

Patient with Down Syndrome and Implant Therapy: A Case Report

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Patients with Down syndrome 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 represent safe and efficient treatment resources. There are few reports about oral rehabilitation with dental implants in patients with Down syndrome in the literature. This paper presents the case of a patient with Down syndrome and moderate mental retardation who suffered avulsion of the maxillary left central incisor after a fall, and was treated by means of a single dental implant with immediate load carried out under general anesthesia. After 4 years of follow up, there has been improvement in the sleep obstructive apnea syndrome due to the use of a tongue crib adapted for providing esthetics and preserving the implant placed.

Key Words: Down syndrome, dental implants, immediate loading, drug sedation, general anesthesia.

INTRODUCTION

Trisomy 21 (47,XY, +21 or 47,XX, +21) is the most common aneuploid condition compatible with survival at term. This trisomy causes Down syndrome (DS), a phenotype that was originally described by John Langdon Down in 1866 (1,2).

Several clinical and physiological features of DS have direct consequences on the oral health of patients (3). Dental abnormalities are usually observed, including abnormal structure, number, eruption and position of teeth, as well as a high incidence of dental caries (4) and periodontal disease (5). Adults with DS might be more prone to suffering falls due to impaired motor development (6). Fracture or luxations of anterior teeth are frequent and usually compromising pulp vitality (7).

The management of patients with DS may be on an outpatient basis, but treatment depends on complexity of the procedures and the level of patient cooperation. When patient cooperation is not achieved, intervention under sedation or general anesthesia becomes the best alternative for carrying out the dental treatment.

This paper presents the case of a patient with DS and moderate mental retardation who suffered avulsion of the maxillary left central incisor after falling from his own height, and was treated by means of a single dental implant with immediate load carried out under general anesthesia.

CASE REPORT

This case was conducted at the in the Clinic for Special Needs Patients of the Dental School of the Federal University of Juiz de Fora, Brazil. All clinical procedures were fully explained to the family, who signed an informed consent form, authorizing treatment and publication of the case.

A 22-year-old Caucasian male patient with DS and moderate mental retardation was referred to our Special Needs Patients clinic with history of falling from his own height after a seizure attack with consequent avulsion of the maxillary left central incisor (Fig. 1A).

Review of medical history revealed that the patient had a preterm birth, did not present cardiac,

renal or hepatic disorders, and did not use anticonvulsant drugs. His mother reported the existence of 6 individuals with neurological involvement in the third generation of the family. Of those, three had DS. Intraoral clinical examination showed missing maxillary left central incisor, marked parafunctional habit with accentuated wear facets on posterior teeth, pseudomacroglossia exacerbating the hypotonic tongue, posterior primary teeth and permanent first molars. The patient suffered from sleep obstructive apnea syndrome. Radiographic examination showed retention of several permanent teeth and confirmed the absence of the maxillary left central incisor (Fig. 1B).

As the patient was extremely unhappy with his appearance because of the missing tooth, a tongue crib was prepared. The aim of the device was to enhance the patient self-esteem by the placement of a temporary artificial tooth, as well as to improve sleep apnea and snoring (Figs. 1C and 1D). Orthodontic evaluation showed that the permanent maxillary right and left

molars would serve as anchorage for the tongue crib with the palatal ring.

Double impression of the maxillary and mandibular dental arches for production of the tongue crib was performed under drug sedation with 15 mg of midazolam maleate (Dormonid[®]; Roche, Rio de Janeiro, RJ, Brazil) at the outpatient clinic.

Two months later, the patient underwent surgery to place an immediate loading osseointegrated implant under general anesthesia, in special clinic patients in the operating room with anesthesiologist. Surgical access was obtained on a conservative manner aiming at the preservation of the anatomy and gingival esthetics. A crestal incision was performed to elevate a full-thickness mucoperiosteal flap. An implant (Sin; Innovation Implants, São Paulo, SP, Brazil) replaced the avulsed tooth (SA 415; 15 mm long x 4.0 mm diameter). To achieve maximal bone-to-implant contact and maximal initial stability, the insertion torque value was set at 40 N/cm. Then, a provisional acrylic resin tooth was

