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INTERVENTION FOR REPLACING MISSING TEETH AT PATIENTS WITH PERIODONTITIS

Mihaela Mitrea[1], Edlibi Al Hage Walid[2], Radu Razvan Maxim[3], Simona Partene Vicoleanu[4], Gabriela Dumachita Sargu[5*], Niculescu Simona[6*], Liliana Loredana Hurjui[7*] , Irina Gradinaru[8], Cristina Claudia Tarniceriu[9], Claudia Florea[10], Norina Consuela Forna[11]

[1]"Grigore T.Popa" University of Medicine and Pharmacy of Iasi, Romania, Faculty of Medicine, Department of Morphological Science I
[2]"Grigore T.Popa" University of Medicine and Pharmacy of Iasi, Romania, Faculty of Dental Medicine, Department of Protheses Technology
[3]"Grigore T.Popa" University of Medicine and Pharmacy of Iasi, Romania, Faculty of Medicine, Department of Morphological Science I
[4]"Grigore T.Popa" University of Medicine and Pharmacy of Iasi, Romania, Faculty of Medicine, Department of Morphological Science I
[5] "Grigore T. Popa" University of Medicine and Pharmacy of Iasi, Faculty of Dentistry Department of Morphological Science I
[6]"Grigore T.Popa" University of Medicine and Pharmacy of Iasi, Romania, Faculty of Medicine, Department of Mother and Child
[7]"Grigore T.Popa" University of Medicine and Pharmacy of Iasi, Romania, Faculty of Medicine, Department of Morphological Science II
[8]"Grigore T.Popa" University of Medicine and Pharmacy of Iasi, Romania, Faculty of Dental Medicine
[9]"Grigore T.Popa" University of Medicine and Pharmacy of Iasi, Romania, Faculty of Medicine, Department of Morphological Science I
[10] Dental Privilege Office, Bucuresti
[11]"Grigore T.Popa" University of Medicine and Pharmacy of Iasi, Romania, Faculty of Dental Medicine, Department of Protheses Technology

Corresponding authors:
Loredana Liliana Hurjui: *loredana.hurjui@umfiasi.ro*
Simona Niculescu: *niculescusimona@yahoo.com*
Gabriela Dumachita Sargu: *sargu_gabriela@yahoo.com*

Abstract: At present, periodontal disease is the main cause of tooth loss, dethroning dental lesions of carious origin. Treatment os always tailored to the case and clinical situation and can range from simple to complex depending on the degree of periodontal damage. The aetiology of periodontitis is multifactorial. Subgingival dental biofilm elicits a host inflammatory and immune response, ultimately leading to irreversible destruction of the periodontium (alveolar bone and periodontal ligament) in a susceptible host. In order to successfully manage periodontitis, dental professionals must understand the pathogenesis, elimination of the causes and reduction of modifiable risk factors and treatment protocols. The technique of immediate implantation hs been widely used to reduce treatment time and bone loss after extraction. Patients with a history of periodontitis represent a unique group of individuals who previously succumbed to a bacterial challenge. Therefore, it was deemed important to address the management and survival rate of implants in these patients.

Key words: aggressive periodontitis, dental implants, immediate dental implantation.

INTRODUCTION

Periodontitis is a chronic multifactorial inflammatory disease associated with the accumulation of dental plaque (dental biofilm/biofilm) and characterized by progressive destruction of the teeth-supporting apparatus including periodontal ligament and alveolar bone [1, 2]. The disease involves complex dynamic interactions among specific bacterial pathogens, destructive host immune responses and environmental factors such as smoking [2, 3]. The common features of periodontitis include gingival inflammation, clinical attachment loss, radiographic evidence of alveolar bone loss, sites with deep probing depths, mobility, bleeding upon probing and pathologic migration [2, 4, 5].

