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CASE REPORT

Prosthodontic Management of Downs Syndrome Patient Using Neutral Zone Technique –A Case Report

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A B S T R A C T

Down's syndrome or Trisomy 21 is characterized by the presence of macroglossia and the inability to adapt to dental prostheses due to motor and mental deficiencies. The present case report discusses the management of the challenges faced in the rehabilitation of a 22 year old Down's syndrome patient with a complete denture using a neutral zone technique.

Key words: Down's syndrome, Neutral zone, Complete denture.

Introduction

Dentist's quite often encounter oral problems of people with different abilities in their practice. These patients present not only with oral disease but behavioral problem as well. Down syndrome is one such entity presenting challenge for the dental practitioners. Down syndrome, also known as trisomy 21 and mongolism, was first described by John Langdon Down in 1866.[1] It is a genetic condition caused by an extra chromosome 21 which results in various systemic and oral

anomalies as well as learning disabilities and characteristic appearance.[1] Down syndrome (Ds) is the most frequent chromosomal aberration in humans, with an incidence of 1.3 per 1000 live births, resulting from complete or partial trisomy of chromosome 21.[2]

Dental features associated with Down Syndrome include open mouth posture due to underdevelopment of the middle third of the face and. poor muscle tone, macroglossia, ,delayed development and eruption of the teeth ,hypodontia., microdontia, .hypocalcification and hypoplastic defects, reduced caries risk and high incidence of severe periodontal disease.[3] Therefore, the most common dental problem faced by these patients in their mid-30s is extreme tooth mobility leaving no choice but extraction.The management of missing teeth in Down·Syndrome patients poses a challenge .[3]

Here is a case report of oral rehabilitation of Down's syndrome patient with edentulous arch.

Case report

A 22 year old female patient accompanied by her father reported to the department of Prosthodontics at JSS dental college Mysore. Her father informed us about patient's complaint of completely missing teeth in upper and lower arches and thus wanted its replacement. History revealed mental retardation since birth with frequent upper respiratory tract infection. No history of drug allergy, seizures or any systemic disease was found. Patient was not found under any medication. Loss of teeth was due to exfoliation of permanent teeth at an early age.

The patient presented with typical phenotypic features all directing towards Down's syndrome .The facial characteristic of the patient included frontal bossing, flattened nasal bridge and almond shaped eyes .Other features included trunkal obesity, transverse palmer crease and spacing between the toes. (Fig 1) .Intra oral features included high arched palate, macroglossia , resorbed mandibular ridge, angular chelitis, dry and open mouth with protruding tongue. (Fig 2). All clinical procedures were fully explained to the father, who signed an informed consent form, authorizing treatment and publication of the case. The treatment included conventional

complete denture using a neutral zone technique for atrophic ridges and macroglossia due to the syndrome.

Fig 1. Extra-oral features

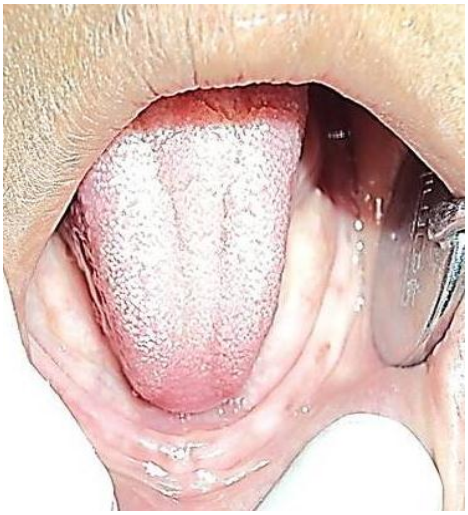

Fig 2 Intra-oral features

Procedure:

Primary impression was made in alginate impression material (Jeltrate chromatic alginate, Dentsply India). Diagnostic casts were poured using plaster of paris (Dentico neelkanth, India). Special tray was made using self-cure acrylic (DPI cold cure acrylic material, India). Border molding was done and secondary impressions were made using admixed technique (3 parts of impression compound(DPI Pinnacle, The Bombay Burmah trading corporaton Mumbai)and seven parts of green stick).[4] (Fig 3) Master cast was poured in type iii dental stone(Kalstone India). Jaw relation was recorded and mounting was done. Lower occlusal rim was removed and reinforcing wire was adapted with acrylic stops in order to restore vertical dimension (Fig 4) Neutral zone was recorded by adapting green stick compound in the area and