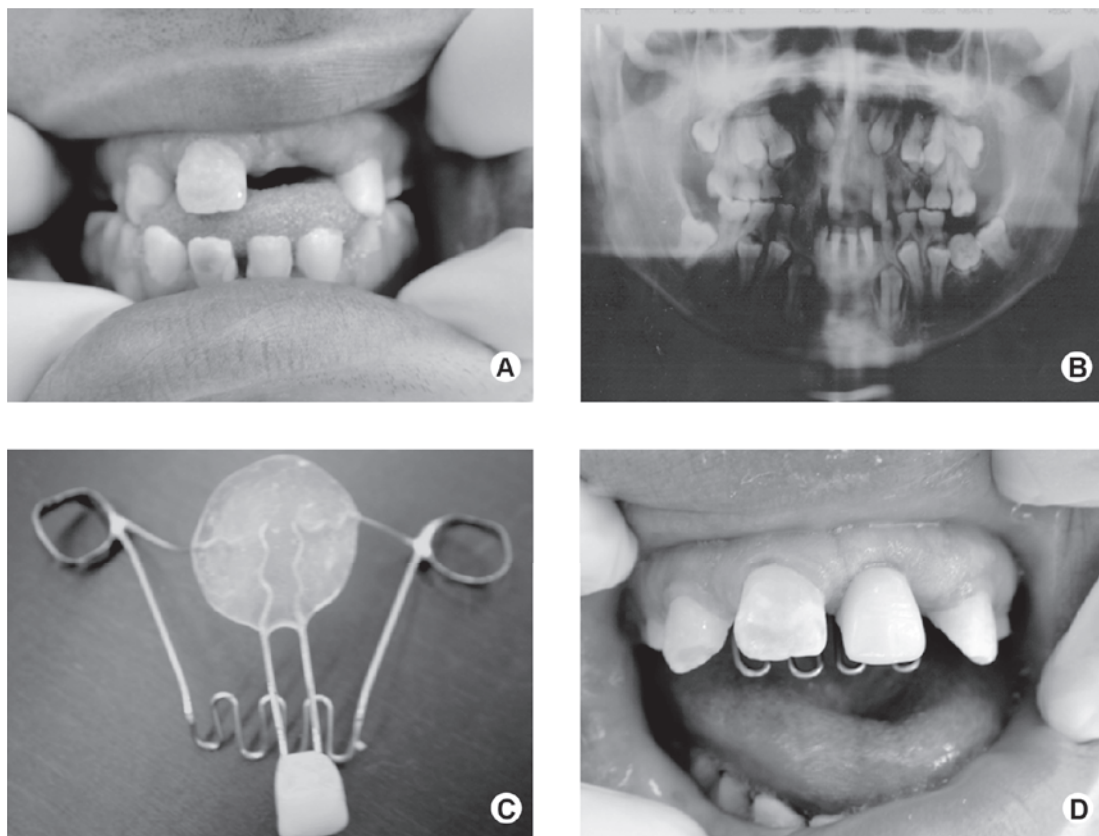


Figure 1. Panel of clinical and radiographic images showing the provisional rehabilitation of the missing anterior tooth. A = Photograph showing the absence of maxillary left central incisor; B = Preoperative panoramic radiograph; C = Tongue crib and palatal ring with provisional tooth; D = Frontal view of the adapted tongue crib.

installed (Fig. 2B-C).

After the surgical procedure, antibiotic therapy (amoxicillin 500 mg, 3 times/day; Eurofarma, São Paulo, SP, Brazil) was started and maintained for 7 days. Analgesic (Ibuprofen 400 mg; Neo Química, Anápolis, GO, Brazil) was prescribed for 3 days and the use of 0.12 percent chlorhexidine oral rinses twice a day was indicated during 7 days (Periogard; Colgate-Palmolive Ltda, São Paulo, SP, Brazil). An ice pack was supplied to reduce post-surgical swelling. The patient was reevaluated after 1 week and the sutures were removed. His mother was instructed as to hygiene procedures and follow up visits.

After 12 months of implant placement, the temporary crown was replaced by an all-ceramic crown (Vita In Ceram; Vident, Brea, CA). The patient has been followed up clinically and radiographically for 4 years at visits scheduled at an annual basis, showing maintenance of esthetics and function. Figures 3A-B show the 4-year radiographic follow up of the case.

The successful therapy with the tongue crib led to the decision for its maintenance and only the provisional tooth of the tongue crib was removed.

DISCUSSION

Dental treatment in Down syndrome patients is a reality in dental offices due to the increased life expectancy of these patients, which is approximately 60 years (8,2).

Horbelt (2) reported that 73% of patients with DS present occlusal problems due to the abnormal development of the maxilla and tongue hypotony (2). Underdeveloped maxilla combined with increased tongue volume leads to congested upper airways and mouth breathing, cross-bite and sleep apnea (1).