The 2018 classification of periodontal diseases characterizes periodontitis multidimensionally, reflecting disease severity and extent, past disease experience and management complexity and progression using a staging and grading approach [6,7]. Patients are classified into four stages (I-IV) considering the clinical attachment level (CAL) or bone loss (BL) as well as further factors like probing-pocket depths (PPD), type of BL (vertical and/or horizontal), furcation involvement, past disease extent number of teeth lost due to periodontitis and management complexity. Patients are further classified into three grades (A,B,C) determined by the rate of disease progression in the past, the association between oral hygiene and the level of periodontal destruction or the presence of risk factors like smoking and uncontrolled diabetes mellitus. The 2018 classification is assumed to have prognostic value towards future treatment successes and the required treatment efforts, allowing individualized treatment planning [7, 8]. Staging and grading were conducted by, CAL of 1-2 mm defined stage I, 3-4 mm stage II and >5 mm stage III. Then, the number of teeth lost (TL) before T0 was considered (stage I and II: no TL at T0, stage III, TL<4 teeth and stage IV:TL>5 teeth missed at T0). In addition to this severity staging, the complexity of managing, each case was considering via PPD and furcation involvement. Grading was performing using the BL/age index, with grade A being assigned if BL/age was <0,25%, grade B if 0,25-1,00% age and grade C if > 1,00% age Grade A or B could further be modified by smoking (grade B:<10 cigarettes/day or Grade C:>10 cigarettes/day [6, 7, 8].

Placing dental implants in patients with active periodontitis is a procedure that is not subject of a great number of studies. This situation occurs because the local implant sites in periodontal compromised patients are usually colonized by periodontal pathogens at a very early stage of healing suggesting periodontal treatment prior to implant insertion with the aim to reduce the bacterial load [9, 10]. Clinical studies on implant rehabilitation performed in periodontal susceptible patients with loss due to periodontitis report a wide range of long term survival rates, between 70% and 100% [11, 12] but worse performance when compared to periodontal healthy patients: lower survival rate [13, 14], higher margin bone resorption level [15, 16] and a higher frequency of biological complication especially peri-implant pathology [17, 18] situation that combined could mean a success rate as low as 33% at an average follow-up of 8 year [13].

Today the immediate function protocol of dental implants is a valid treatment alternative as reported in several randomized controlled trials [19,20] and a

systematic review [21] with high survival rates in the long-term outcome registered also in clinical studies [22]. Furthermore, it has become a demand from patients especially due to psychological factors and improved quality of live [23].

Immediate function in periodontal untreated sites was proven to also be possible in the short term with a wide range of survival rates reports between 84% and 97,8% and margin bone loss between 1,1 mm and 1,9 mm [24, 25]. A study addressing immediate function of dental implants in periodontal compromised situation reported an implant cumulative survival rate of 91.4% at 5 years [22].

Several authors have placed emphasis on the need for supportive maintenance protocol and or more frequent maintenance appointments in enhancing the probability of a successful outcome [11, 16, 17, and 26]. Moreover, the surface roughness and the existence of a supportive periodontal therapy could also play a role in the outcome of these implant rehabilitations with very sough surface (Sa value>of 3 um) correlated with a higher probability of implant failure and biological complication [16, 27, 28]. Two systematic reviews concluded that implants placed immediately in periodontal compromised sites could achieve a successful osseointegration provided that appropriate clinical procedures were performed before the implant placement including a meticulous cleaning, socket curettage/debridement or chlorhedine 0,12% rinse [29, 30].

High survival rates (100%) and low marginal bone loss (0,5 mm to 1,1 mm) were reported after 1-year of follow-up in studies evaluating the outcome of implants inserted in early or immediate function in post-extraction sockets, including teeth affected by untreated periodontal disease. In these particular studies, high insertion torque control of the inflammatory response and implants with a moderately rough surface, seemed to influence positively the outcome of the rehabilitation [31, 32, 33].

MATERIAL AND METHOD

In the period 2000-2001 a number of 15 patients with marginal periodontitis, of which 3 with stage A marginal periodontitis, 5 with stage B chronic marginal periodontitis and 7 with stage C chronic marginal periodontitis, went to a private dental office. The 5 patients with chronic marginal periodontitis stage B presented stage I and II CAL, TL stage I and II, PDD furcation involvement with BL stage B. The 7 patients with deep chronic marginal periodontitis, stage C presented stage I and II CAL, TL stage III and IV, PDD furcation involvement with BL stage B and C. They were given the treatment protocol all on six and all on six with the non-loading of the 7th and all on four Fast@Fix from Bredent.

