ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2022; 8(1): 322-327

www.oraljournal.com
Received: 21-11-2021
Accepted: 25-12-2021

Dr. Mariajosé González villarreal
MSc in Periodontology Student. Universidad Autónoma de Coahuila, Faculty of Dentistry, Torreón, Coahuila, México

Dr. Edson Josué Pacheco Herrera
MSc in Periodontology Student at Universidad Autónoma de Coahuila, Faculty of Dentistry, Torreón, Coahuila, México

Dr. Martha Margarita Aguado Arzola
MSc in Periodontology and Professor at the Universidad Autónoma de Coahuila, Faculty of dentistry, Torreón, Coahuila

Dr. Jesús Alfredo Aguado Arzola
MSc in Rehabilitation and Professor at the Universidad Autónoma de Coahuila, Faculty of dentistry, Torreón, Coahuila, México

Dr. Gilberto Zatarain Hernández
MSc in Periodontology and professor at the Universidad Autónoma de Coahuila, Faculty of Dentistru, Torreón, Coahuila, México

Dr. María de los Ángeles Pietschmann Santa María
MSc in Periodontology and coordinator at the Universidad Autónoma de Coahuila, Faculty of Dentistry, Torreón, Coahuila, México

Corresponding Author:
Dr. Mariajosé González Villarreal
MSc in Periodontology Student. Universidad Autónoma de Coahuila, Faculty of dentistry, Torreón, Coahuila, México

Implantological and mucogingival treatment approach in a patient with cerebral palsy

Dr. Mariajosé González Villarreal, Dr. Edson Josué Pacheco Herrera, Dr. Martha Margarita Aguado Arzola, Dr. Jesús Alfredo Aguado Arzola, Dr. Gilberto Zatarain Hernández and Dr. María de los Ángeles Pietschmann Santa María

DOI: https://doi.org/10.22271/oral.2022.v8.i1e.1447

Abstract
This article includes the report of a clinical case of a 41-year-old female patient with cerebral palsy and hypothyroidism. The treatment comprised the three stages of periodontal therapy comprising hygienic phase I accompanied by phase II that compromises guided implant placement and horizontal guided bone regeneration with soft tissue conditioning through the placement of a connective tissue graft through the VISTA technique and finally phase III of maintenance.

Keywords: Dental Implant, cerebral palsy, guide bone regeneration, connective tissue graft

Introduction
Cerebral Palsy (CP) is a persistent movement and postural tone disorder secondary to nonprogressive aggression in an immature brain. There are different comorbidities associated with CP in which the patient is systematically affected, including malnutrition, constipation, respiration, digestion, the musculoskeletal, urinary, and sensorineural system (Strabismus, visual and / or auditory alteration) and causing epilepsies, intellectual deficits and a language delay [2]. This can be divided according to the physiological classification of cerebral palsy into; spastic, ataxic, atonic, and extrapyramidal or athetosic and mixed.
Dental consultation for patients with cerebral palsy becomes complex, but there are different methods to conduct it effectively. Among these procedures, conscious sedation may be used. Said technique consists of the administration of a sedative drug that reversibly reduces the activity of the central nervous system, and whose main function is to induce sleep [11]. This helps reduce anxiety, agitation, pain, and improves gas exchange, thus reducing complications in high-risk patients.
Due to the nutritional deficiency and limited motor skills of these patients, their stomatognathic apparatus presents complications such as the loss of dental organs, which occurs due to different etiologies; dental fracture, pulp necrosis, as well as cavities and periodontal disease.
If the rehabilitation of these missing dental organs is taken into consideration with the placement of dental implants, the residual ridge and bone quality must be taken into account.
Sufficient bone volume will prevent later problems such as: Exposure of the implant chords, future pictures of mucositis, peri-implantitis, and the risk of failure.

Classification of alveolar ridge defects
The Seibert classification establishes three types of alveolar ridge injuries:
1) The loss of tissue in the buccal-lingual direction, with normal height of the ridge in an apical coronal direction, leading to loss of width.
2) Tissue loss in apico-coronal direction in normal width of the alveolar ridge in the lingual vestibule direction, leading to loss in height.
3) Combined height and width loss [7-8].

