ImplantsCM
Cone Morse

REFERENCE BOOK

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Neodent Overview - Scientific Book

Our main purpose with the Dental Community goes beyond the production of quality proven products, certified and approved by the main governmental regulatory affairs bureaus worldwide. We provide innovative solutions that allow you to deliver high quality treatment to patients.

Neodent commitment outside investments on the search of the best implant macro design, the outstanding piece of the art implant surface and the finest implant-abutment connection adapted to the Dentists need and the patient biology. Neodent aim is to provide innovative and affordable products, based in scientific proven facts blended to essential clinical requirements. Consequently it is part of this company culture, since its foundation 22 years ago, to endow Dental science and to support researches and Universities.

The present manuscript is an effective and practical reference book of scientific researches based on Neodent products. Our objective is to present the main results and conclusions of studies selected from our team driven, to our daily practice as implantologists and the treatment of patients. Also our purpose is to praise honest researchers who dedicated time and work to their passion, truly motivated by questions and suspicions.

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The present refence book was divided in 5 sections:

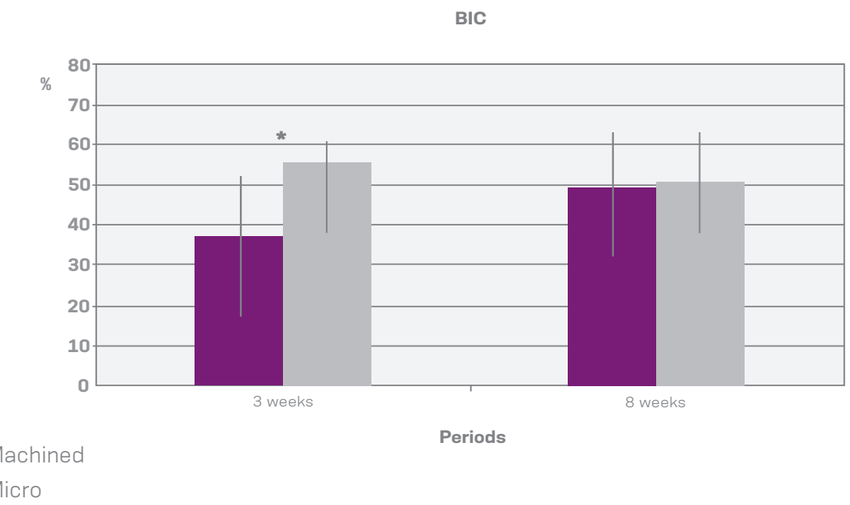
BRAZILIAN DENTAL JOURNAL

Brazilian Dental Journal

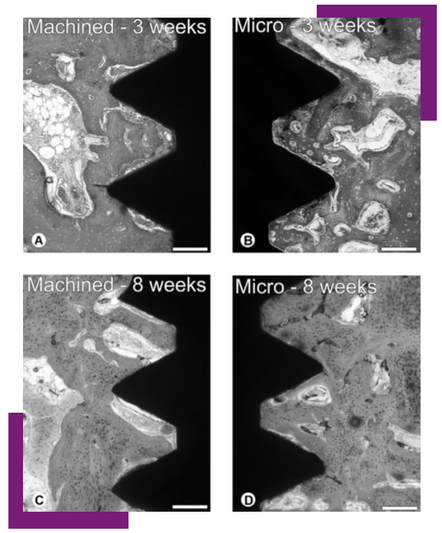
1. Xavier SP, Ikuno KE, Tavares MG. Enhanced bone apposition to Brazilian microrough titanium surfaces. Braz Dent J. 2010 Jan;21(1):18-23.

Abstract:

It has recently been reported that machined and microrough (micro) Brazilian titanium (Ti) implants have good production standards. The aim of this study was to evaluate in vivo bone formation around 2 different implant surfaces placed in dog's mandible. Thirty-two screw-typed Ti implants were used in this study. Mandibular premolars were extracted in 8 dogs and, after 12 weeks, 2 machined (Neodent Titamax, Brazil) and 2 micro implants (Neodent Titamax Porous, Brazil) were placed in each animal. Biopsies were taken at 3 and 8 weeks post-implantation and stained with Stevenel's blue and Alizarin red for histomorphometric measurements of bone-to-implant contact (BIC), bone area between threads (BABT) and bone area within the mirror area (BAMA). Data were analyzed statistically by two-way ANOVA (alpha=0.05). While at 3 weeks micro implants exhibited significantly more BIC than machined ones (55 +/- 12.5% and 35.6 +/- 15%, p<0.05), no significant difference in such parameter was detected at 8 weeks (51.2 +/- 21% and 48.6 +/- 18.1%, p>0.05). There were no significant differences in BABT and BAMA between the implants. Micro surfaces promoted higher contact osteogenesis. **These data indicate that this commercial micro Ti implant surface enhances contact osteogenesis at an early post-implantation period when compared to the machined one.**



Percentage of bone-to-implant contact (BIC; mean + SD) for machined and micro surfaces at 3 and 8 weeks.* Significant (p<0.05).



Mesiodistal ground sections of machined (A,C) and micro (B,D) Ti implants and the surrounding connective tissues at 3 (A,B) and 8 (C,D) weeks postimplantation. At 3 and 8 weeks, lamellar bone trabeculae and bone marrow were observed in close contact with machined surfaces (A,C), whereas a continuous, thin layer of newly formed bone, which was connected to trabeculae of lamellar bone, was observed in intimate contact with micro surfaces.

2. Alves MLM, Iwaki Filho L, Sábio S, Zen Filho EV, Soares S. Avaliação da estabilidade de implantes curtos Neodent, tipo Cone Morse, por meio do teste do torque reverso: estudo preliminar em coelhos / Assessing stability of Neodent Morse taper implants through reverse torque technique testing: a preliminary study in rabbits. Dent press implantol. 2014 Oct-Dec;8(4): 94-101.

Introduction:

Several types of implants are available on the market, including internal or external hexagonal connections and the Morse Taper connection. The latter provides better distribution and transmission of forces throughout the implant. Implant osseointegration can be measured and assessed by reverse torque.

Objective:

The objective of this study is to test, in Morse Taper implants installed in rabbit's tibia, the feasibility of a new reverse torque assessment method.

Methods:

Neodent Morse Taper WS implants were installed in rabbit's tibia. The animals were sacrificed at different periods of time. The bone blocks containing the implants were cut, and a corresponding mounting device was attached to the implant, forming a single pillar. Reverse torque was simulated using a universal testing machine EMIC DL 1000. Compressive force was applied to the arm of the ratchet.

Results:

The values obtained with the test were: Rabbit 1 (immediate)= 1.8 Kgf, Rabbit 2 (7 days) = 7.6 Kgf, Rabbit 3 (15 days) = 17 Kgf, Rabbit 4 (30 days)=27Kgf, and Rabbit 5 (45 days) = 36 Kgf.

Conclusion:

Results were promising as they indicated an increase in the value of reverse torque over time.

Rabbit 1 (immediate) = 0,18kgf, or 1,76N;

Rabbit 2 (7 days) = 0,76kgf, or 7,45N;

Rabbit 3 (15 days) = 1,7kgf, or 16,67N;

Rabbit 4 (30 days) = 2,7kgf, or 26,48N;

Rabbit 5 (45 days) = 3,6kgf, or 35,30N.

3. Sartori IAM, Latenek RT, Budel LA, Thomé G, Bernardes SR, Tiossi R. Retrospective analysis of 2,244 implants and the importance of follow-up in implantology. JDR. 2014;2(6): 555-565.

Aim:

A retrospective clinical analysis evaluated the clinical behavior of the prosthetic restorations, screw joint stability, peri-implant bone level and soft tissues, implant survival rate and patient satisfaction.

Material and methods:

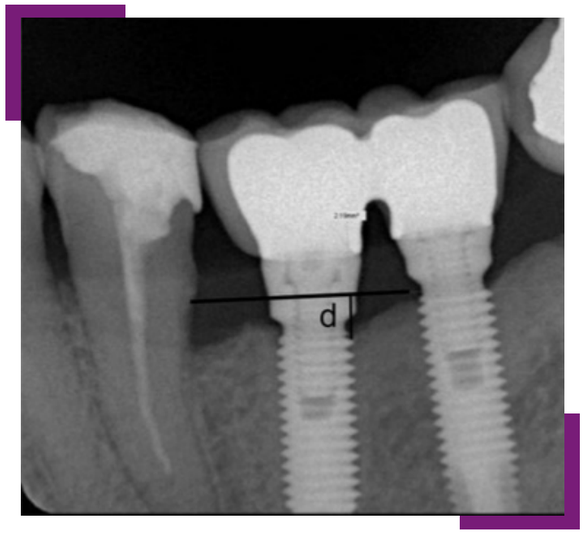
Data was collected from follow-up visits of 444 patients, aged from 26 to 88 years, that were rehabilitated with 2,244 implants (Neodent) placed between 2005 and 2010.

Results:

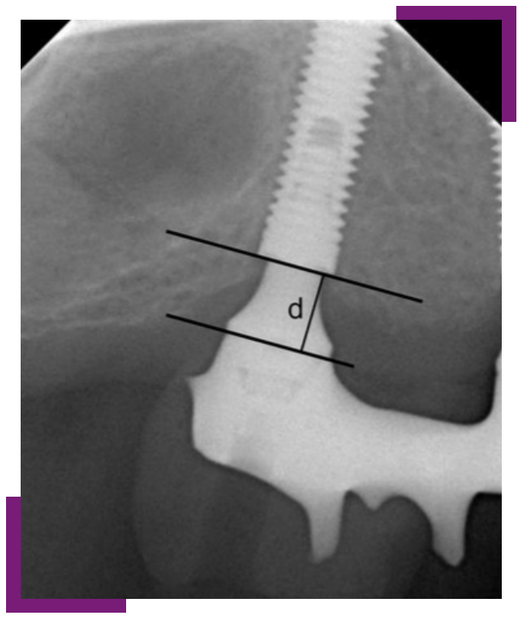
The implant survival rate was 99.73%, 94.78% for prosthetic screws, and 96.70% for abutment screws. Peri-implant bone levels remained stable (bone loss equal or less than 1 mm) in 96.21% of the implants. Plaque accumulation was present in 275 patients and was associated with gingival bleeding in 66 patients. Three hundred and thirty patients were satisfied, 103 were somewhat satisfied, 7 patients expected more from their restorative treatment, and 4 patients were dissatisfied.