The surgical protocol consisted first time in performing a computerized tomography scan (CBCT) to assess bone density in both the maxilla and mandible along with the ratios of the maxillary sinuses to the alveolar ridge and the mandibular canal and chin holes.

The patient was administrated intravenous sedation using fentanyl citrate 0,5 mg/ml injection, diazepam 5 mg/ml injection, as well nitrous oxide, oxygen inhalation. This was in addition to articaine hydrochloride 4% and epinephrine bitartrate 1:100 000 local anesthesia that was administrated in both block and infiltration technique. They also received antibiotics Zinnat (Cefuroxime) 24 hours prior to surgery and 6 days thereafter, corticosteroid medication (Medrol) for control of the inflammatory response was

given daily in a regressive mode (15 mg at surgery, 10 mg on the first 2 days postoperatively and 5 mg in days 3 and 4 postoperatively), anti-inflammatory medication (Ibuprofen 600 mg) was administrated on day 5 postoperatively every 12 hours. Analgesic's were given on the day of surgery and postoperatively for the first 3 days as needed. Before the surgical protocol, each patient's hard and soft deposits were removed by supra- and sub-gingival descaling and professional brushing.

The surgical protocol consisted of the first session for all patients in the extraction of root debris, compromised remaining teeth and a sinus lift where the clinical case required this intervention. In the same meeting, the Fast@Fix protocol from Bredent all on six, all on six was applied with the non-loading of the 7th and all on four. The torque of the implants was higher than 35-40 N/cm, going downwards so as not that of the implant. The multi-units used were hexagonal. After the surgical stage, the temporary work was performed.

RESULTS

One of the cases discussed is the 43-year-old SS patient who went to a private dental office in August of 2021 accusing him of chewing, phonetic and swallowing disorders caused by the multiple infections present at the level of 11,13,14,21,22,23,27,31,32,33,41,42,43 (fig.1).