Apart from this, we consider Allen's classification to correctly define the type of defect in terms of its depth:
1) Slight: Less than 3 mm,
2) Moderate: Between 3 and 6 mm,
3) Severe: Greater 6 mm. [9]

Guided Bone Regeneration.
Guided Bone Regeneration (GBR) is based on the principle of natural healing of the body, in which by means of a physical barrier (Membrane) it is possible to separate and be selective with the cell population that will repopulate the defect, excluding cells soft tissue, allowing internal bone maturation and external epithelial healing.
This procedure is used as alveolar preservation after the tooth extraction on defects such as dehiscences or fenestrations in implants, including healed area with the need for volume increase prior to implant placement [1].

Bone Grafts
Bone grafts with or without the use of biomaterials are an important alternative for rehabilitation treatment with dental implants in areas with marked bone deficit, such as atrophic edentulous areas.
These are composed of autograft, (from the same patient), allografts, xenografts or alloplastic materials, each with different qualities and times of reabsorption.

Autologous bone
The Autologous Bone presents the ideal properties of a graft: It has osteogenic, osteoconductive and osteoinductive capacity, achieving a regenerative capacity like no other material, thus being the first choice for treatment.

Allografts
There are different complications in obtaining autologous grafts, such as the limited number in some patients, for which various bone substitutes are sought to minimize complications.
Allografts are derived from bone tissue from individuals of the same species, and have osteoconductive properties, which stimulate bone formation.

Xenografts
Xenografts are bone substitutes from a species other than the recipient. These may be animals, such as cattle, as well as some derived from corals or algae. They have biocompatibility and osteoconductive properties, allowing vascular growth, migration and cell differentiation, which as a consequence leads to the formation of bone tissue. These are highly biocompatible, and thanks to the way they're obtained and sterilization processes they're submitted to, they have a low incidence of disease transmission.

Alloplastics
Alloplastic bone substitutes are materials of a non-organic nature, their origin is synthetic and they have osteoconductive qualities. There is a wide variety of these, such as bioceramics and bioactive crystals.

Guided surgery vs conventional surgery
In implantology, implant placement is generally performed with the elevation of a flap for better visualization of the surgical field, which makes placement easier, correctly observing the anatomical landmarks and thus reducing the risk of damaging anatomical structures or causing fenestration in cases of narrow alveolar ridges. This technique also preserves the amount of keratinized gingiva.
Recently, the concept of flapless implant surgery has been introduced, which reduces operative times and becomes an excellent alternative in patients with the ideal conditions to perform it, which are a sufficient amount of keratinized gingiva and bone volume. It is an excellent option which facilitates the management of soft tissues during surgery.
For successful implant treatment without flap elevation, correct information transfer about implant position and angulation is of utmost importance, from the study casts to the surgical bed.
The placement of anterior maxillary esthetic zone implants with a high smile line is one of the greatest challenges due to aesthetic considerations. The horizontal and vertical dimension of the soft tissues surrounding the rehabilitation placed on the implants in the anterior sector is critical to achieve an optimal result in aesthetics, especially in the maxilla.
Soft tissue defects can be increased with subepithelial connective tissue, which is taken from the palate or retromolar area and its composition consists of connective tissue, sometimes periosteum, and the absence of epithelium [3-5]. The de-epithelialization of the graft allows it to receive double vascularization, therefore, its predictability becomes greater. The sample is taken between the premolar and mesial area of the first molar, 2-3 mm apical to the gingival margin of these teeth. The most frequent complication is the laceration of the palatal artery, resulting in hemorrhage, so it is important that the operator knows very well the anatomy of the area and the treatment of intraoperative complications [6].

VISTA Technique
The modified vestibular incision (VISTA) supraperiosteal tunnel access technique, described by Homa Zade, is performed through sulcular incisions from a subperiosteal approach, and an accessory incision in the frenulum. It is used in connective tissue grafts and provides increased height and width of soft tissues.
This modified technique may cause less soft tissue recession and a favorable ridge change compared to lifting a facial flap. It has been shown in previous studies that elevation of a full-thickness flap can cause bone resorption, and soft tissue recession [12].

