

ORAL HYGIENE STATUS OF BELL'S PALSY AND DIABETIC PATIENT: A 23-MONTHS IMPLANTS FOLLOW-UP CASE REPORT

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ABSTRACT

Bell's palsy disorder may have a bad significance on oral infections and dental caries predominantly in diabetic patients, mainly through xerostomia experience and facial muscles weakness which were highly associated with food impaction in the vestibule between cheeks and teeth. In addition to that fact of neuromuscular disorders patient's disability to perform good oral hygiene. Moreover, literature has shown that well-controlled diabetes has no or little effect on dental implant survival. This study reports a case of multiple dental implants treatment in bell's palsy and diabetic patient, with 23 months follow-up of this treatment considering oral hygiene evaluation and findings explanation. A 49 years old female patient presented to King Abdulaziz university dental clinics to replace the missing posterior prosthesis. The patient was diagnosed with diabetes type II 10 years ago, and Bell's palsy 20 years ago and she was not satisfied with her teeth which is adversely affected her life quality. The treatment combined restorative treatment, endodontic retreatment, and prosthetic replacement using fiber post-placement, zirconia, lithium disilicate, porcelain fused metal crowns, and two-stage implants placement approach. After 23 months of evaluation, there were positive findings and successful dental implants treatment in such a patient with all these challenging factors. Nevertheless, it was concluded that oral care providers should be aware of the oral manifestations of different disorders to be able to manage the cases and avoid their unfavorable impacts on oral health. Although, oral hygiene instructions (OHI) and monitoring with regular follow-up appointments were highly recommended.

Key words: Bell's palsy, Diabetes, Follow-up, Implant, Oral hygiene.

Introduction

A large number of neuromuscular disorders exist in the maxillofacial and oral regions including bell's palsy which is defined as a sudden occurrence of acute idiopathic peripheral facial nerve paralysis and accounts for about 75 percent of acute facial nerve paralysis [1-4]. The disability to achieve self-cleansing vestibular area and deviation the angle of mouth from the unhealthy side towards healthy side while talking, blowing, whistling, or laughing are features of facial muscles weakness [5]. Successful results of treatment are linked to early diagnosis [6]. However, the percentage of full recovery decreases with the onset attack's increased intensity [4]. Moreover, bell's palsy leads to parageusia, hyperacusis, disordered lacrimation, or salivation were explained in impaired oral hygiene maintenance [7]. Therefore, facially paralyzed patients should be treated during dental treatment with special precautionary measures [3], one of these precautions is that the dentist should pay great attention to set up the prosthesis according to the level of occlusion in oral rehabilitation and not be confused by the asymmetry of the facial and oral cavity [8]. In addition, dental implants have become an efficient and necessary treatment to replace missing teeth [9]. However, the effectiveness of dental implants in monitored diabetic patients should be reasonable with appropriate treatment plans, prophylactic treatments,

and sufficient post-operative monitoring tend to be as effective as normal individuals [10]. A persistent food accumulation is a causative factor of periodontal or peri-implant soft tissue inflammation (bleeding, pain, and edema) around the implant [11]. Consequently, routine follow-up appointments for those patients are highly needed for oral hygiene maintenance [9].

The purpose of this case report was to:

- State oral hygiene status in a controlled diabetic patient who was diagnosed with bell's palsy.
- Follow up multiple dental implants in diabetic and bell's palsy patients after around 2 years.

Case report

Background

A 49 years old Saudi female patient, came to the dental clinic at King Abdulaziz University Hospital, Jeddah, Saudi Arabia. With a chief complaint "I want to return my missing bridge in the lower right side because I can't eat well, it was missing 4 years ago". The patient was diagnosed with diabetes type II 10 years ago, and Bell's palsy 20 years ago, with no allergy. Currently, she is on (Metformin 500 mg) and (Glimepiride 3mg) for diabetes.

The patient reported horizontal vigorous brushing of teeth which resulted in gingival recession. Extra-oral examination demonstrated facial asymmetry when smiling, lip incompetent in rest position (**Figure 1a**). Intra-oral

examination showed dental biofilm-induced gingivitis, multiple missing teeth, secondary caries, and defective restorations with unsatisfactory plaque control.



Figure 1. a) Pre-operative extra-oral and intra-oral photos including forced smile, frontal, lateral and occlusal views. b) Pre-operative OPG.