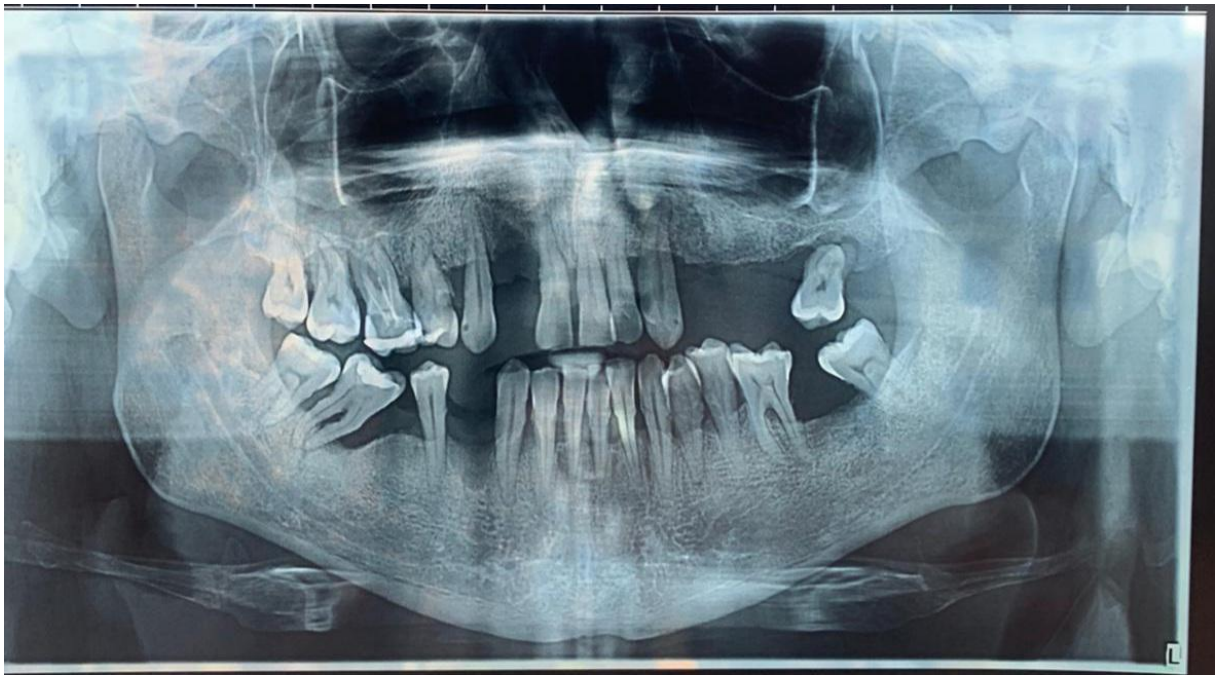

Fig.1. Initial orthopantomography

Following the anamnesis, the patient stated that he is a smoker from the age of 18 of one pack of cigarettes per day, with no heredo-collateral history, with deep periodontopathy stage C, CAL stage III, TL stage IV, PDD furcation involvement with BL stage C, with 2-3 degree mobility and purulent periodontal pockets (4 mm) at the upper and lower frontal group.

In the first session, the removal of the soft and hard deposits was performed by means of the supra-and subgingival descaling and the curettage of the periodontal pockets together with o professional brushing. The patient was recommended to rinse with 2% chlorhexidine antiseptic solutions for a period of 7 days and to appear at the next session for multiple extractions, sinus lift and implant insertion.

In the 2nd session, multiple extractions were affected 12,13,14,15,21,22,23, curettage of the remaining alveoli, sinus lift on the left side and keeping 16,17,27 on the arch to maintain the size vertical of the lower floor. After performing the sinus lift on the left side, bone addition was made with Gen-Oss (OsteoBiol) which is a natural solution that has intimate structures to the human bone (matrix, porosity) with osteoconstructive and biodegradable potential. It is completely resorbable, constituting a support for bone neoformation, but maintaining a constant shape and volume and due to the purity of the collagen; it favors the formation of fibrin-blood clot and subsequently the penetration of repair and regenerative cells. Before being introduced into the created cavity, Gen-Oss (25% cortical bone and 75% sponge bone) was hydrated and mixed with a few drops of blood to activate the collagen matrix and increase its adhesive properties. After hydration, it increased its volume by 50%. On the right side, due to a smaller amount of bone, it was decided to perform an external sinus lift (fig.2).