Case report
41-year-old female patient suffering from ataxic cerebral palsy and hypothyroidism, controlled by medical indication with 100 mg Levothyroxine every 24 hours. When questioned, allergies to both the local anesthetic and any type of medication were denied, referring to having undergone several dental treatments in the past, such as amalgam fillings, dental extractions and fixed prostheses, currently she wears a 5-unit provisional fixed bridge, with 2 abutments and an edentulous area of 3 units between the upper lateral incisor and both central incisors (Fig. 1 and 2)
It was assessed clinically and a computed tomography of the anterosuperior sector was requested for the surgical planning of implant placement (Fig. 3) and to be able to make the surgical guide.
In the treatment plan, it was decided to carry out in the first instance a periodontal Phase I, which consists of tartar removal, adequate personal plaque control, adequate brushing technique instruction, in conjunction with the use of a Waterpik.
The surgical intervention was planned under sedation, in order to have a less traumatic procedure for the patient.
Clindamycin, Ketorolac and Dexamethasone were administered intravenously, to achieve conscious sedation, Midazolam 5 mg / ml solution for injection, Fentanyl Ethypharm 50 micrograms / ml solution for injection and low

doses of ketamine hydrochloride 50 mg / ml were administered.

Said procedure was followed by a single surgical act in which horizontal guided bone regeneration was performed with the use of collagen membrane (Jason Straumman®) (GBR - horizontal), implant placement (Strauman®) through guided surgery with restrictive marking guide. Implants of the brand Strauman bone level 3.3 x 10 mm were placed, and afterwards a mucogingival surgery of connective tissue graft with VISTA technique took place.

After the surgery, maintenance appointments were given, which consisted of tartar removal and motivating the patient to continue with good hygiene.

Surgery

After the patient's sedation, a 2% lidocaine cartridge with 1: 100,000 epinephrine of 1.8 ml is infiltrated to perform local anesthesia of the infraorbital nerve with reinforcement on the superior denteric nerve. Before the incisions and the elevation of the limb, a test of the surgical marking guide was performed (Fig. 4). A circular incision was made from the distal line angle of the upper right first premolar, followed by an incision in the residual ridge of the anterosuperior sector, continuing with circular incisions again in the upper left lateral organ and ending at the distal line angle of the upper left canine. After lifting a full-thickness flap, vestibular dehiscence were observed in the anterior area, even so, the surgical drilling protocol was carried out (Fig. 5) according to the manufacturer's instructions for implant placement and rectifying the position. With the parallelism pins (fig 6), after each drill used, the implants were then placed, both of which were 3.3x10 mm from the Straumann brand. with a lyophilized allograft (particulate bone) from the Biograft brand (fig 7). Prior to the placement of the bone graft, the pericardial membrane (Jason Straumman®) was fixed with fixation screws, together with its preparation and attachment (Fig. 8), after the membrane was fixed, and the placement of the bone graft, the flap was repositioned without tension, and a primary closure was obtained with a 5-0 Vicryl suture, and simple stitches on the straight incision in the residual ridge, and simple interrupted stitches on the papillae adjacent to the dental organs involved (Fig. 9) A final X-ray was taken to control and corroborate its correct placement and stability. (fig 10).

Healing was meticulously monitored, washing with physiological saline to control biofilm, at 7 and 15 days (Fig. 11), at which point the stitches were removed. One month later, a fixed prosthesis was made provisionally, with abutments in the Dental Organ (DO) 13 and 22 (fig 12). After 4 months, the final fixed prostheses on implants were made.

Given that the anterosuperior sector is an area of high aesthetic demand, a second surgical intervention was chosen around the implants to improve the aesthetic situation and thickness of the adjacent soft tissues, in which by means of the VISTA technique, with two angled vertical incisions (Fig. 13) a partial thickness tunnel was made, in which the receptor bed (Fig. 14), where a subepithelial connective tissue graft obtained from the palate was placed, with a VISTA technique, with an extension of DO 13 to 23 (fig. 15 and 16). In order to improve the healing of the adjacent soft tissue and improve the thickness of the ridge, the Platelet Rich Fibrin (PRF) technique was used (Fig. 17), above the subepithelial connective tissue. The lateral incisions were made with simple interrupted 5-0 Vycril suture stitches (Fig. 18). 3 appointments were followed, 7, 14 and 21 days after the intervention, removing the stitches at 14 days.