Fig 3. Secondary impression

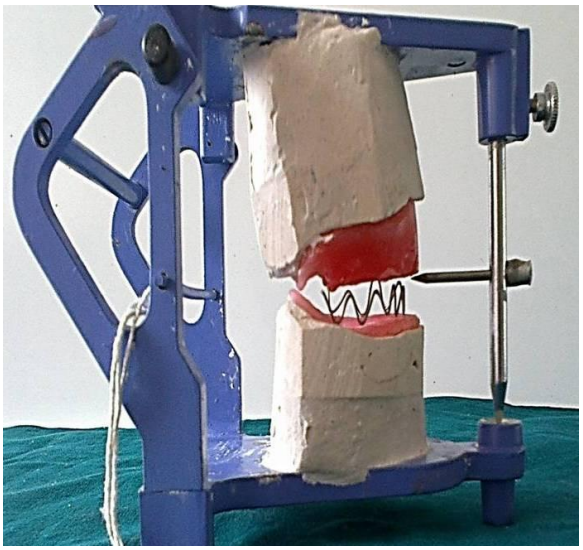

Fig 4. Recording vertical height for neutral zone technique using reinforced wire

asking patient to perform functional movements like whistling blowing, pursing etc. Putty index (Reprosil , Dentsply India) was adapted over the recorded green stick and the green stick was removed. Wax was poured in the area and new occlusal rim was fabricated. Teeth were arranged in neutral zone.[5] (Fig 5). Trial was done followed by insertion. (Fig 6) After care instructions were given to the caretaker.

Discussion

Restoration of aesthetics, function, and preservation of ridges is of prime importance to any individual.[6] Patient with special ability shouldn't be deprived of the same.

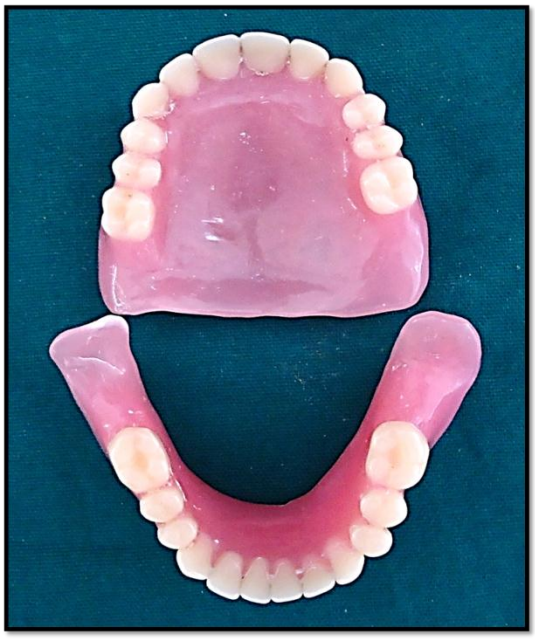

Fig 5. Denture fabricated

Fig 6. Denture inserted

The current case report talks about oral rehabilitation of edentulous Down's syndrome patient in the form of complete denture. The severity of oral diseases in patients with Down's Syndrome together with their psychomotor and cognitive disabilities requires a comprehensive treatment plan including the overall management of each individual's oral status. [3]Dental management of a Down's syndrome patient starts with the behavior management. As per National Institute of Dental and Craniofacial Research, the practical oral care for people with Down's syndrome one should 1.Listen actively. 2.Talk with the parent or caregiver to determine your patient's intellectual and functional abilities, and then explain each procedure at a level the patient can understand. 3.Use simple, concrete instructions; Scheduling appointments-early in the day and directing first appointment towards orientation and history must be the part of the protocol.[7]

Treating the highly resorbed mandibular ridge accompanied with an enlarged tongue, along with the average response of the patient to all the clinical procedures, is a challenge. The caretaker was explained all the treatment options available. In the present case, the patient was not financially sound and not willing to undergo any surgery and thus implant supported prosthesis was not considered. And one of the most important factors responsible for excluding implants was its risk of failure due to poor bone quality. Patients with Down's Syndrome are prone to develop osteoporotic bone. Impaired host response is also seen in these patients..[8,9] Current research suggest that reduced neutrophil and monocyte chemotaxis, reduced phagocytosis, and a defect in T-cell proliferation and maturity might be reasons for the increase in periodontal disease seen in these patients .[7]

Thus considering the ifs and buts, choice of conventional denture was made. Admixed technique was used in this case report which is a simple impression procedure for resorbed ridge.[4] A neutral zone technique was used here to counteract the effect of macroglossia and to increase the stability of the denture. Neutral zone is defined as that area or position where the forces between the tongues or lips are equal. As per this technique teeth are arranged as dictated by the musculature.Patient is asked to perform

various movements as stated above in order to record the neutral zone.In the conventional technique teeth is arranged on the ridge.[10] Considerable amount of literature has proven neutral zone technique to yield a better patient satisfaction than the conventional denture fabrication. [5]

Last but not the least, the role of care taker is crucial owing to the mental disability. As the patient suffers from mental disability and upper respiratory tract infection, removal of denture at night is important as it might cause obstruction in breathing. Thus to conclude, syndromic patients should be treated with all resources provided by modern dentistry, ranging from a simple tooth extraction to the most audacious rehabilitating procedures, re-establishing the oral function and aesthetics of individuals, regardless of their physical or neurological condition. Although more experience is needed before dental implants can be considered a suitable option during oral rehabilitation in people with Down syndrome.[1]

The dentist must have an interdisciplinary approach to be scientifically based, technically competent and be socially integrated in order to provide the best care possible, and promote the inclusion of individuals with special needs to health services.[1]

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