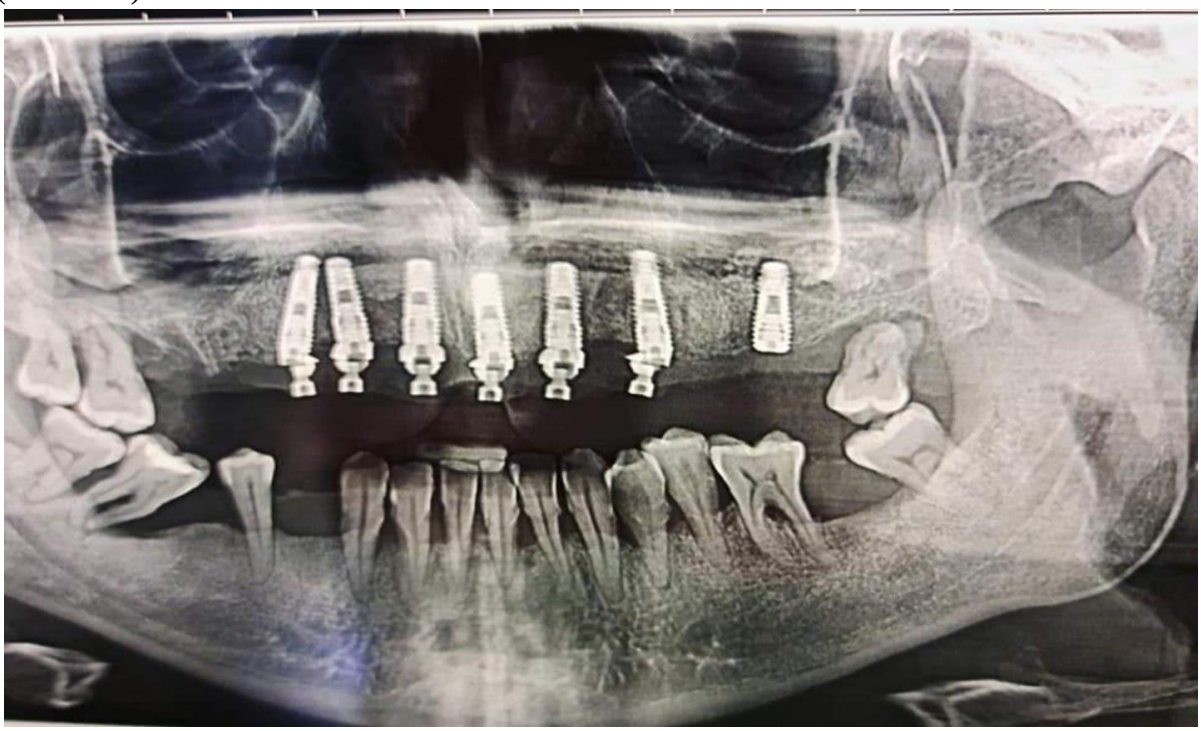

Fig.2. Ortopantomography immediately after sinus lift and insertion of maxillary implants

In order to perform the extractions and subsequently the immediate insertion of the implants, the incision was made on the edge of the ridge, being continued around the teeth, taking off completely extracting the teeth, then during surgery. The torque of the implant must be 35-40 N/cm high for immediate loading. The alveoli being positioned next to each other, it was quite difficult to insert the implants so that it went more palatine (the alveolus being oval and the implant round) the alveolus was filled with Gen-Oss. It was not possible to work with the surgical guide due to the insecurity and

because the immediate loading was wanted, not having time. I did not have much torque in the sinus area because I let it integrate. ,,Free-handed" work was done. The implants used were 3,5/12, 3.5/14 and 4/12 in the sinus area (fig.3, 4, 5, 6).

The validation key with solidarity rods helps us to jump over the errors of inserting the final prosthesis (fig.4).

Fig.3. Paralelism pins for checking the direction of the implants

Fig.4. Multiabutments with rods from the transfer abutments
to check the parallelism of the implants

Fig.5. Gingival conformers with multiunits

Fig.6. The appearance of the gum after the gingival conformers is removed

The impression is taken with the solidarity of the multiunits transfer abutments with dental floss and fluid composite. Solidarity allows for a more accurate footprint to prevent their mobilization in the footprint.

The gingival phenotype is very important in the sense that depending on the structure of the gum, if the gum is thinner, the implant become more clogged, respectively if the gum is thicker, the implant sinks more. In the case of this patient, the gingival phenotype is thick, the implant being clogged 1-2 mm.

Fig. 7. Temporary prosthesis

At the level of the temporary prosthesis, the access holes were filled with Teflon and chitosan composite and then the occlusion was checked again (fig.7). The patient had to leave the country due to the employment contract, seeking to return for a permanent prosthesis.

DISCUSSION

For patients with history of periodontal disease, periodontal maintenance should be provided on a regular and recurrent basis, generally at intervals of 2-6 month [2, 34, and 35]. The appropriate interval should be determined following completion of active peridontal therapy and modified by continuously assessing and individual's risk for periodontitis [2, 35]. Among the factors to be considered are medical history (diabetes), smoking habit, presence of residual sites with deep probing depths, presence of other afore-mentioned contributing factors and the level of home care [2, 36]. A regular recall interval allows timely detection and intervention upon who have been previously treated for periodontis. For example, compared to erratic and non-compliant patient, compliant patients who regularly attended periodontal maintenance therapy exhibited a significantly reduces tooth loss due to periodontitis [2, 36]. During maintenance therapy, periodontal charting should be updated and radiographs obtained as needed. Furthermore, home care should be thoroughly reviewed. For areas

with persistently deep or progressing periodontal probing depths, re-initiating active periodontal therapy (scaling and root planning and periodontal therapy) should be considered [2, 34].