Conclusion:

Continuous follow-up of patients with implant restorations provides essential information on the behavior of implants and prosthetic components, enabling the early intervention in minor prosthetic complications (e.g. screw loosening) to avoid future major complications (e.g. implant failure).



Evaluation of the peri-implant bone level - X-ray of Morse taper implant. d=measured vertical bone loss.

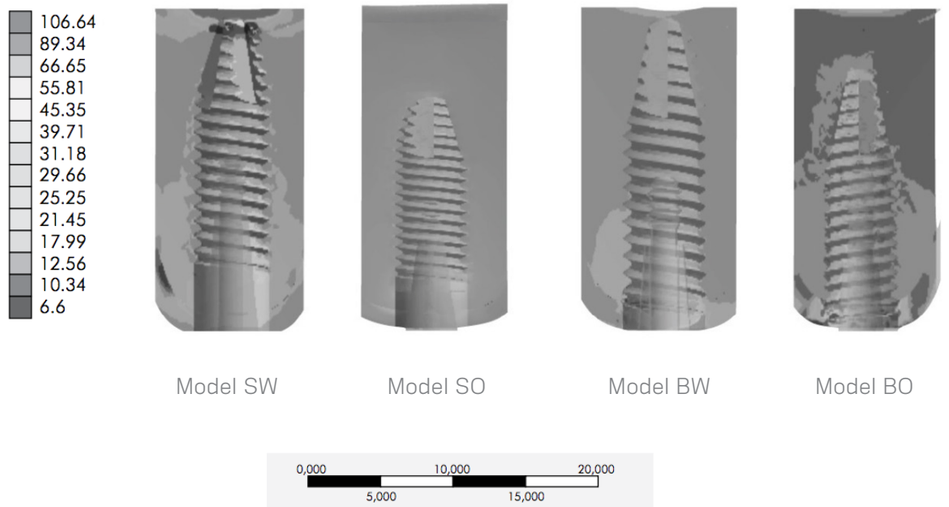


Evaluation of the peri-implant bone level - X-ray of External Hexagon implant. d=measured vertical bone loss.

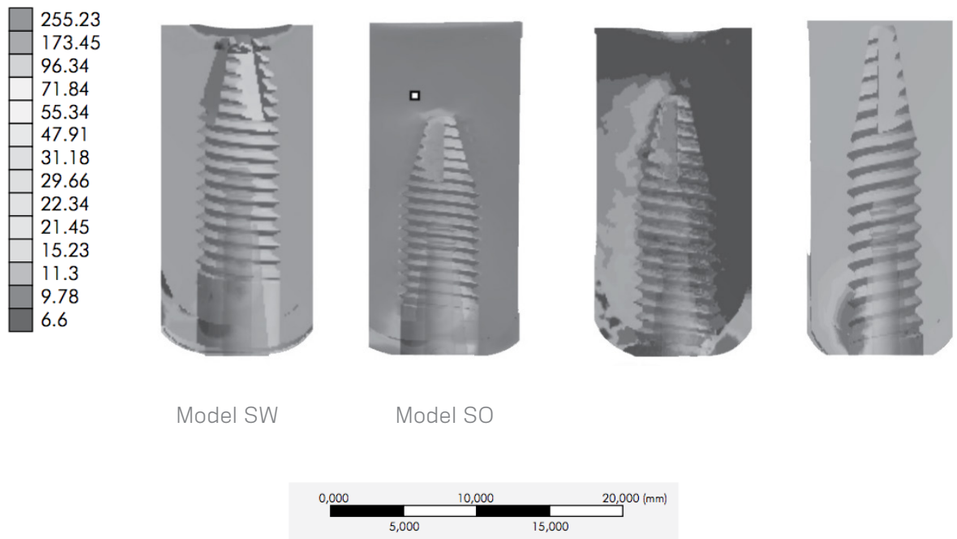
4. Sotto-Maior BS, Lima Cde A, Senna PM, Camargos Gde V, Del Bel Cury AA. Biomechanical evaluation of subcrestal dental implants with different bone anchorages. Braz Oral Res. 2014;1(28):1-7.

Abstract:

This study evaluated the biomechanical influence of apical bone anchorage on a single subcrestal dental implant using three-dimensional finite element analysis (FEA). Four different bone anchorage designs were simulated on a posterior maxillary segment using one implant with platform switching and internal Morse taper connection (Neodent CM) as follows: 2 mm subcrestal placement with (SW) or without (SO) the implant apex engaged into the cortical bone or position at bone level with anchorage only in the crestal cortical (BO) bone or with bicortical fixation (BW). Each implant received a premolar crown, and all models were loaded with 200 N to simulate centric and eccentric occlusion. The peak tensile and compressive stress and strain were calculated at the crestal cortical, trabecular, and apical cortical bone. The vertical and horizontal implant displacements were measured at the platform level. FEA indicated that subcrestal placement (SW and SO) created lower stress and strain in the crestal cortical bone compared with crestal placement (BO and BW models). The SW model exhibited lesser vertical and horizontal implant micromovement compared with the SO and BO models under eccentric loading; however, stress and strain were higher in the apical cortical bone. The BW model exhibited the lowest implant displacement. **These results indicate that subcrestal placement decreases the stress in the crestal cortical bone of dental implants, regardless of apical anchorage; however, apical cortical anchorage can be effective in limiting implant displacement. Further studies are required to evaluate the effects of possible remodeling around the apex on the success of subcrestal implants**

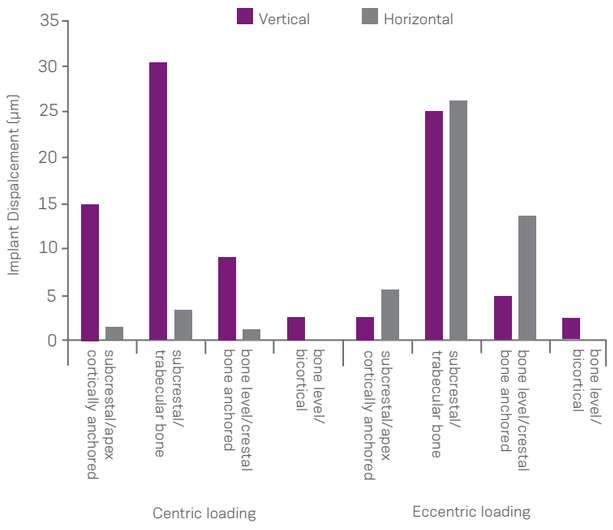


Compressive stress (MPa) around implants with different anchorage designs under centric loading.



Compressive stress (MPa) around implants with different anchorage designs under eccentric loading.

Region	Model	Peak tensile stress	Peak compressive stress	Strain
Crestal cortical bone	subcrestal/ apex cortically anchored	86.8	56.8	0.0045
	subcrestal/ trabecular bone	24.6*	34.1	0.0016*
	bone level/ crestal bone anchored	67.4	119.2*	0.0048
	bone level/ bicortical	66.6	127.4	0.0038
Trabecular bone	subcrestal/ apex cortically anchored	85.2	65.6	0.2210*
	subcrestal/ trabecular bone	39.0	54.3	0.1460
	bone level/ crestal bone anchored	60.9	46.3	0.0750
	bone level/ bicortical	12.9*	17.6*	0.1079
Apical cortical bone	subcrestal/ apex cortically anchored	124.2*	527.8*	0.0167*
	subcrestal/ trabecular bone	6.6	6.7	0.0026
	bone level/ crestal bone anchored	14.4	14.9	0.0005
	bone level/ bicortical	24.3	61.5	0.0014



Vertical and horizontal implant displacement (µm) during centric and eccentric loading simulations.

5. Piozzi R, Ribeiro DA, Padovan LE, Nary Filho H, Matsumoto MA. Genotoxicity and cytotoxicity in multiple organs induced by titanium miniplates in Wistar rats. J Biomed Mater Res A. 2009 Feb;88(2):342-7.

Abstract:

Internal fixture materials are currently used as metallic biomaterials in rehabilitation of human body. Nevertheless, metal release due to corrosion phenomena appears to play a crucial role for human health. Thus, the goal of the present study was to evaluate whether liver, kidney, and lung are particularly sensitive organs for DNA damaging and cytotoxicity following implantation of internal fixture materials (Neodent, Curitiba, Brazil) composed by titanium alloy in vivo. A total of 18 rats underwent surgical titanium miniplates in their tibias, being randomly distributed into three groups: 30 days, 90 days, and 180 days after implantation. A total of six animals served as negative control (animals that not received any implant). After experimental design, the lung, liver, and kidney were removed for histopatological and genotoxic analysis as depicted by H.E. stain and single cell gel (comet) assay, respectively. No significant statistically differences ($p > 0.05$) for DNA damaging were found to all experimental groups when compared to negative control for all organs evaluated. In addition, no remarkable morphological alterations were detected under histopathological analysis. **Taken together, such results suggest that titanium miniplates are neither able to induce DNA damage in multiple organs nor to cause some abnormalities in lung, liver, and kidney.**

6. Sartoretto SC, Alves AT, Resende RF, Calasans-Maia J, Granjeiro JM, Calasans-Maia MD. Early osseointegration driven by the surface chemistry and wettability of dental implants. J Appl Oral Sci. 2015 May-Jun;23(3):279-87.

Objective:

The objective of this study was to investigate the impact of two different commercially available dental implants on osseointegration. The surfaces were sandblasting and acid etching (Group 1, Neoporos, Neodent) and sandblasting and acid etching, then maintained in an isotonic solution of 0.9% sodium chloride (Group 2, Acqua, Neodent).