Subsequently, gathering patient's data was through (Orthopantomogram (OPG), CBCT, mounted casts, smile, and occlusal analysis) (**Figure 1b**). Based on that, the treatment plan was discussed and considered with the patient after taking her written consent and was saved in the patient's document in the hospital. The treatment plan was including replacing defective restorations and missing teeth with dental implants, which is obtained after a diagnostic wax-up, measured bone quantity on Cone-beam computed tomography radiographs, and controlled HBA1C reading (7%).

Case description

The non-surgical phase of the treatment was initiated with adult prophylaxis, scaling, caries excavation, and final restorations #18,15,25,26,28, and 44. Initial preparation of #17 to correct the super-eruption, #45 and 48 with temporization, habit control, and night guard construction. After re-evaluation in 4 weeks and multidisciplinary consultations, non-surgical root canal retreatment of #34 was done. Then, placement of #16,14,46, and 47 Implant fixtures. Proceeding to restorative phase, composite restorations for teeth fractures in #21 and 31, crowns for

#17,34,45,48 and implants crowns of #16,14,46 and 47 were done.

Regarding implants, after administering (articaine 2% with epinephrine) infiltration on buccal and lingual sides of #14,16 and lower right inferior alveolar nerve block, full mucoperiosteal flaps were elevated, implant osteotomy was prepared following surgical guide that was constructed after diagnostic wax-up. Straumann/fast healing slaActive screw coated implants 3.3 by 10 mm were placed on #14,16 and Straumann/fast healing slaActive screw coated implants 4.1 by 10 mm on #46 and 47 with 40N of initial stability. Soft tissues were sutured with multiple interrupted absorbable (VICRYL polyglactin) sutures to achieve adequate healing around the implant (**Figure 2**). Six weeks later, the tissues were completely healed, cover screws were removed and healing abutments were placed. Zirconia screw-retained implant crowns in (#14,16,46,47) were positively seated with post-operative bitewings radiographs. For holes sealing, cotton pellets were placed in the screw holes followed by flowable composite resin restoration. Occlusion was checked by shim stock and articulator paper. Canine guidance was established without interference. Post-

operative photos and radiographs were documented (**Figure 3**).

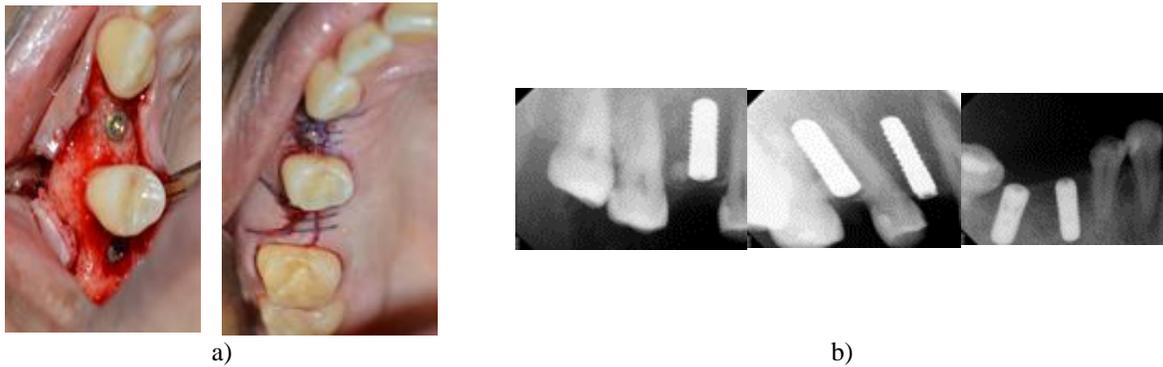


Figure 2. a) Implants placement #14 and 16. b) Implants fixture placement radiographs #14,16,46 and 47.