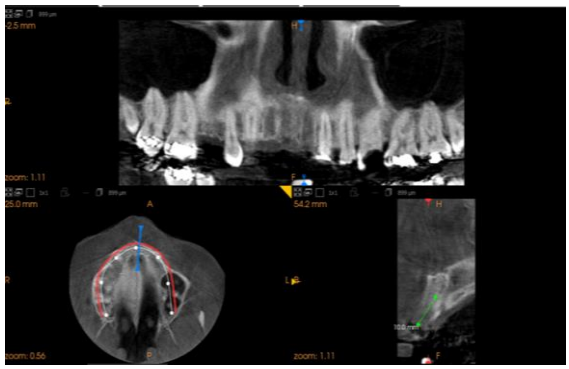
In every procedure, postoperative indications were given, medication (antibiotic and analgesic) and 0.12% Chlorhexidine rinses as an adjunct to plaque control.

Results

Four months after soft tissue healing from the last surgical intervention, implant rehabilitation was ordered and followed up, observing good plaque control (Fig. 19 and 20). Three years after the last surgery, the area of the regeneration and the connective tissue graft remains stable. (fig. 21 and 22).

Fig 1: Initial preoperative photo with a provisional crowns from DO 13 to 12.

Fig 2: Oclussal view



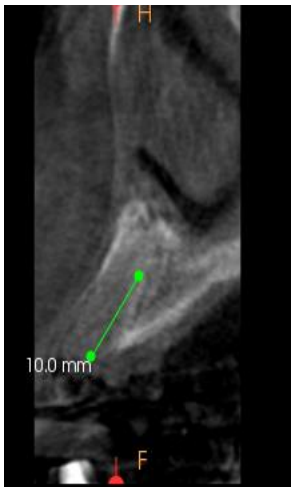


Fig 3: Surgical planning with the tomography

Fig 4: Restrictive guide test for marking with the pilot bur.

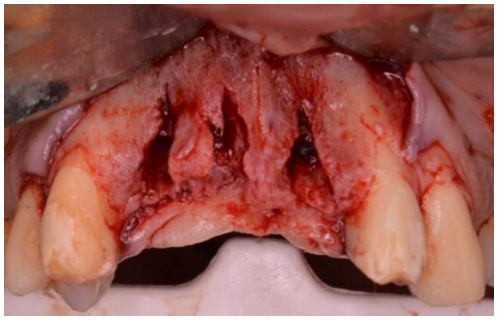


Fig 5: Flap elevation and drilling protocol.

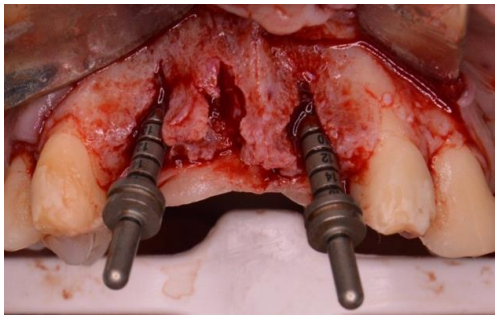


Fig 6: Paralelism pins

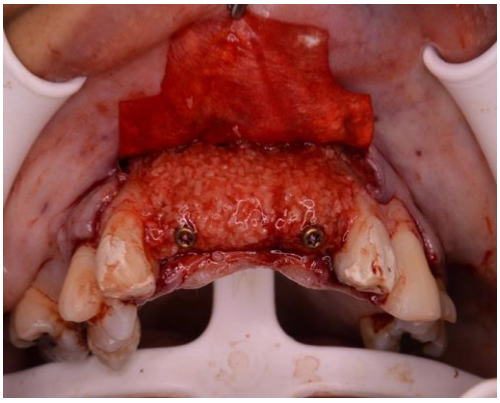


Fig 7: GBR with particulate graft with Jason Straumman membrane.