With the introduction of dental implants, a natural tooth with a compromised periodontal prognosis may be extracted and replaced with a dental implant instead of receiving periodontal therapy. Usually implantation immediately after the extraction of teeth with periodontal disease requires the absence of any infection at that level. Certain studies have revealed that immediate implantation in infected socket can also exhibit efficacy if the sockets are thoroughly debrided [37, 38]. Bone graft were needed for these patients and autologous cancellous bone was chosen for ridge preservation because of its excellent osteogenic and osteoinductive properties and its biocompatibility. An autologous CGT (connective tissue graft) and collagen (Bio-Oss) were also used to enhance osteogenesis and wound closure [12, 39]. These studies are in accordance with the treatment protocol used by us in the treatment of the 15 patients with marginal periodontitis in stages A, B and C.

Gianserra at al in a 5-year multicenter retrospective cohort study, assessed the outcome of dental implants in patients with and without a history of periodontitis while implementing regular maintenance regimens which registered no statistically significant difference in implant survival between patients with a history severe periodontitis, mild periodontitis and no periodontitis [14, 40]. Villa and Rangert performed a study on 20 patients rehabilitated with 4 to 6 implants with immediate loading inserted in or close to fresh extraction sockets presenting signs of infection, yielding a survival rate of 100% with a follow-up between 15 to 44 months [32, 41]. Schou et al in two systematic reviews 9one on the outcome of implant therapy in patients with previous tooth loss due to periodontitis and another on the oucome of implants treatment in periodontitis susceptible patients), reported that prosthetic and implant suvival was not significantly different in individuals with periodontitis-associated and non-periodontitis-associated tooth loss and that implant treatment in periodontitis-susceptible patients was not contraindicated, provided there was adequate infection control and an individualized maintenance programs [17, 22, 28]. Palmer in a systematic review reporting implant placement into immediate extraction sites compromised by pathological lesions of endodontic or periodontal origin, concluded that implants could be placed into sites compromised by periapical and peridontal infection following debridement of the site [29, 42].

A systematic review from Chrcanovic at al on immediate placement of implants into infected also stated the advantages of appropriate clinical procedures before implant insertion (meticulous cleaning, socket curettage/debridement), translating in the support of the hypothesis that implants may be successfully osseointegrating when plaved immediately after extraction of teeth presenting endodontic and periodontal lesions as given by the high survival rate obtain in several studies [30].

CONCLUSION

A correct diagnosis, elimination of the causes and reduction of modifiable risk factors are paramount for successful prevention and treatment of periodontitis.

Following the completion of initial non-surgical periodontal therapy predominantly consisting of home care review and scaling and root planning, contemporary regenerative or traditional resective surgical therapy can be utilized to eradicate any residual site with active periodontitis. Thereafter, periodontal maintenance therapy and long-term follow up are also crucial to the success of the treatment and long-term retention of teeth.

Within the limitation of this study, it is possible to conclude that the rehabilitation of patients with untreated periodontitis using immediately loaded dental implants is a treatment option in the medium-term, when periodontal therapy is provided after rehabilitation and the patients are regularly maintained.

REFERENCES:

1. Slots J. Periodontitis: facts, fallacies and the future. Periodontol 2000; 2017:7-23.
2. TaeHyun Kwon, Ira B Lamster, Liran Levin. Concise Clinical Review. Current Concepts in the Management of Periodontitis. International Dental Journal 2021; 71:462-475.
3. Page RC, Offenbacher S, Schroeder HE, Seymour GJ,Kornman KS. Advances in the pathogenesis of periodontitis: summary of developments, clinical implication and future directions. Periodontol 2000; 1997(14):216-248.
4. Papapanou PN, Sanz M, Buduneli N et. Al. Periodontitis report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Disease and Condition. J Periodontol 2018; 89(suppl 1):S173-82.
5. Page RC, Eke PI. Case definitions for use in population-based surveillance of periodontitis. J Periodontol 2007; 16(7 Suppl):1387-99.
6. Tonetti MS, Greenwell H, Kornman KS. Staging and grading of periodontitis framework and proposal of a new classification and case definition. J Clin Periodontol 2018; 45(Suppl 1):149-161.
7. Schwendicke F, Krois J, Anne Sophie Engel, Seidel M, Graetz C. Long-term periodontitis treatment cost according to the 2018 classification of periodontal diseases. Journal of Dentistry 2020; 99:1-5.
8. Caton JG, Armitage GT, Berglunth ILC, Chapple S, Jepsen S, Kornman KS, Mealey BI, Papapanou PN, Sanz M, Tonetti MS. A new classification scheme for periodontal and peri-implant diseases and condition-introduction and key changes from the 1999 classification. J. Clin Periodontol 2018; 45(Suppl 20):1-8.
9. Malo P, Nobre Miguel de Araujo, Lopes A, Ferro A, Gravito I. Immediate loading of implants placed in patients with untreated periodontal disease: a 5-year prospective cohort study. Eur J Oral Implantol 2014;7(3):295-304.
10. Cosgarea R, DannewitzB, Sculean A, Bran S, Rotaru H, Baciut G, Eick S. Bacterial and inflammatory behavior of implants in the early healing phase of chronic periodontits. Quintessence Int 2012; 43:491-500.