The evolution of implant design and surface configuration, modification of surgical techniques, new restorative modalities and improvements in diagnostics and surgical guiding tools have simplified functional rehabilitation with dental implants (9). In the present case, it was necessary to use alternative treatments like conscious sedation and general anesthesia to perform the functional rehabilitation with a provisional crown and then with a single.

Indications for conscious sedation include

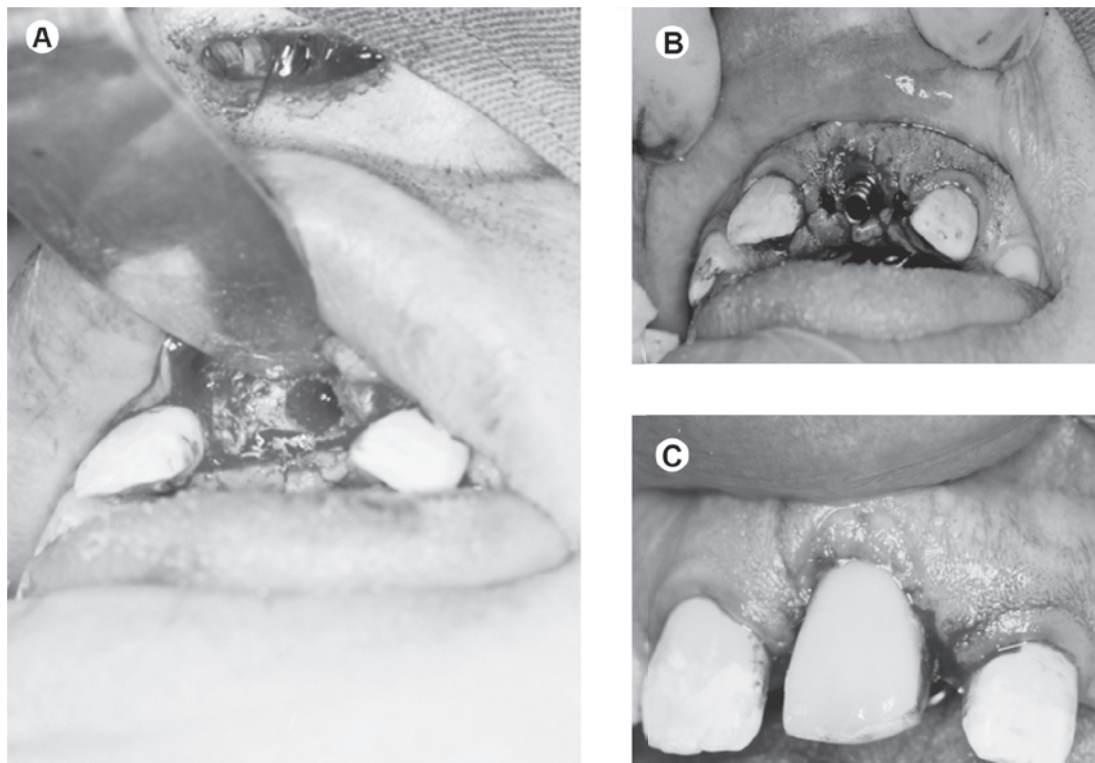


Figure 2. Panel of clinical images of the surgical procedures for rehabilitation with the dental implant. A = Site of the implant bone with walls 5; B = Installation of the implant; C = Adaptation of a provisional acrylic resin tooth immediately after surgery.

moderate mental and psychological disorders, including DS (10,11). The sedative drug reduces motor activity, moderates excitement and soothes the individual. The hypnotic agent produces somnolence and facilitates the onset and maintenance of a state of natural sleep in its electroencephalographic parameters from which the individual can be easily awakened (10) and appropriately respond to physical stimulation and verbal command (12-14).

Before indicating general anesthesia, it is necessary to know the risks for its correct use in dental treatment of such patients (10). A relevant finding of DS for anesthesiologists is the instability of the upper cervical spine-atlanto-occipital joint, which occurs in approximately 15% of cases. This instability is produced by joint laxity, skeletal anomalies, or both and can result in neurologic impairment, including quadriplegia. However, there are no evidence-based practical guidelines to aid anesthesiologists in caring for these patients. The risk of spinal cord injury during anesthesia is unknown, as are the preoperative factors that might aid in accurately defining the risk in specific patients (15). It results in severe sequelae to patients, when improperly handled.