Material and methods:

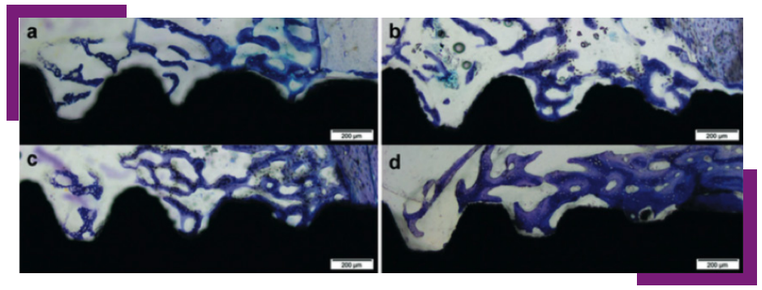
X-ray photoelectron spectroscopy (XPS) was employed for surface chemistry analysis. Surface morphology and topography was investigated by scanning electron microscopy (SEM) and confocal microscopy (CM), respectively. Contact angle analysis (CAA) was employed for wetting evaluation. Bone-implant-contact (BIC) and bone area fraction occupied (BAFO) analysis were performed on thin sections (30 µm) 14 and 28 days after the installation of 10 implants from each group (n=20) in rabbit`s tibias. Statistical analysis was performed by ANOVA at the 95% level of significance considering implantation time and implant surface as independent variables.

Results:

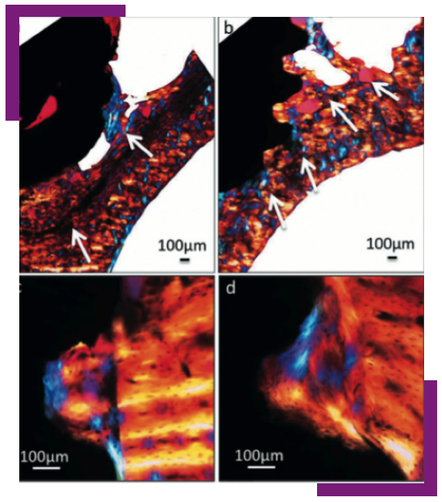
Group 2 showed 3-fold less carbon on the surface and a markedly enhanced hydrophilicity compared to Group 1 but a similar surface roughness ($p>0.05$). BIC and BAFO levels in Group 2 at 14 days were similar to those in Group 1 at 28 days. After 28 days of installation, BIC and BAFO measurements of Group 2 were approximately 1.5-fold greater than in Group 1 ($p<0.05$).

Conclusion:

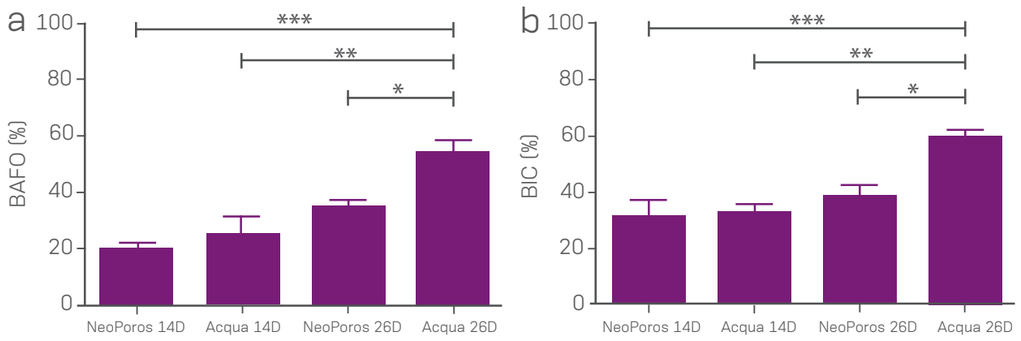
The surface chemistry and wettability implants of Group 2 accelerate osseointegration and increase the area of the bone-to-implant interface when compared to those of Group 1.



Photomicrographs of toluidine blue stained thin sections of the Group 1 at 14 days (a) and 28 days (b) and Group 2 at 14 days (c) and 28 days (b) in bright field (original magnification 10x). Observe the presence of the new bone formation in the area between threads and the contact between bone and both implant groups. In Group 2 at 28 days, see the presence of trabecular bone more compact and in a greater number than Group 1 at the same period, suggesting the acceleration of osseointegration.



Polarized light micrographs of implant sections at the 28 day period. Apical region in Group 1 (a) and Group 2 (b) (original magnification 4X); cervical region in Group 1 (c) and Group 2 (d) (original magnification 20X). The arrows indicate the direction of osteoconduction from pre-existing bone in direction to the implant.



Histomorphometric analysis of (a) Bone area fraction occupied (BAFO) and (b) Mean bone-to-implant contact (BIC). BAFO was calculated as a percentage of the region among the threads. BIC was calculated as a percentage of the total implant perimeter. Results are shown as mean percentages ± standard deviation. Statitically significant differences are indicated by an asterisk, * p<0.05; ** p<0.01; *** p<0.001.

7. Vieira RA, Melo AC, Budel LA, Gama JC, de Mattias Sartori IA, Thomé G. Benefits of rehabilitation with implants in masticatory function: is patient perception of change in accordance with the real improvement? J Oral Implantol. 2014 Jun;40(3):263-9.

Abstract:

This study aimed to compare index of satisfaction and masticatory function of edentulous patients before and after rehabilitation and to evaluate if patient's perception of the changes in their oral health status are in agreement with the results of masticatory performance test. Fourteen edentulous patients were rehabilitated with lower implant-supported fixed prosthesis and upper removable dentures. Index of satisfaction and masticatory capacity (subjective analysis) and performance test (objective analysis) were evaluated before and 20 days and 8 months after rehabilitation. The patients were asked to respond a yes/no masticatory capacity questionnaire and to rate their oral satisfaction on a 0 to 10 Visual Analogue Scale (VAS). Masticatory performance test comprised the ability of the individual to pulverize an artificial test food (Optocal), after 20 and 40 masticatory strokes. When baseline answers were compared to 8 months after treatment answers, all questions, unless the ones that considered pain and social disability, were statistically different. Wilcoxon test was used to compare index of satisfaction before and after treatment. All answers showed statistically significant differences unless the one that referred to easiness to clean the prostheses. Considering the masticatory performance test, Student's t test (normally distributed) and Wilcoxon test (non-normally distributed) were used to test the null hypothesis that the weight of the particles of the test food left in sieves were equal in all times of evaluation. In the larger sieve with 20 cycles statistically significant differences were observed between baseline and 8 months, 20 days and 8 months. With 40 strokes, baseline and 20 days, baseline and 8 months and 20 days and 8 months showed significant differences. **It was concluded that oral rehabilitation leads to better masticatory function in edentulous patients and there is a coincidence between patient perception and real improvement on masticatory function.**

8. Valente ML, de Castro DT, Shimano AC, Lepri CP, Dos Reis AC. Analysis of the influence of implant shape on primary stability using the correlation of multiple methods. Clin Oral Investig. 2015 Nov;19(8):1861-6.

Objective:

The purpose of this study was to analyze the influence of the shape of various implants and the density of substrate on primary stability using a combination of methods.

Material and methods:

Fifty-four Neodent® brand cylindrical and conical implants with different prosthetic platforms were used. Implants were inserted into a pork rib bone and polyurethane blocks. Primary stability was assessed by insertion torque (IT), resonance frequency analysis (RFA), and pullout strength. Screws were also analyzed by scanning electron microscopy (SEM) before insertion and after removal to justify their use for inserting in different substrates.

Results:

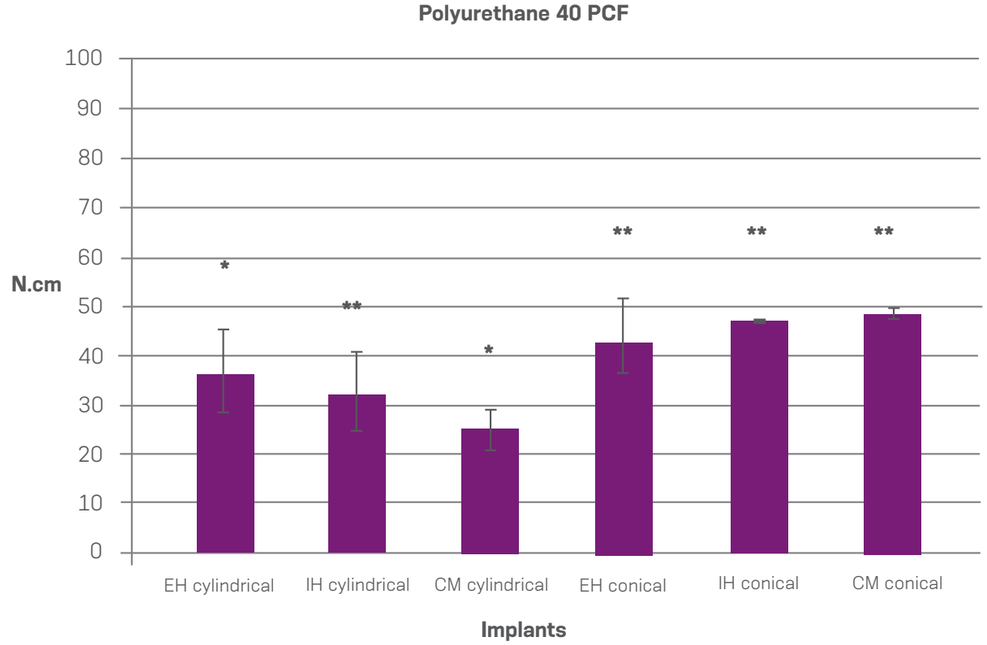
The conical cone morse implant had the highest average for all of the assays performed and was significantly different ($p < 0.05$) from the cylindrical implants for IT in the bone, pullout strength in the 40 per cubic foot (PCF) polyurethane, and the bone. The internal hex cylindrical implant had the lowest averages, which were significantly different ($p < 0.05$) from the conical implants for IT and RFA in the bone, pullout strength in the 40 PCF polyurethane, and the bone. The IT, RFA, and pullout strength assays were moderately correlated, and the photomicrographs did not reveal changes in the implants.