11. Rocuzzo M, Bonino L, Dalmasso P, Aglietta M. Long-term results of a three arms prospective cohort study on implants in periodontally compromised patients:10-year data around sandblasted and acid-etched (SLA) surface. Clin Oral Implants Res 2013.
12. Deng F, Zhang H, Zhang H, Shai H, He Q, Zhang P. A comparation of clinical outcomes for implants placed in fresh extraction sockets versus healed sites in peridontally compromised patients: a 1-year follow-up report. Int J Oral Maxillofac Implants 2010; 25:1036-1040.
13. Swierkot K, Lottholz P, Flores-de-Jacoby L, Mengel R. Mucositis, peri-implatitis, implant success and survival of implants in patients with treated generalized aggressive periodontitis:3- to 16-year results of a prospective long-term cohort study. J Periodontol 2012; 83:1213-1225.
14. Gianserra R,Cavalcanti R, Orelia F, Mnafredonia MF, Esposito M. Outcome of dental implants in patients with and without a history of periodontitis: a 5-year pragmatic multicenter retrospective cohort study of 1727 patients. Eur Oral Implantol 2010;3:307-314.
15. Gatti C, Gatti F, Chiapasco M, Esposito M. Outcome of dental implants in partially edentulous patients with and without history of periodontitis: a 5-year interim analysis of a cohort study. Eur J Oral Implantol 2008;1:45-51.
16. Schou S, Holmstrup P, Worthington HV, Esposito M. Outcome of implant therapy in patients with previous tooth loss due to periodontitis. Clin Oral Implants Res 2006;17:S104-S123.
17. Chou-Yan Lee J, Mattheos N, Nixon KC, Ivanovski S. Residual periodontal pockets are a risk indicator for peri-implantitis in patients treated for periodontitis. Clin Oral Implants Res 2012;23:325-333.
18. Rocuzzo M, Bonino F, Aglietta M, Dalmasso P. Ten-year results of a three arms prospective cohort study on implants in periodontally compromised patients. Part 2:clinical results. Clin Oral Implants Res 2012;23:389-395.
19. Canizzaro G, Torchio C, Leone M, Esposito M. Immediate versus early loading of flapless-placed implants supporting maxillary full-arch prostheses: a randomized controlled clinical trial. Eur J Oral Implantol 2008;1:127-139.
20. Merli M, Merli A, Bernardelli F, Lombardini F, Esposito M. Immediate versus early non-occlusal loading of dental implants placed flapless in partially edentulous patients. One-year results from a randomize controlled trial. Eur L Oral Implantol 2008; 1:207-220.
21. Esposito M, Maghaireh H, Worthington HV. Interventions for replacing missing teeth;different times for loading dental implants. Cochrane Database Syst Rev 2013, 28;3
22. Malo P, de Araujo Nobre M. Implants (3,3 mm diameter) for the rehabilitation of edentulos posterior regions : a retrospective clinical study with up to 11 years of folow-up. Clin Implant Dent Relat Res 2011;13:95-103.
23. Malo P, Rangert B, Dvarsater L. Immediate function of Branemark implants in the esthetic zone: a retrospective clinical study with 6 months to 4 years of following-up. Clin Implant Dent Relat Res 2011;13:95-103.