Fig 8: Jason Straumman ® membrane placed

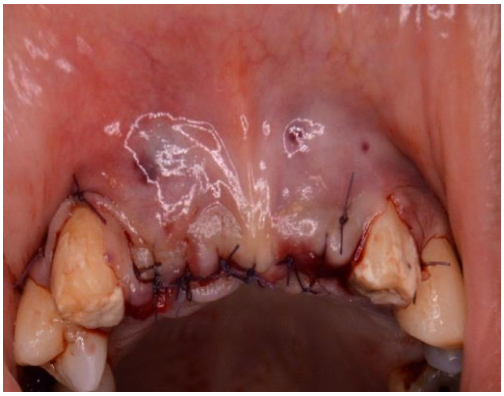


Fig 9: Primary closure.

Fig 10: Final radiography

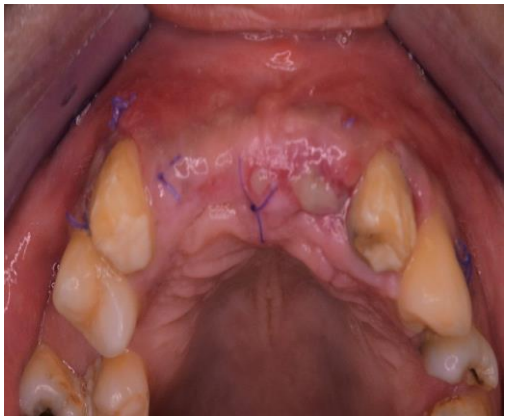


Fig 11: 15 days cicatrization

Fig 12: One month healing and provisionalization.

Fig 14: Tunneling

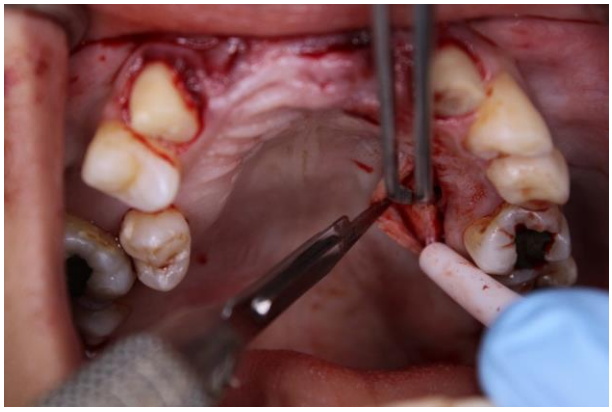


Fig 15: Conective tissue graft taking.

Fig 16: Conective tissue graft in the receiving bed before being placed.

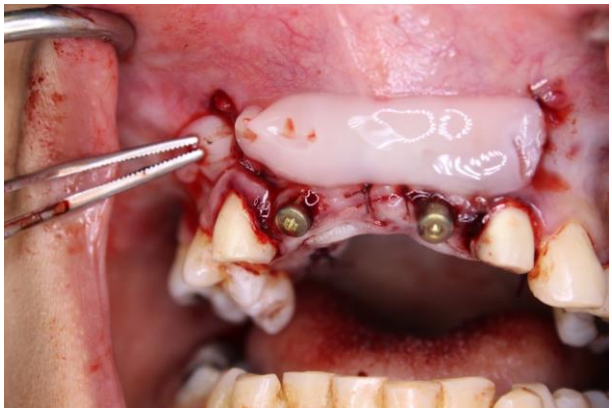


Fig 17: Membrane of fibrine in order to improve healing.

Fig 18: Primary close in the conective tissue graft surgery.

Fig 19: Definitive rehabilitation.

Fig 20: Extraoral photo with definitive rehabilitation.

Fig 21: Three years follwing the last surgery, definitive crowns and periodontal tissues are stable.

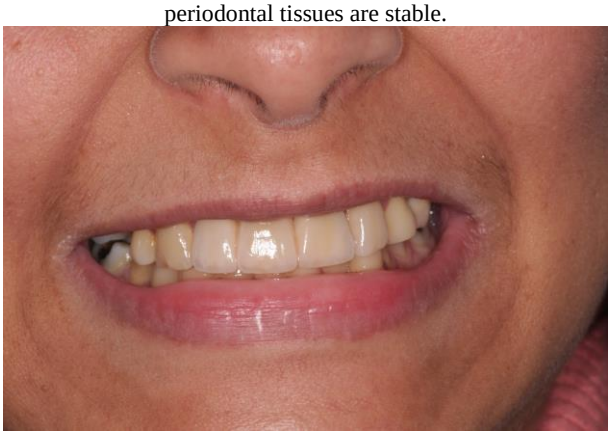


Fig 22: Three years follow up smile.