Conclusion:

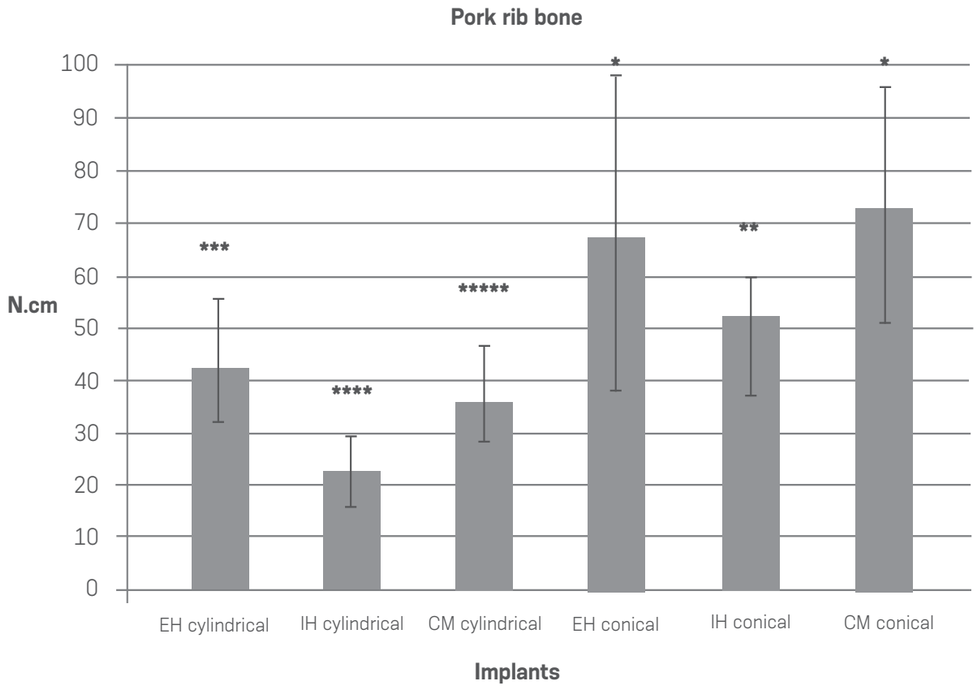
The analysis of different implants showed a better primary stability of tapered implants; the density of the substrate influences the primary stability and the 15 PCF polyurethane was not adequate to evaluate primary stability; correlation was obtained between the different methodologies of analysis of primary stability.

Clinical relevance:

The study shows the influence of different implant macro-geometries and densities of substrates on primary stability.



Mean and standard deviation of insertion torque (N.cm) of the implants inserted in polyurethane 40 PCF:



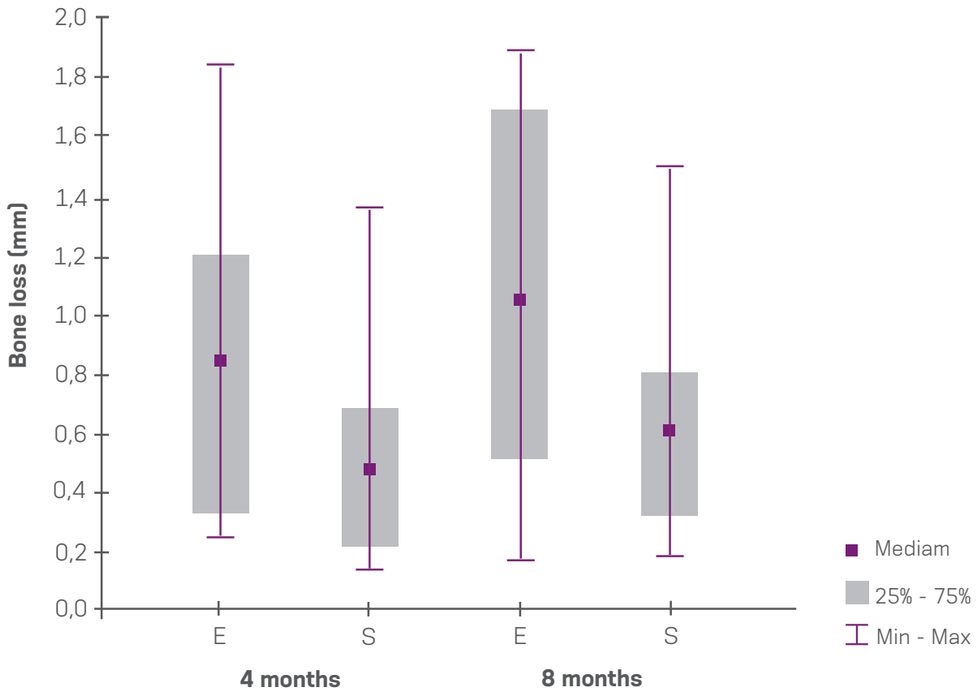
Mean and standard deviation of insertion torque (N.cm) of the implants inserted in pork rib:

9. Siqueira RAC. Avaliação do índice de sucesso e comportamento dos tecidos periimplantares de implantes cone morse equicrestais ou subcrestais em arcos inferiores.[master's dissertation on internet].[Curitiba(Brazil)]: ILAPEO; 2013. [cited 28 out 2015] 126p. Available from: http://www.ilapeo.com.br/Monografias_e_Dissertacoes/Dissertacoes_turma2011/Rafael_Amorin_Cavalcanti_de_Siqueira.pdf

Abstract:

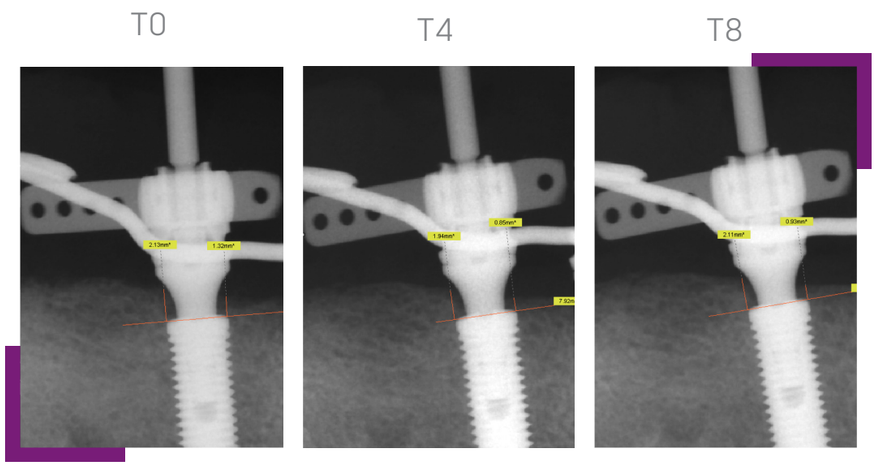
Factors such as the implant-abutment connection, amount of keratinized tissue and the vertical location of the implant shoulder relative to the bone crest can influence the success of the technique, from the standpoint of aesthetic and functional. The present study aimed to evaluate the clinical and radiographic periimplant tissues responses of Morse taper implants inserted in the anterior mandible varying the vertical location of the implant- abutment junction in relation to bone crest subjected to immediate loading and rehabilitated with fixed hybrid prosthesis. Fifty-five Morse taper implants were inserted in the jaws of 11 edentulous patients with general good health from the Latin American Institute for Dental Research (ILAPEO). Twenty seven implants (Neodent CM) were inserted at crestal bone level (Equicrestal group: G1) and the other twenty-eight implants were inserted with its cervical portion 1-3 mm below crestal boné level (Subcrestal group: G2). The groups were done randomly divided to obtain a split-mouth study, five patients had three equicrestal implants and two subcrestal implants, and the remaining 6 patients had two equicrestal implants and three subcrestal implants each. The stability of peri-implant soft tissues was assessed by clinical examination and bone remodeling around implants was accompanied by digital intraoral radiographs and cone beam computadorized tomography (CBCT) scans. The radiographic analyzes showed better results for implants placed subcrestally compared to implants positioned equicrestally at 4 (G1 ≈ 0.86 mm + 0.5; G 2 ≈ 0.50 + 0.3 mm) and 8 months (G1 ≈ 1.2 mm + 0.5, G2 ≈ 0.66 + 0.3 mm) and statistically significant difference was observed.

The subcrestal implants showed lower rates of crestal bone resorption compared to implants placed subcrestally. The width and thickness of keratinized tissue does not seem to significantly influence the behavior of periimplant soft tissues of Morse taper implants subjected to immediate loading in edentulous arches this standard split-mouth study.

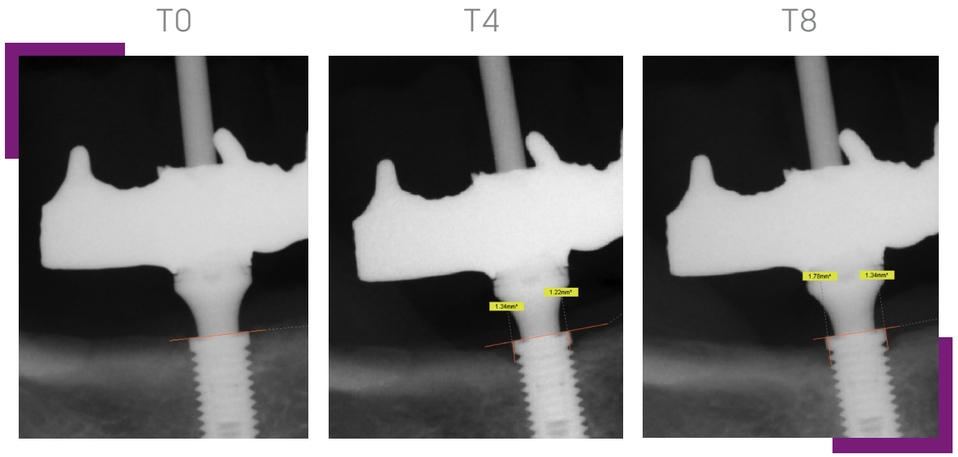


Values of bone remodelation (mesial/distal) in different periods of time in relation to the implant positioning (Equicretal and Subcrestal), there were significant differeces (Wilcoxon) between E and S, regardless of time (T4, p=0.003 and T8, p=0,-13).

Subcrestal



Equicrestal



Exemples of implants equi and sub crestal positioned at day zero, 4 months and 8 months.

10. Sumiyassu, S et al. Tissue response around morse taper and external hexagon implants: preliminary results of a randomeized split- mouth design. SALUSVITA. 2013; 32(1):09-24.

Introduction:

The aim of this study was to histomorphometrically evaluate the influence of interimplant distances (ID) and implant placement depth on bone remodeling around contiguous Morse cone connection implants with 'platform-shifting' in a dog model.

Objective:

the aim of this study was to compare tissue response around immediately loaded mandibular dental implants with two different prosthetic connections.