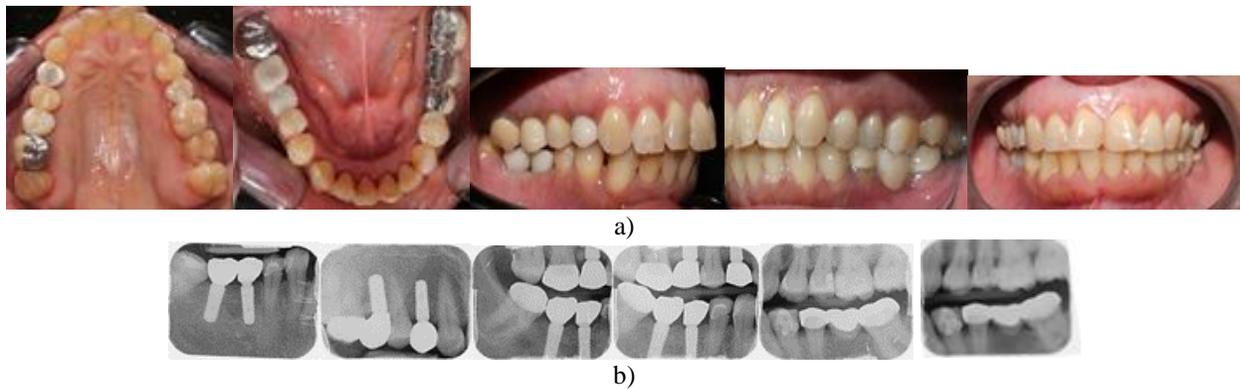


Figure 3. a) Zirconia screw-retained implant crowns #14,16,46 and 47. b) Zirconia screw-retained implant crowns radiographs #14,16,46 and 47.

Bell’s palsy harms oral health, it’s explained in saliva production that has been affected by facial nerve damage [7]. This disorder may have significance on oral infections and dental caries predominantly in diabetic patients through xerostomia experience [12]. The incidence of dental caries in diabetic patients was found to be higher than in healthy individuals, and this was referred to the high glucose level in saliva which was lead to a drop in pH level [13, 14]. In addition, altered taste sensation, hear or lacrimation disturbances, mastication, and speech difficulty will have their negative effects on the patient’s life quality [3, 7]. Moreover, neuromuscular disorders of the face could be associated with saliva drooling at the corners of the mouth that would result in an angular cheilitis [3, 7].

Bhat *et al.* 2010 [5] reported that facial muscles weakness was highly associated with the accumulation of food in the vestibule between cheeks and teeth, mostly orbicularis oris, buccinator, and masseter muscles [5, 8]. The Impaired buccinator and masseter muscles function will lead to plaque

accumulation on the surface of the teeth at the affected side [3]. Adding on that hyposalivation experience that both diabetic and bell’s palsy patients go through; difficulties in speech, taste, and swallowing, as well as bad breath, soft tissue infections, and caries up growth [15, 16]. Reduction in saliva output than normal will play a big role in diminishing the capability of cleansing, remineralization, lubrication, tissue repair, and antimicrobial effects [17]. Consequently, all of these factors will negatively affect oral health status [3]. Therefore, oral health care providers should motivate the facially paralyzed patients and emphasize oral hygiene instructions via recommending interdental brush or dental water jet to aid in flossing instead of regular floss in addition to the electric brushes to facilitate a limited self-cleansing feature, prescribe Biotine or sugar-free gums with encouraging those patients to remove the accumulated food in the vestibule by rinsing the mouth directly after each meal (**Figure 4**).