24. Capelli M, Esposito M, Zuffetti F, Galli F, Del Fabbro M, Testroi T. A 5-year report from a multicentre randomized clinical trial:immediate non-occlusal versus early loading of dental implants in partially edentulous patients. Eur J Oral Implantol 2010;3:209-219.
25. Arnhart C, kielbasa AM, Martinez-de Fuentes R, Goldstein M, Jackowski J, Lorenzoni M, Maiorana C, Meriscke-Stern R. Pozzi A, Rompen E, Sanz M, Strub JR. Comparison of variable-thread tapered implant designs to a standard tapered implant design after immediate laoding. A 3-year multicentre randomized controlled trial. Eur J Oral Implantol 2012; 5:123-136.
26. Malo P, Nobre Mde A, Lopes A. Immediate rehabilitation of completely edentulous arches with a four-implant prosthesis concept in difficult conditions: an open cohort study with a mean follow-up of 2 years. Int J Oral Maxillofac. Implants 2012;27:1177-1190.
27. Karoussis IK, Kotsovilis S, Formousis I. A comprehensive and critica review of dental implant prognosis in periodontally compromised partially edentulous patients. Clin Oral Implants Res 2007;18:669-679.
28. Schou S. Implant treatment in periodontitis-susceptible patients: a systematic review. J Oral Rehabil 2008;35:9-22.
29. Palmer R. Evidence for survival of implants place dinto infected sites is limited. J Evid Based Dent Pract 2012;12:S187-S188.
30. Chrcanovic BR, Martins MD,Wennerberg A. Immediate placement of implants into infected sites: A systematic review. Clin Implant Dent Relat Res 2013.
31. Cornelini R,Cangini F,Covani U,Wilson TG Jr. Immediate restoration of implants placed into fresh extraction sockets for single-tooth replacement: a prospective clinical study. Int J Periodontics Restorative Dent 2005;25:439-447.
32. Villa R, Rangert B. Early loading of interforaminal implants immediately installed after extraction of teeth presenting endodontic and periodontal lesions. Clin Implant Dent Relat Res 2005;7:S28-S35.
33. Malo P, de Araujo Nobre M, Rangert B. Implants placed in immediate function in periodontally compromised sites : a five-year retrospective and one-year prospective study. J Prosthet Dent 2007;97:S86-S95.
34. Cohen RE. Research, Science and Therapy Committee. American Academy of Peridontology. Position paper: periodontal maintenance. J Periodontol 2003;74:1395-13401.
35. Surveillance Report 2018-Dental Checks. Interval between Oral Health reviews (2004) NICE Guideling CG19. London:National Institute for Health and Care Excellence (UK).
36. Mills MP, Rosen PS, Chambrone L et al. American Academy of Periodontology best evidence consensus statement on the efficacy of laser therapy used alone or as an adjunct to non-surgical treatment of peridontitis and peri-implant disease. J Periodontol 2018;89:737-742.
37. Waasdorp JA, Exton CL,Mandracchia M. Immediate placement of implants into infected sites:a systematic review of the literature. J Periodontol 2018;81:801-808.
38. Jofre J, Valezuela D, Quintana P,Asenjo-Lobos C. Protocol for immediate implant replacement of infectected teeth. Implant Dent 2012;287-294.

39. Mir-Mari J, Mir-Orfila P, Valmaseda-Castellon E, Gay-Escoda C. Long-term marginal bone loss in 217 machined-surface implants placed in 68 patients with 5 to 9 years of follow-up: a retrospective study. Int J Oral Maxillofac Implants 2012;1163-1169.
40. Pertea M, Grosu OM, Veliceasa B, Vlenciuc N, Ciobanu P, Tudor R, Poroch V, Lunca S. Effectiveness and safety of wide awake local anesthesia no tourniquet (WALANT) technique in hand surgery. Rev Chimie 2019;70(10):3587-3591.
41. Alexa O, Gheorghevici ST, Popescu D, Veliceasa B, Alexa ID. Survval of nonagenarian patients with hip fractures: a cohort study. Acta Ortop Bras 2017;25(4):132-136.
42. Alexa O, Veliceasa B, Malancea R, Alexa ID. Posteoperative cognitive disordes has to be included within informed consent of elderly patiens undergoing total hip replacement. Revista Romana de Bioetica 2013; 11(4):40-49.