Methods:

a total of 48 implants were inserted in the anterior region of the mandible of 12 edentulous patients following a randomized split-mouth design. Morse Taper and External Hexagon implants (Neodent) were equally divided into each patient. Distal implants were tilted and central implants axially positioned in relation to the alveolar crest. Standardized intraoral radiographs were taken immediately after implant placement and after 6 months. Periodontal parameters (probing depth and keratinized tissue width and height) were recorded at the same times. Wilcoxon test was used. Results and Discussion: It was observed stability of the gingival margin and decrease in probing depth around Morse taper implants and increase in external hexagon implants. There was marginal bone increase in the mesial face (0.27 mm) and decrease at the distal face (-0.87 mm) of Morse taper and at both proximal faces of external hexagon implants (-1.06 mm and -0.80 mm, respectively). Morse taper tilted implants showed maintenance of bone height (0.03 mm and -0.02mm, mesial and distal) while external hexagon implants showed resorption (-1.82 mm and -0.75 mm, mesial and distal).

Axially positioned implants showed bone loss, either Morse taper (-0.72 and -0.67mm, mesial and distal) or external hexagon (-0.69 and -0.83 mm). There was no correlation between availability of keratinized tissue and bone behaviour.

Conclusion:

these findings suggest that Morse taper implants showed better results than external hexagon ones, nevertheless it should be emphasized that these are preliminary results and longer evaluations are suggested.

Mesial Face

Design	Bone level	Mean (mm)	Median (mm)	SD (mm)	P value
Tilted Morse Taper	T0 (baseline)	0.33	0.39	0.928	0.959
	T1 (6 months)	0.36	0.76	0.868	
	Difference	0.03	000	0.486	
Axial Morse Taper	T0 (baseline)	1.49	1.86	1.20	0.026*
	T1 (6 months)	0.77	1.56	1.47	
	Difference	-0.72	-0.74	0.86	
Tilted External Hexagon	T0 (baseline)	0.72	-).36	1.42	0.005*
	T1 (6 months)	-1.10	-1.05	1.16	
	Difference	-1.82	-0.23	1.52	
Axial External Hexagon	T0 (baseline)	0.43	0.20	1.00	0.007*
	T1 (6 months)	-0.26	-0.39	1.32	
	Difference	-0.69	-0.50	0.50	

Face

Design	Bone level	Mean (mm)	Median (mm)	SD (mm)	P value
Tilted Morse Taper	T0 (baseline)	1.51	1.86	1.317	0.959
	T1 (6 months)	1.49	1.20	1.004	
	Difference	-0.02	-0.11	1.372	
Axial Morse Taper	T0 (baseline)	1.51	1.35	0.98	0.041*
	T1 (6 months)	0.84	0.63	1.29	
	Difference	-0.67	-0.60	0.93	
Tilted External Hexagon	T0 (baseline)	-0.22	0.58	0.75	0.285*
	T1 (6 months)	-0.97	-0.84	1.76	
	Difference	-0.75	-1.12	1.95	
Axial External Hexagon	T0 (baseline)	0.41	0.55	1.25	0.007*
	T1 (6 months)	-0.43	-0.67	1.42	
	Difference	-0.83	-0.57	0.75	

Peri-implant bone response after 6 months at the mesial and distal faces.

11. Castro DS, Araujo MA, Benfatti CA, Araujo C dos R, Piattelli A, Perrotti V, Iezzi G. Comparative histological and histomorphometrical evaluation of marginal bone resorption around external hexagon and Morse cone implants: an experimental study in dogs. Implant Dent. 2014 Jun;23(3):270-6

Purpose:

Aim of this study was to evaluate the histological and histomorphometrical differences at the marginal bone level with the use of 2 different implant-abutment assembly designs (the traditional External Hexagon and the Morse Cone tapered connections).

Methods:

Nine Morse Cone and 9 External Hexagon implants (Neodent) were inserted in 6 mongrel dogs. The Morse Cone implants were installed 2 mm below the crestal bone level, whereas the External Hexagon flush. The implants were retrieved after 2 months. Mean distance between the original level of coronal bone to the top of the implant and the mean distance between the top of the implant and the first bone-to-implant contact (fBIC) were recorded.

Results:

No significant differences were found when the mean distance between the original level of coronal bone to the top of the implant was evaluated; however, there were statistically significant differences in the mean distances between the top of the implants and fBIC, suggesting a smaller amount of bone loss or remodeling in the Morse Cone compared to the External Hexagon group.

Conclusion:

Subcrestal placement had a positive impact on crestal bone remodeling in Morse Cone implants.

Mean ± SD Values of Bone Loss From Bone Crest to Implant Platform			
External Hexagon Buccal Side (Mean + SD)	External Hexagon Lingual Side (Mean + SD)	Morse Cone Buccal Side (Mean + SD)	Morse Cone Lingual Sede (Mean + SD)
1.23 ± 0.49	0.79 ± 0.32	0.03 ± 0.08	0 ± 0

Dunn`s multiplie comparison test.
No statiticaly significant differences.

Mean ± SD Values of Crestal Bone Loss From Implant Platform to fist Bone to Implant Contact			
External Hexagon Buccal Side (Mean + SD)	External Hexagon Lingual Side (Mean + SD)	Morse Cone Buccal Side (Mean + SD)	Morse Cone Lingual Sede (Mean + SD)
1.69 ± 0.44	1.40 ± 0.63	0.03 ± 0.08	0 ± 0

Dunn`s multiple comparison test.	
External Hexagon buccal side versus External Hexagon lingual side	ns P > 0.05.
External Hexagon buccal side versus Morse Cone buccal side	**P < 0.01.
External Hexagon buccal side versus Morse Cone lingual side	***P < 0.001.
External Hexagon lingual side versus Morse Cone buccal side	*P < 0.05.
External Hexagon lingual side versus Morse Cone lingual side	**P < 0.01.
Morse Cone buccal side versus Morse Cone lingual side	ns P > 0.05.
External Hexagon buccal side versus Morse Cone buccal side	**P < 0.01

12. Martin C, Thomé G, Melo AC, Fontão FN. Peri-implant bone response following immediate implants placed in the esthetic zone and with immediate provisionalization-a case series study. Oral Maxillofac Surg. 2015 Jun;19(2):157-63.

Purpose:

The aim of this case series was to evaluate success and peri-implant bone response around Morse taper immediate implants with an immediate provisionalization.

Methods:

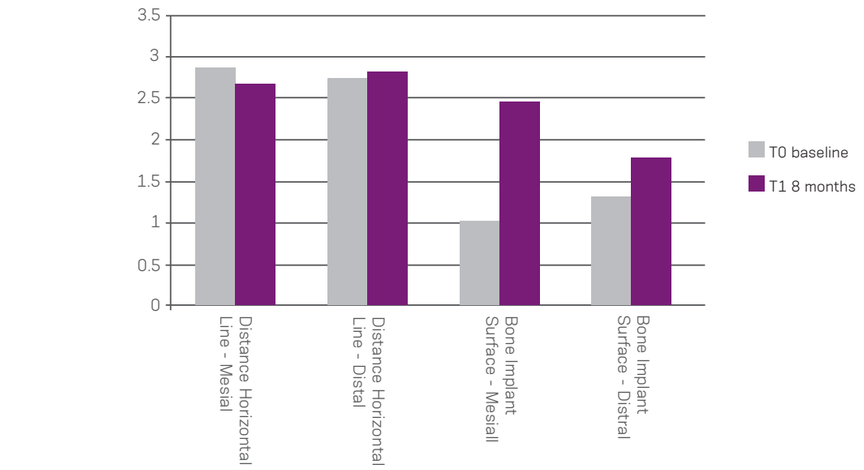
Twelve immediate implants (Neodent CM) were inserted in the maxilla of nine consecutively treated patients. Proximal bone response was evaluated with digital periapical radiographs, and the buccal wall height and width were evaluated with computed tomography

Results:

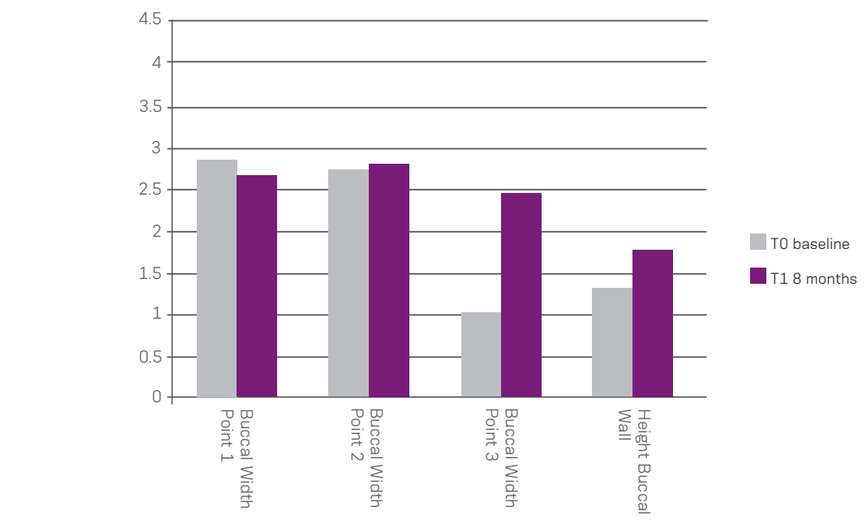
A slight decrease in the marginal bone crest (0.14 ± 0.41 mm) at the mesial face and an increase (0.07 ± 1.58 mm) at the distal face were observed. Considering the point where bone tissue meets the implant surface, there was a statistically significant increase at the mesial face (0.92 ± 1.29 mm) and a not significant increase at the distal face (0.43 ± 1.63 mm). Buccal bone wall width showed a statistically significant bone loss at the level of the implant/abutment junction (0.77 ± 0.75 mm) and at 3 mm (0.59 ± 0.76 mm) and 6 mm (0.46 ± 0.81 mm) apically to the implant/abutment junction. The height of the buccal wall showed a not statistically significant resorption (0.20 ± 0.51 mm).

Conclusion:

Based on the preliminary results (8 months) of this case series study, it can be concluded that there was bone loss on the mesial bone crest level and on the buccal face and bone increases on the mesial and distal faces in the area where the bone meets the implant surface. Nevertheless, this is just a case series study, and long-term controlled clinical trials are essential for a definitive conclusion.