Discussion

Implantology nowadays represents a very predictive treatment in the replacement of missing teeth. With newer technology and scientific breakthroughs, more dental treatments have become available. Said treatments offer better aesthetic results, as described by different researchers.

In this case we chose what we thought were the best options by the systemic conditions of the patient and the aesthetic needs that the anterior sector requires, at the same time to create the ideal conditions to the implant placement and the rehabilitation, such as the GBR, the immediate colocation of dental implants and the connective tissue graft by VISTA technique, before definitive crowns were placed.

Conclusion

Dental implants are a good, natural, aesthetic and comfortable alternative for the partially and totally edentulous patient, offering numerous treatment options with predictable results.

The multidisciplinary treatment plan of systemically compromised patients is of utmost importance for an optimal result. In this case, the main objective of the treatment was to restore periodontal health, function to the stomatognathic apparatus and meet the aesthetic needs of the patient and her guardian, for which surgical treatment with implants and the improvement of the appearance of soft tissues was proposed by means of the subepithelial connective tissue graft with the VISTA Technique, achieving adequate results for the case. The success of the treatment was based on the correct diagnosis and adequate planning, as well as the commitment of the tutors responsible for the patient.

Conscious sedation is an excellent option for the management of systemically compromised patients. Acceptance by patients with aversion to surgical therapy or fearful of any intervention is high.

Undoubtedly, the correct planning of a case and the anticipation of the complications and challenges of the case lead us to a better management of complicated cases and a better prediction of success in the treatment we are looking for.

References

1. Hernández A, López M. Regeneración ósea guiada simultánea a la colocación de implantes: Presentación de un caso clínico. Rev Odon Mex. 2004;8:32-38.
2. Martínez Alvarez O, Barone A, Covani U, Fernández Ruiz A, Jimenez Guerra A, Monsalve G *et al*. Injertos óseos y biomateriales en implantología oral. Av en Est. 2018;34(0213-1285):111-119.
3. Edel A. Clinical evaluation of free connective tissue grafts used to increase the width of keratinized gingiva. J of Clin Periodontol. 1974;1(4):185-196.
4. Karring T, Cumming B, Oliver R, Löe H. The Origin of Granulation Tissue and Its Impact on Postoperative Results of Mucogingival Surgery. Journal of Periodontology. 1975;46(10):577-585.
5. Wennstrom J. Regeneration of gingiva following surgical excision. A clinical study. J of Clin Periodontol. 1983;10(3):287-297.
6. Reiser G, Bruno J, Mahan P, Larkin L. The subepithelial connective tissue graft palatal donor site: Anatomic considerations for surgeons. Int J Periodontics Restor. 1996;16(2):131-137.
7. Seibert J. Reconstruction of deformed, partially edentulous ridges, using full thickness onlay grafts. Part II. Prosthetic/periodontal interrelationships. Compend Contin Educ Dent. 1984;4(6):549-562.
8. Seibert J. Reconstruction of deformed, partially edentulous ridges, using full thickness onlay grafts. Part I. Technique and wound healing. Compend Contin Educ Dent. 1983;4:437-453.
9. Allen E, Gainza C, Farthing G, Newbold D. Improved Technique for Localized Ridge Augmentation: A Report of 21 Cases. J Periodontol. 1985;56(4):195-199.
10. Reynoso M, Montaner R. Congenital hypothyrodism and ts oral manifestations. Rev Odontol Mex. 2014;18:132-137.
11. Hernández M. Sedación consciente e inconsciente. Anestesiología A. 2004;1:95-97.
12. Lee C, Hamalian T, Schulze-Späte U. Minimally Invasive Treatment of Soft Tissue Deficiency Around an Implant-Supported Restoration in the Esthetic Zone: Modified VISTA Technique Case Report. Journal of Oral Implantology. 2015;41(1):71-76.
13. Koeck B. Prótesis completas. Barcelona: Elsevier, Masson; 2007.
14. Bowen A, Nasimi A, González A, Carmona J. Alternativas estéticas en el tratamiento implantológico del sector anterosuperior. Gaceta dental. 2004;150:64-74.