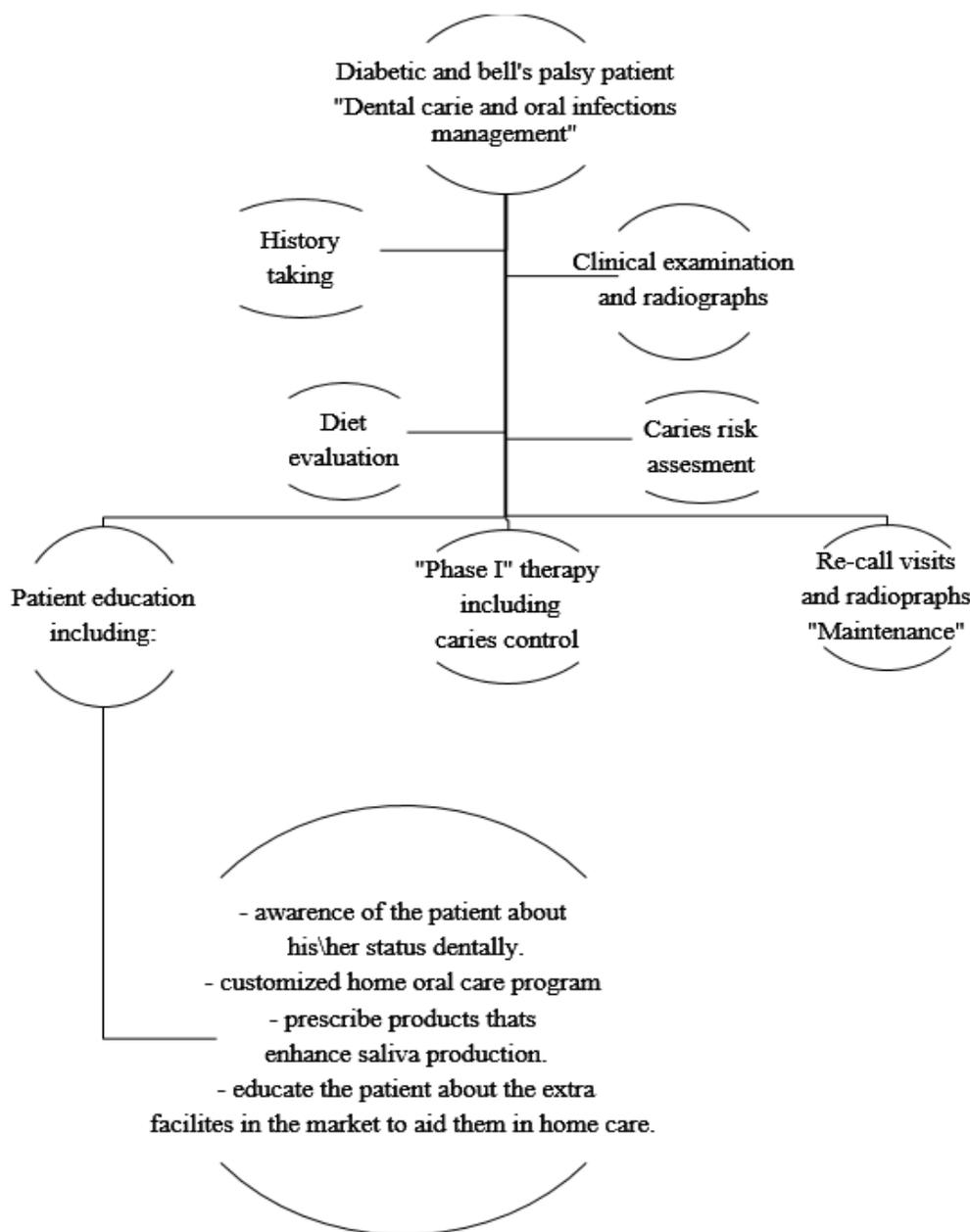


Figure 4. Diabetic patient having bell’s palsy dental caries management protocol that was followed in this reported case.

A recent study by Khator and Motwani, 2019 [3] showed that facially paralyzed patients should be treated with cautions considerations during dental treatment. To illustrate, dentists have to be aware of a symmetry manifestation of this disorder to ensure the correct occlusal scheme reproduction in rehabilitation treatment.

Tom Shokri and *et al.* last study, 2020 [18] showed that facial paralysis management trends were mainly nonsurgical or with no treatment -like the patient in this case report-. Nevertheless, they found some other studies still follow

other protocols such as pharmacotherapy, surgical therapies, physiotherapy, or even chemodenervation.

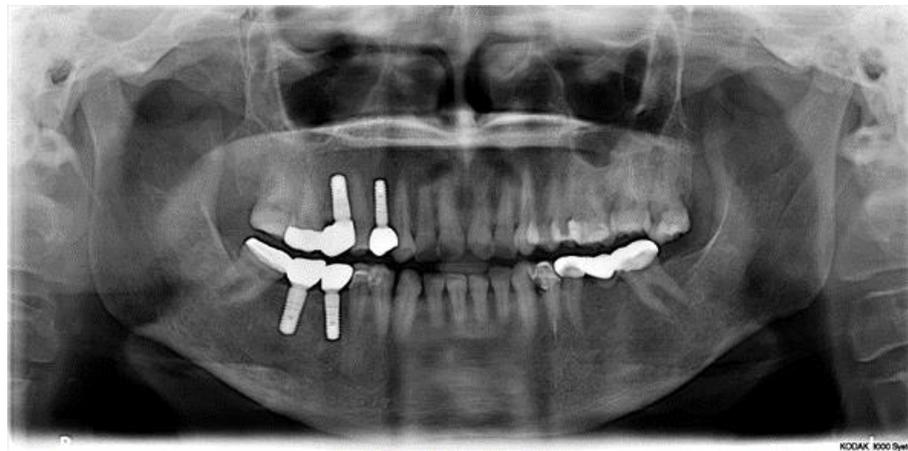
This paper reports a case of a patient presented to King Abdulaziz university dental clinic who was diagnosed with bell’s palsy twenty years ago, and replacement treatment of missing teeth was needed, in addition to her controlled diabetes status from 10 years. Regarding all of these facts about the impacts of bell’s palsy on oral health conditions, her chief complaint was managed in the clinic mainly by implants and prosthesis after educating the patient about her

oral status, oral hygiene instructions and clarify the facilities that are available in the market for oral care.