Column graph showing proximal level data at T0 and T1.



Column graph showing buccal bone width and height at T0 and T1.

13. Novaes AB Jr, Barros RR, Muglia VA, Borges GJ. Influence of interimplant distances and placement depth on papilla formation and crestal resorption: a clinical and radiographic study in dogs. J Oral Implantol. 2009;35(1):18-27

Abstract:

Among the factors that contribute to the papilla formation and crestal bone preservation between contiguous implants, this animal study clinically and radiographically evaluated the interimplant distances (IDs) of 2 and 3 mm and the placement depths of Morse cone connection implants (Neodent CM) restored with platform switch. Bilateral mandibular premolars of 6 dogs were extracted, and after 12 weeks, the implants were placed. Four experimental groups were constituted: subcrestally with ID of 2 mm (2 SCL) and 3 mm (3 SCL) and crestally with ID of 2 mm (2 CL) and 3 mm (3 CL). Metallic crowns were immediately installed with a distance of 3 mm between the contact point and the bone crest. Eight weeks later, clinical measurements were performed to evaluate papilla formation, and radiographic images were taken to analyze the crestal bone remodeling. The subcrestal groups achieved better levels of papillae formation when compared with the crestal groups, with a significant difference between the 3 SCL and 3 CL groups (P = .026). Radiographically, the crestal bone preservation was also better in the subcrestal groups, with statistically significant differences between the 2SCL and 2CL groups (P = .002) and between the 3SCL and 3CL groups (P = .008). With the present conditions, **it could be concluded that subcrestal implant placement had a positive impact on papilla formation and crestal bone preservation, which could favor the esthetic of anterior regions. However, the IDs of 2 and 3 mm did not show significantly different results.**

Clinical analysis: distance from the contact point to the tip of the papilla (CP-P)

	Crestally		Subcrestally	
Dog	2mm	3mm	2mm	3mm
1	3.04	3.28	0.85	1.85
2	1.24	4.35	1.32	0.41
3	0.91	1.67	0.63	1.13
4	1.38	1.40	0.64	0.86
5	1.37	1.36	0.80	0.97
6	0.57	1.39	0.90	0.85
Mean ± SD	1.42 ± 0.85	2.24 ± 1.27*	0.86± 0.25	1.01 ± 0.48*

* Significance level pf p< .05.

Radiographic analysis: distance fron the contact point to the bone crest (CP-BC)

	Crestally		Subcrestally	
Dog	2mm	3mm	2mm	3mm
1	3.04	3.28	0.85	1.85
2	1.24	4.35	1.32	0.41
3	0.91	1.67	0.63	1.13
4	1.38	1.40	0.64	0.86
5	1.37	1.36	0.80	0.97
6	0.57	1.39	0.90	0.85
Mean ± SD	3.36 ± 0,27*˙***	3.63 ± 0,50*˙**	2.94 ± 0,21***	2.99 ± 0,29**

*˙**˙*** Significance level pf p< .05 between groups.

14. Barros RRM, Novaes AB Jr, Muglia VA, Iezzi G, Piattelli A. Influence of interimplant distances and placement depth on peri-implant bone remodeling of adjacent and immediately loaded Morse cone connection implants: a histomorphometric study in dogs. Clin Oral Implants Res. 2010 Apr 1;21(4):371-8.

Abstract:

The aim of this study was to histomorphometrically evaluate the influence of interimplant distances (ID) and implant placement depth on bone remodeling around contiguous Morse cone connection implants with 'platform-shifting' in a dog model.

Material and methods:

Bilateral mandibular premolars of six dogs were extracted, and after 12 weeks, each dog received 8 implants (Neodent CM), four placed 1.5 mm subcrestally (SCL) on one side of the mandible and four placed equicrestally (ECL) on the other side, alternating the ID of 2 and 3 mm. The experimental groups were SCL with IDs of 2 mm (2 SCL) and 3 mm (3 SCL) and ECL with IDs of 2 mm (2 ECL) and 3 mm (3 ECL). Metallic crowns were immediately installed. After 8 weeks, the animals were euthanized and histomorphometric analyses were performed to compare bone remodeling in the groups

Results:

The SCL groups indices of crestal bone resorption were significantly lower than those of ECL groups. In addition, the vertical bone resorption around the implants was also numerically inferior in the SCL groups, but without statistical significance. No differences were obtained between the different IDs. All the groups presented similar good levels of bone-to-implant contact and histological bone density.

Conclusion:

The subcrestal placement of contiguous Morse cone connection implants with 'platform shifting' was more efficient in preserving the interimplant crestal bone. The IDs of 2 and 3 mm did not affect the bone remodeling significantly under the present conditions

Crestal bone resorption between the implants and vertical bone resorption around implants at the interimplants areas and at the free ends of the bridges for the four experimental groups (mean + standard deviation in mm)

Crestal bone resorption		Vertical bone resorption around implants	
		Interimplant area	Free ends area
2 ECL	0.58 ± 0.63	0.92 ± 0.61	0.91 ± 0.60
3 ECL	0.46 ± 0.36*	0.68 ± 0.57	0.92 ± 056
2 SCL	(-) 0.14 ± 0.77**	0.49 ± 0.38#	0.79 ± 031#
3 SCL	(-) 0.47 ± 0.61	0.37 ± 0.29¥	0.79 ± 046

Crestal bone resorption
Wilcoxon matched-pairs signed-ranks test

Comparisons	P value	Significance
2 ECL X 3 ECL	0.8438	P>0.05
2 ECL X 2 SCL	0.0313	P<0.05*
2 ECL X 3 SCL	0.0313	P<0.05*
3 ECL X 2 SCL	0.0938	P>0.05
3 ECL X 3 SCL	0.0313	P<0.05*
2 SCL X 3 SCL	0.4375	P>0.05

Fresdman`test (non-parametric repeated measures analysis of variance)

Parameter	P value	Significance
Cresta bone resorption	0.0015	P<0.05
Bone level - interimplant area	0.3715	P>0.05
Bone level - free ends area	0.8740	P>0.05

Wilcoxon`matched-pairs signes-ranks test

Comparisons	P value	Significance
E ECL interimplant x free ends areas	0.8438	P>0.05
3 ECL interimplant x free ends areas	0.0938	P>0.05
2 SCL interimplant x free ends areas	0.0313	P<0.05#
3 SCL interimplant x free ends areas	0.0313	P<0.05

Symbols used evidence the comparisons between the lines that achieved statistical significance.

C. CM connection designed to prevent bacteria migration into the implant

Implant News

15. dos Anjos CM, Harari ND, Reis RSA, Vidigal Junior GM. Análise in vitro da infiltração bacteriana na interface de pilares protéticos e implantes cone-morse / In vitro analysis of bacterial leakage at the interface between Morse taper implant platform and prosthetic abutments. ImplantNews;8(2):239-243, 2011.

Abstract:

The presence of microgap between dental implant and prosthetic abutment may be responsible for the accumulation of peri-implant biofilm, composed of several bacterial strains. When described as etiological factor of inflammatory processes they trigger tissue disruption and can interfere with the long-term periimplant health. The aim of this study was to assess whether the microgap between Morse Taper platform implants and prosthetic abutment allow the occurrence of infiltration of a specific bacterial strain. It was used 30 sets implants/prosthetic abutment of two implant systems with Morse Taper interface marketed in Brazil. The sample was divided into 3 groups with 10 samples each: Neodent implants and prosthetic abutments, Ankylos implants with respective prosthetic abutments, and Ankylos implants with Neodent prosthetic abutments. The implant inner chamber was inoculated with 0.1 µl of Escherichia coli suspension, before the abutment recommended tightening by each manufacturer. Samples were then immersed in a culture medium for analysis of MacConkey muddiness for analysis of cloudiness, indicating infiltration at the microgap. Measurements after inoculation were performed at 1, 2, 5, 7, and 14 days. The results showed that none of the samples presented cloudiness in the culture medium, with the viability of the bacteria demonstrated by positive control tests. **It was concluded that the Morse Taper interfaces systems studied prevented the migration of E. coli between the prosthetic abutment and implants used.**

Microbiological analisis of the inoculated implants

Implants abutment Time/days	Neodent/ Neodent 1-10	Swab 1-10
1	-	-
2	-	-
5	-	-
10	-	-
14	-	-

16. do Nascimento C, Miani PK, Pedrazzi V, Gonçalves RB, Ribeiro RF, Faria AC, Macedo AP, de Albuquerque RF Jr. Leakage of saliva through the implant-abutment interface: in vitro evaluation of three different implant connections under unloaded and loaded conditions. Int J Oral Maxillofac Implants. 2012 May-Jun;27(3):551-60.

Purpose:

Bacterial leakage along the implant-abutment interface, with consequent species harboring the inner parts of two-part dental implant systems, has been reported in the literature. The aim of this in vitro study was to evaluate bacterial leakage from human saliva to the internal part of the implants along the implant-abutment interface under loaded and unloaded conditions using DNA Checkerboard.

Materials and methods:

Sixty dental implants-20 each of external-hexagon, internal-hexagon, and Morse cone-connection designs-and their conical abutments were used in this study (Neodent). Each group was subdivided into two groups of 10 loaded and 10 unloaded implants. The assemblies were immersed in human saliva and either (1) loaded with 500,000 cycles at 120 N (experimental group) or (2) incubated in static conditions for 7 days at 35°C (unloaded control group).

Results:

Microorganisms were found in the internal surfaces of all types of connections. The Morse cone connection presented the lowest count of microorganisms in both the unloaded and loaded groups. Loaded implants presented with higher counts of microorganisms than unloaded implants for external- and internal-hex connections.

Conclusion:

Bacterial species from human saliva may penetrate along the implant-abutment interface under both unloaded and loaded conditions for all connections evaluated. Morse cone-connection implants showed the lowest counts of microorganisms for both conditions. External- and internal-hex implants showed a higher incidence of bacteria and higher bacterial counts after simulated loading.

17. Resende CC, Castro CG, Pereira LM, Prudente MS, Zancopé K, Davi LR, Penatti MP, das Neves FD. Influence of the Prosthetic Index Into Morse Taper Implants on Bacterial Microleakage. Implant Dent. 2015 Oct;24(5):547-51

Purpose:

To evaluate the influence of Morse taper implant index on microleakage.