It is also necessary to know the implications and possible risks for osseointegration process and implant survival. A previous study (16) showed that implants may be successful and have long survival if these patients continue receiving professional follow-up (16,17). Implant treatments are indicated to people with reduced motor and/or neurological skills, who need more comprehensive treatments (18). There is no comparative study indicating that any specific systemic

disease or congenital condition can affect implant osseointegration (16).

The analysis of the preoperative periodontal condition of the adjacent teeth and bone defect morphology is extremely important because these factors determine the choice between immediate implant or guided bone regeneration treatment followed by implant installation in a subsequent intervention (19). In this case, the alveolar bone was carefully examined and absence of chronic infection in implant sites was observed (Fig. 2A). The 5-wall defect was treated with immediate implant placement.

Van de Velde et al. (9), in a prospective study, obtained a success rate of 96.7% for implants placed in the mandible with immediate loading. The possible reason for the two failures in their patient with Down syndrome could be the overloading. As it was difficult to communicate with the patient, it was not possible to verify whether the postoperative instructions were followed up appropriately, although the patient's caretaker was informed properly. According to Ferrario et al. (20), the implant-bone masticatory function has a different neuromuscular coordination than a natural occlusion. Also, it cannot be excluded that clenching habits, tongue pressure and changes in proprioception can affect implant integration in the patients with DS. In the present case, the adaptation of the tongue crib was favorable to the resolution of the sleep obstructive apnea syndrome and the follow up of the implant placed.

The choice for the oral rehabilitation technique is fundamental to treatment success. The technique of oral implants is well documented in the literature. The dentist must have an interdisciplinary approach

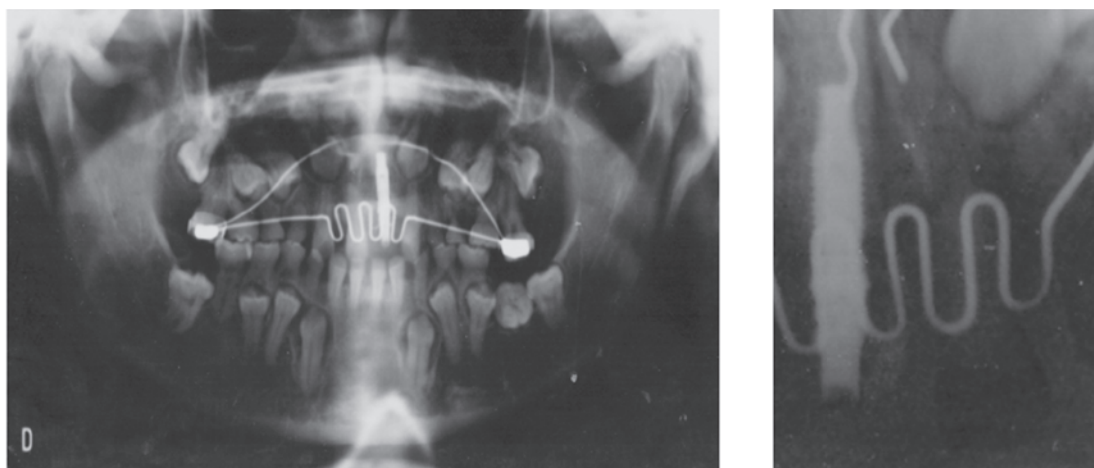


Figure 3. Four-year follow-up of the case with orthopantomogram (A) and periapical radiograph (B).

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.

Syndromic patients should be treated with all resources provided by modern Dentistry, ranging from a simple tooth extraction to the most audacious rehabilitating procedures, reestablishing 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, this case report shows a promising outcome.

RESUMO

Pacientes portadores da Síndrome de Down podem não se mostrar cooperativos durante o tratamento odontológico, e nos casos de tratamento complexo, existe a necessidade da sedação medicamentosa e ou da anestesia geral, que representam recursos seguros e eficazes ao tratamento. Poucos relatos sobre reabilitação oral por meio de implantes em pacientes com Síndrome de Down são encontrados na literatura. Neste contexto, apresentamos um relato de caso de reabilitação oral em paciente portador da Síndrome de Down e deficiência mental moderada, através de implante unitário com carga imediata, sob anestesia geral. Após 4 anos de acompanhamento, observou-se melhora da síndrome da apnéia obstrutiva do sono, devido ao uso de grade lingual adaptada com finalidade estética e de preservação do implante colocado.

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