Many studies were reported that survival of dental implants in well-controlled diabetic patients shows as good results as healthy individuals [10, 19, 20], with adequate post-operative follow-up [10]. However, continual trapping of food particles may lead to peri-implantitis [11]. In these circumstances, it was essential to persist with constant follow-up visits based on the challenging factors that we dealt with in the case; facial palsy condition, diabetes, and high caries risk patient.

Eight months later, the first follow-up visit existed for oral hygiene maintenance and evaluation of implants and prosthesis status. Patient-reported some difficulties in brushing. Endo re-treatment of #34 was evaluated with no signs or symptoms clinically and radiographically. In regards to a prosthesis, all were fit without any marginal catch detected or recurrent caries and occlusion was checked. The soft tissue texture around implants, color, and

amount of keratinized tissue was noted. Nevertheless, minimal marginal redness was observed. OPG showed normal findings. Based on these findings, reinforcement of OHI was done by showing the patient the proper teeth brushing technique to minimize gingival inflammation (**Figure 5a**). Approximately after 23 months in September 2020, -with taking into account all precautionary measures regarding the COVID-19 outbreak- we were able to conduct the second follow-up visit to evaluate the patient compliance, oral hygiene status, and its impacts on the implants. At this visit, the patient reported no pain or discomfort related to implants treatment or prosthesis. Soft tissue was evaluated for the presence of bleeding, suppuration, or inflammation. Bone levels were assessed via intraoral radiographs and CBCT, findings showed normal status (**Figure 5b**), which gives us positive feedback of successful implant treatment in this case with all including factors that she has. At the end of the appointment, no emergency intervention was required. Thus, oral hygiene instructions were reinforced and the patient will be rescheduled for scaling and fluoride application after the COVID-19 pandemic be over.



a)



b)

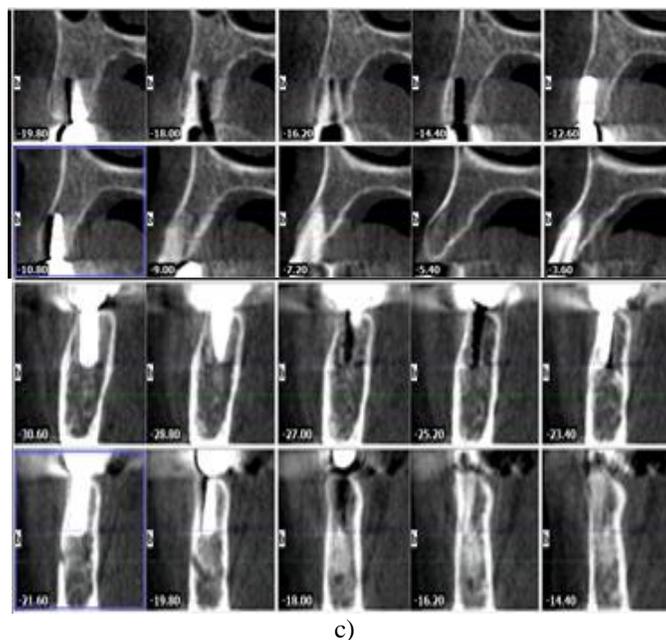


Figure 5. a) 1st follow up-8 months-OPG. b) Second follow up-23 months- intra oral photos, implants PA and BW radiographs. c) implants evaluation on CBCT.

Conclusion

In conclusion, this case reports a successful implant treatment in a diabetic patient who's having bell's palsy after controlling the oral health status and put the patient on the maintenance phase and a well-structured home oral care program. The patient had survived implants, healthy soft tissue around the implants, and a good prosthesis that restores the function. After reporting a case with positive feedback, general practitioners should have well knowledge of facial disorder's oral manifestations and their influence on oral health in terms of preventing and managing unfavorable effects. According to the literature, well-controlled diabetes has no or little effect on dental implant survival. However, to avoid minor complications from becoming irreversible, oral hygiene monitoring and regular follow-up appointments were highly recommended.

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