Materials and methods:

Thirty implants and abutments (Neodent CM) were divided into 3 groups (n = 10): CM1 (universal post and implant without index), CM2 (universal post and implant with index), and CM3 (abutment and implant with index). To evaluate the microleakage from the implant inner part, the implants were inoculated with Streptococcus sanguinis solution at a 0.5 McFarland and incubated for 7 days at 37ºC in Eppendorf tubes with sterile broth. To evaluate the microleakage into the inner part of implant, these were inoculated with sterile Schaedler broth and immersed in a Fusobacterium nucleatum solution at a 0.5 McFarland. The samples were incubated for 30 days in an anaerobic chamber.

Results:

Nine samples of each group of the first methodology showed no presented bacterial contamination. No samples of the second methodology demonstrated turbidity of the broth.

Conclusion:

The presence of the prosthetic internal index had no influence on bacterial microleakage of Morse taper implants under static conditions, for both methodologies.

Positive and Negative Results of Conrol Test and Microleakage From the Inner Part of Implant

	CM1		CM2		CM3	
	Control Test	Microleakage	Control Test	Microleakage	Control Test	Microleakage
1	-	-	-	-	-	-
2	-	-	-	-	-	+
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	+	-	-	-	-
10	-	-	-	+	-	-
Total	0	1	0	1	0	1

D. Mechanical stability of the CM connection

The International Journal of Oral & Maxillofacial Implants

18. Bernardes SR, da Gloria Chiarello de Mattos M, Hobkirk J, Ribeiro RF. Loss of preload in screwed implant joints as a function of time and tightening/untightening sequences. Int J Oral Maxillofac Implants. 2014 Jan-Feb;29(1):89-96.

Purpose:

The purpose of this study was to determine whether abutment screw tightening and untightening influenced loss of preload in three different implant/abutment interfaces, or on the implant body

Materials and methods:

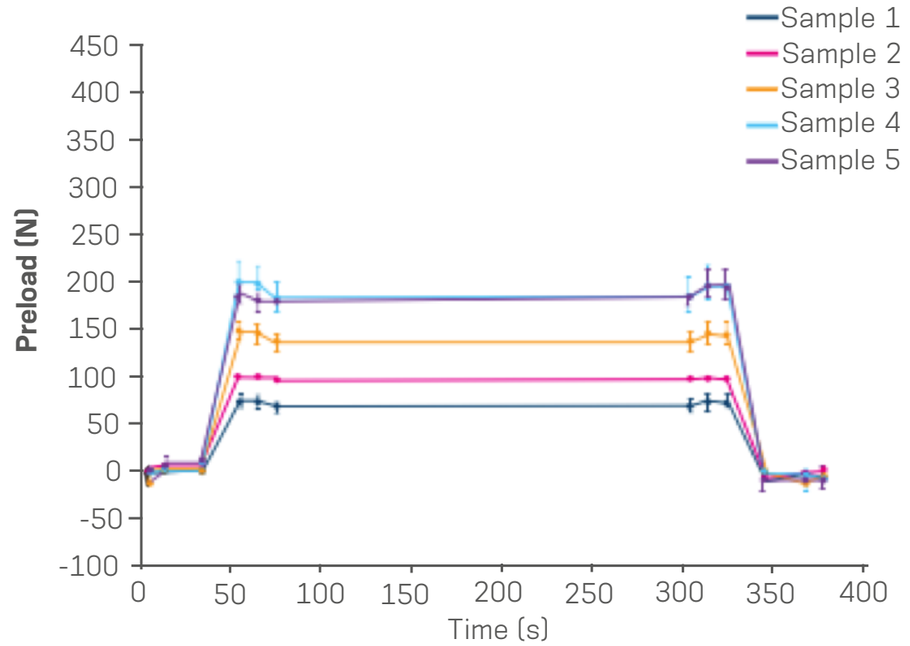
Five custom-fabricated machined titanium implants were used, each with its respective abutment, with different connection types, retention screws, and torque values (external hexagon with titanium screw/32 Ncm, external hexagon with coated screw/32 Ncm, internal hexagon/20 Ncm and internal conical/20 and 32 Ncm). Each implant tested had two strain gauges attached and was submitted to five tightening/untightening sequences.

Results:

External hexagons resulted in the lowest preload values generated in the implant cervical third (mean of 27.75 N), while the internal hexagon had the highest values (mean of 219.61 N).

Conclusions:

There was no immediate significant loss of preload after screw tightening. Tightening/untightening sequences, regardless of the implant/abutment interface design or type of screw used in the study, did not result in any significant loss of initial preload. Conical implant connections demonstrated greater structural reinforcement within the internal connections.



Mean preload values (N) as a function of time (seconds) and 95% CIs for the five tightening/untighetening sequences for the Morse Tape One Piece 32 group.

19. González RC, Shimizu RH, Hermann C, Sartori IAM. Efeito de diferentes níveis de torques na resistência ao destorque do parafuso e dos pilares de duas peças em junções cone-morse. Estudo in vitro / The effect of different torque levels on detorque resistance of a two-piece, cone Morse abutment and screw. An in vitro study ImplantNews; 11(4): 444-450, 2014.

Objectives:

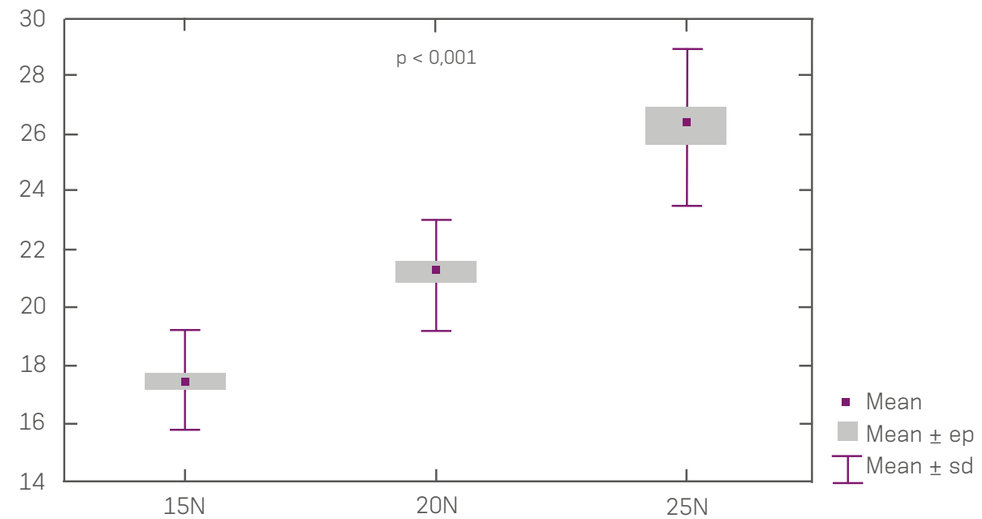
To determine whether the applied preload influences on detorque resistance of abutment and abutment screw of a two-piece, indexed cone-morse taper connection.

Materials and methods:

Sixty implant analogs (cone-morse taper=11,5 degrees, Neodent) with internal hexagonal indexing and sixty cone morse universal abutments (4.5 mm diameter, 2.5 mm collar height, and 4 mm in height, non-indexed), were divided into three groups according to applied torques: 15 Ncm (G1); 20 Ncm (G2), and 25 Ncm (G3). The one-way Anova and LSD tests were used for comparisons among groups (at 5% level). Representative SEM images were obtained from screw heads and key drivers.

Results:

Mean detorque abutment screw values were as follows: G1=17.48 Ncm, G2=21.16 Ncm, and G3=26.42 Ncm, with statistically significant differences ($p < 0,001$) among all tested groups. Also, the mean detorque abutment levels were: G1=15.17 Ncm, G2=19.58 Ncm, and G3=21.64 Ncm, being (G1 and G2); (G1 and G3) ($p < 0.001$); and G2 and G3 ($p=0.02$). **Conclusion: 1) an increase on abutment screw torque level also increases detorque values for all groups; 2) an increase on abutment torque level provided detorque values proportional to that found in G1 and G2, being this lower for G3; 3) torque values higher than those preconized by the manufacturer lead to plastic deformation at screw heads after repeated tightening sequences.**

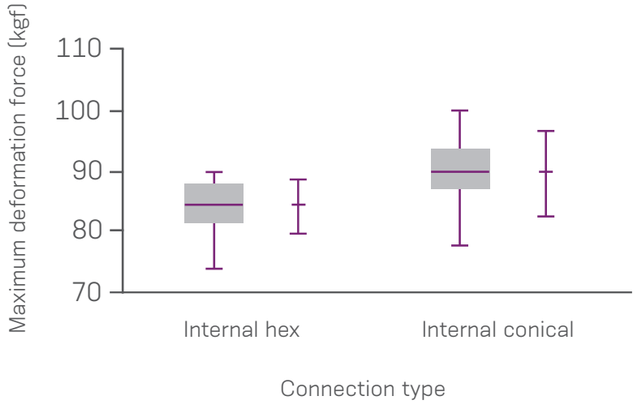


Mean detorque abutment screw values among all tested groups.

20. Coppedê AR, Bersani E, de Mattos Mda G, Rodrigues RC, Sartori IA, Ribeiro RF. Fracture resistance of the implant-abutment connection in implants with internal hex and internal conical connections under oblique compressive loading: an in vitro study. Int J Prosthodont. 2009 May-Jun;22(3):283-6.

Abstract:

The objective of this study was to verify if differences in the design of internal hex (IH) and internal conical (IC) connection implant systems (Neodent) influence fracture resistance under oblique compressive forces. Twenty implant-abutment assemblies were utilized: 10 with IH connections and 10 with IC connections. Maximum deformation force for IC implants (90.58 +/- 6.72 kgf) was statistically higher than that for IH implants (83.73 +/- 4.94 kgf) (P = .0182). Fracture force for the IH implants was 79.86 +/- 4.77 kgf. None of the IC implants fractured. **The friction-locking mechanics and the solid design of the IC abutments provided greater resistance to deformation and fracture under oblique compressive loading when compared to the IH abutments.**



Maximum deformation force values for the internal hex and the internal conical systems,

21. Castro CG, Zancopé K, Veríssimo C, Soares CJ, Neves FD. Strain analysis of different diameter Morse taper implants under overloading compressive conditions. Braz Oral Res. 2015;29(1):16.

