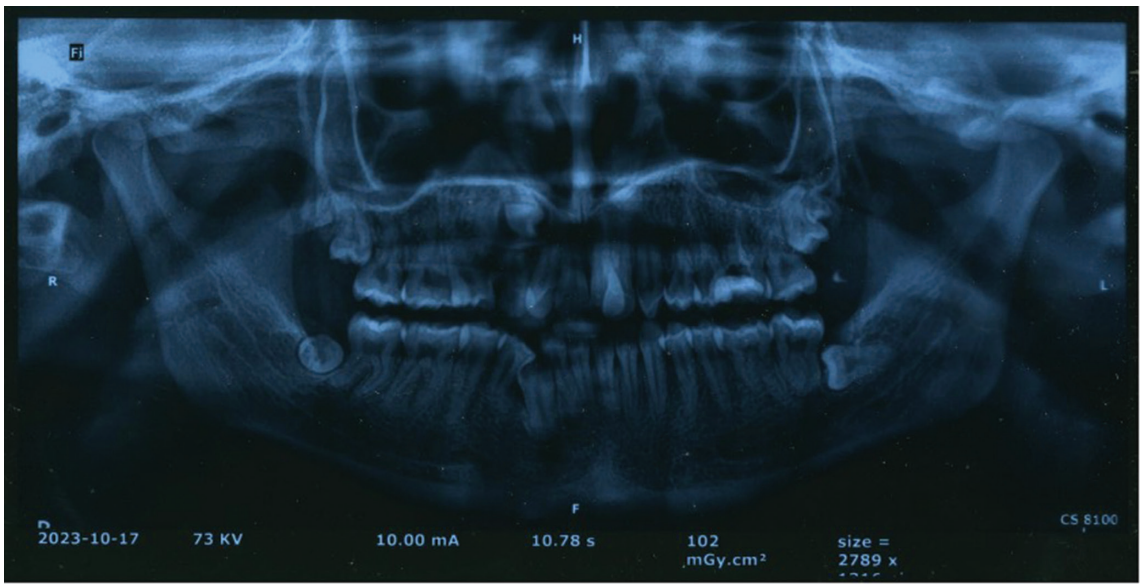

Figure 2: Patient's OPG radiograph. Abbreviation: OPG, orthopantomography.

Figure 3: Patient's CBCT radiograph. Abbreviation: CBCT, cone beam computed tomography.

has been commonly reported among DS individuals (Sasaki et al., 2004; Thanvi et al., 2018).

This case study presents a case of unilateral impaction of mandibular canine in DS patients. Systemic and local factors influence tooth eruption. Disruptions to the eruptive process can result in ectopic eruption, impaction, primary retention, and secondary retention. The stop of tooth eruption induced by a clinically or radiographically evident physical barrier in the eruption path is known as impaction. This could be owing to physical obstructions such as dental crowding, supernumerary teeth, odontomes, and odontogenic tumors, or it could be due to an ectopic eruption pathway (Puryer et al., 2016). The treatment of the presented case was challenging as intraligamentary and local infiltration of local anesthesia were used. These additional injections only produced a minor form of anesthesia. The most beneficial treatment is an intrapulpal injection provided following access to the canal orifice. To achieve total pulpal anesthesia, however, multiple intrapulpal injections were required.

Evidence has demonstrated that patients with DS are usually managed in a multidisciplinary manner. A newborn DS patient should have karyotyping performed to confirm the diagnosis. The family should be directed to a clinical geneticist for genetic testing and parent counseling. Parental education is one of the most important components of their care for them to be properly diagnosed and treated (Alzahrani, 2019). Treatment is primarily symptomatic, and full recovery is not achievable (Kayacı and Gezgin, 2022; Akhtar and Bokhari, 2023). While life expectancy has grown during the last three decades, these people still have a shorter life expectancy than healthy people (O'Leary et al., 2018).

Making a difference in oral health of an individual with DS may take time at first, but perseverance can yield great results and significant rewards. Adopting these measures will have a tremendous impact not only on your patients' dental health, but also on their quality of life (AlJameel and AlKawari, 2021; Elrefadi et al., 2022). In this respect, some recommendations may be highlighted regarding the management of oral health of individuals with DS. Because speaking may be challenging for people with DS, one should listen actively. Oral examinations should begin on his or her first birthday and continue on a regular basis to assist in identifying aberrant teeth production and eruption trends. A panoramic radiograph can be taken to find out whether any teeth are missing from birth. Primary teeth should be kept as long as possible since they operate as natural space

maintainers. Extra time should be provided to discuss oral health issues or directions, as well as to display the tools. To compensate for any short-term memory issues, the use of basic and concrete instructions that are repeated frequently is recommended.

Early appointments can help guarantee that everyone is aware and attentive, as well as save waiting time. Perhaps a new toothbrush at the conclusion of each appointment is all that is required to assure compliance. If feasible, patients with DS can be scheduled early in the day. Oral care should be provided in a distraction-free environment. Any unnecessary images, sounds, or other stimulation that may make your patient reluctant to cooperate needs to be reduced. Moreover, try to be consistent in all elements of oral healthcare delivery. The use of the same staff, dental operatory, appointment timings, and other aspects help to maintain familiarity. The more consistency you offer your patients, the more likely they are to cooperate. Preventive interventions such as topical fluoride and sealants may be highly recommended. For snacks, emphasize noncariogenic foods and beverages. Encourage carers to refrain from using sweets as incentives or rewards (Chin et al., 2009; Mubayrik, 2016; Schmidt et al., 2022).

Clinical implication and significance

DS associated with the oral conditions is a challenge for dental health care and treatment. Intrinsic barriers of eruption associated with perioral muscular hypotonia and its impact on dentition are the causative factors for various oral diseases. Dental practitioners should be aware of DS and its effect on oral health, with the main focus on an effective treatment plan.

CONCLUSION

This case report provides insight into various oral conditions associated with DS. Delays and disruptions in the eruptive process can result in ectopic eruption, impaction, and primary and secondary retention. The treatment of the presented case was challenging and it needed a comprehensive approach with a need of a special dental-care specialist. It is essential to practice preventive dentistry with regular screening in these patients.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest in association with the present study.

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