Abstract:

The aim of this study was to evaluate the amount of deformation from compression caused by different diameters of Morse taper implants and the residual deformation after load removal. Thirty Morse taper implants lacking external threads were divided into 3 groups (n = 10) according to their diameter as follows: 3.5 mm, 4.0 mm and 5.0 mm. Two-piece abutments were fixed into the implants, and the samples were subjected to compressive axial loading up to 1500 N of force. During the test, one strain gauge remained fixed to the cervical portion of each implant to measure the strain variation. The strain values were recorded at two different time points: at the maximum load (1500 N) and 60 seconds after load removal. To calculate the strain at the implant/abutment interface, a mathematical formula was applied. Data were analyzed using a one-way Anova and Tukey's test (∂ = 0.05). The 5.0 mm diameter implant showed a significantly lower strain (650.5 μS ± 170.0) than the 4.0 mm group (1170.2 μS ± 374.7) and the 3.5 mm group (1388.1 μS ± 326.6) ($p < 0.001$), regardless of the load presence. The strain values decreased by approximately 50% after removal of the load, regardless of the implant diameter. The 5.0 mm implant showed a significantly lower strain at the implant/abutment interface (943.4 μS ± 504.5) than the 4.0 mm group (1057.4 μS ± 681.3) and the 3.5 mm group (1159.6 μS ± 425.9) ($p < 0.001$). **According to the results of this study, the diameter influenced the strain around the internal and external walls of the cervical region of Morse taper implants; all diameters demonstrated clinically acceptable values of strain.**

Strain criteria	Ø Implant		
	5.0 mm	4.0 mm	3.50 mm
Strain at maximum load (1500N)	650.5 ± 170.0^{A}	1170.2 ± 374.7^{B}	1388.1 ± 326.6^{B}
Residual Strain (after removing the load)	377.5 ± 106.9^{A}	594.3 ± 173.6^{B}	784.4.± 128.8^{C}

Means followed by different letters indicate statistically significant differences at 5% compared to the similar values from different diameter implants.

The International Journal of Oral & Maxillofacial Surgery

22. Sartori EM, Padovan LE, de Mattias Sartori IA, Ribeiro PD Jr, Gomes de Souza Carvalho AC, Goiato MC. Evaluation of satisfaction of patients rehabilitated with zygomatic fixtures. J Oral Maxillofac Surg. 2012 Feb;70(2):314-9.

Purpose:

The aim of this study was to evaluate the satisfaction of patients rehabilitated with zygomatic fixtures and prosthesis with immediate loading.

Materials and methods:

The study selected patients who were rehabilitated with zygomatic implants (Neodent) at the clinic of the Latin American Institute for Dental Research and Education (ILAPEO. Curitiba-PR. Brasil) between 2005 and 2009. The patients were asked to answer a control-questionnaire during their follow-up visits. Data were collected regarding the level of patient satisfaction, reason for dissatisfaction, number of post-operative clinical sessions, and the type of complication. Sixteen patients were selected: 10 females and 6 males.

Results:

Half of the patients were completely satisfied while the other half were satisfied with some complaints. The complaints were related to hygiene, esthetics, phonetics, and discomfort during chewing. Regarding the post-operative evaluation, 50% of the patients were attended due to the prosthesis (62.5%) and the implant (37.5%).

Conclusions:

The treatment with zygomatic fixtures is predictable and reliable. The patients were satisfied both with implants and prosthesis.

The Journal of Craniofacial Surgery

23. Suzuki D, Bassi AP, Lee HJ, Alcântara PR, de Sartori IM, Luvizuto ER, Faco EF, Faot F. Inferior alveolar nerve lateralization and implant placement in atrophic posterior mandible. J Craniofac Surg. 2012 Jul;23(4):e347-9.

Abstract:

The aims of this article were to describe the surgical technique of the inferior alveolar nerve lateralization followed by implant (Neodent) installation by means of a clinical report and also to discuss the importance of an adequate surgical and prosthetic planning for atrophic posterior mandible rehabilitation.

24. Faot F, Hermann C, Sartori EM, Bassi AP. Tilted implants and prototyping: a security option for improving the anchorage in atrophic maxilla. Gen Dent. 2013 Mar-Apr;61(2):28-31.

Abstract:

Rehabilitating atrophic maxilla poses many challenges. Reconstructive techniques that require sinus grafting are viable and acceptable; however, these techniques also are considered to be expensive, invasive, and time-consuming. Tilted implants anchored in distal areas using available bone have been reported as a less invasive and highly predictable treatment option. This article presents a case involving implant (Neodent) anchorage via tilted implants as an alternative technique to bone grafting procedures.

25. Aparecida de Mattias Sartori I, Uhlendorf Y, Padovan LE, Junior PD, Melo AC, Tiossi R. Attachment-retained gingival prosthesis for implant-supported fixed dental prosthesis in the maxilla: a clinical report. J Prosthodont. 2014 Dec;23(8):654-8.

Abstract:

The rehabilitation of edentulous maxillae is a complex procedure due to the involvement of esthetic and functional requirements. A trial maxillary denture can be used to identify the need for adequate upper lip support when replacing removable complete dentures by implant-fixed dental prostheses. This clinical report describes the outcome of the rehabilitation of an edentulous atrophic maxilla with unfavorable maxillomandibular relationship and deficient upper lip support. A trial denture was fabricated and used to diagnose the need for a prosthesis capable of restoring the upper lip support. The reduced upper lip support was also confirmed by a lateral cephalogram. The patient was rehabilitated by an implant-fixed dental prosthesis associated with an attachment-retained gingival prosthesis. **The case presented shows that when loss of upper lip support is detected and the patient does not wish to undergo further surgical reconstruction procedure, the retention of a gingival prosthesis using a ball attachment is a satisfactory treatment option.**

26. Luiz J, Padovan LE, Claudino M. Recombinant human bone morphogenetic protein 2 in augmentation procedures: case reports. Int J Oral Maxillofac Implants. 2014 Sep-Oct;29(5):1198-203.

Abstract:

To successfully rehabilitate edentulous patients using endosseous implants, there must be enough available bone. Several techniques have been proposed for augmentation of sites with insufficient bone volume. Although autogenous bone has long been considered the gold standard for such procedures, the limited availability of graft material and a high morbidity rate are potential disadvantages of this type of graft. An alternative is to use recombinant human bone morphogenetic protein 2 (rhBMP-2), which is able to support bone regeneration in the oral environment. **These case demonstrate the applicability of rhBMP-2 in maxillary sinus elevation and augmentation procedures in the maxilla to enable dental implant placement. The use of rhBMP-2 in alveolar augmentation procedures had several clinical benefits for these patients.**

27. Jamcoski VH, Faot F, de Mattias Sartori IA, Vieira RA, Tiossi R. Occlusal concepts application in resolving implant prosthetic failure: case report. J Oral Implantol. 2014 Apr;40(2):203-10.

Abstract:

The prosthetic management of a poor implant treatment is presented in this case report. The recommended occlusion concepts for implant-supported prostheses were applied for the resolution of the case. The rehabilitation of the posterior segments provided a mutually protected occlusion with adequate distribution of the axial and lateral bite forces with stable posterior occlusion. The clinical exam indicated the need for modification in the vertical dimension of occlusion. Sufficient interocclusal rest space was present to test the alteration in the vertical dimension. The aim was to achieve an occlusion scheme that followed four specific criteria: (1) centric contacts and centric relation of the jaw-to-jaw position; (2) anterior guidance only; (3) shallow anterior angle of tooth contact; and (4) vertical dimension of occlusion with acceptable tooth form and guidance. **The success of an oral rehabilitation relies in following the aforementioned criteria, appropriate interaction between the dental laboratory technician and the clinician, careful elaboration of the provisional rehabilitation with all the desired details to be reproduced in the final prosthetic restoration and sufficient follow-up time of the provisional prostheses before placing the final restoration.**

28. Padovan LE, Ribeiro-Júnior PD, de Mattias Sartori IA, Thomé G, Sartori EM, Uhlendorf J. Multiple zygomatic implants as an alternative for rehabilitation of the extremely atrophic maxilla: a case letter with 55 months of follow-up. J Oral Implantol. 2015 Feb;41(1):97-100.

Introduction:

Zygomatic implants have been considered an alternative treatment for prosthetic rehabilitation of patients with an atrophied maxilla without bone augmentation. These fixtures were introduced by Branemark in 1988, ranging in length from 30 mm to 52.5 mm and designed to be anchored in zygomatic bone.4 These implants have also been widely used for rehabilitation of maxillary defects as a result of tumor resections, congenital defects, trauma, and cases of severe atrophy of the maxilla. Indeed, the applicability of zygomatic implants represents a simplification of the conventional treatment of atrophic maxillae, which is based in bone augmentation procedures associated with dental implant placement. Therefore, these implants involve a less invasive surgical technique, reduction of costs, and treatment duration, compared to conventional rehabilitation of atrophic maxillae.

Case report:

A 78-year-old male patient was referred to the Latin American Institute of Dental Research and Education complaining of an unstable maxillary complete denture (Figure 1). The medical record includes a history of chronic sinusites. However, the patient also related the absence of symptoms for a long time and no evidence of opacification of the maxillary sinus were detected in computerized tomography evaluation (Figure 2). Clinical, radiographical and tomographical examinations revealed absence of all teeth in the maxilla and the presence of an osseointegrated nonfunctional implant in the region corresponding to tooth #1. This implant was not removed in order to avoid communications or bone resorption in this region. Moreover, it was detected that there was extensive bone resorption with bilateral pneumatization of the maxillary sinuses aggravated by the previous use of a subperiosteal implant (Figure 2). In the mandible, the following teeth were missing: #18, #19, #20, #21, #22, #23, #24 ,#25, #26, and #30. Teeth #31, #29, #28, and #27 had severe periodontal disease with mobility. There was also the presence of 3 osseointegrated implants in regions corresponding to teeth #26, #22, and #20, which supported a metal-ceramic fixed prosthesis replacing teeth #26, #25, #24, #23, #22, #21, #20, and #19. In the region corresponding to tooth #31, there was a fractured metal pin.

Figure 1. Initial clinical aspect.

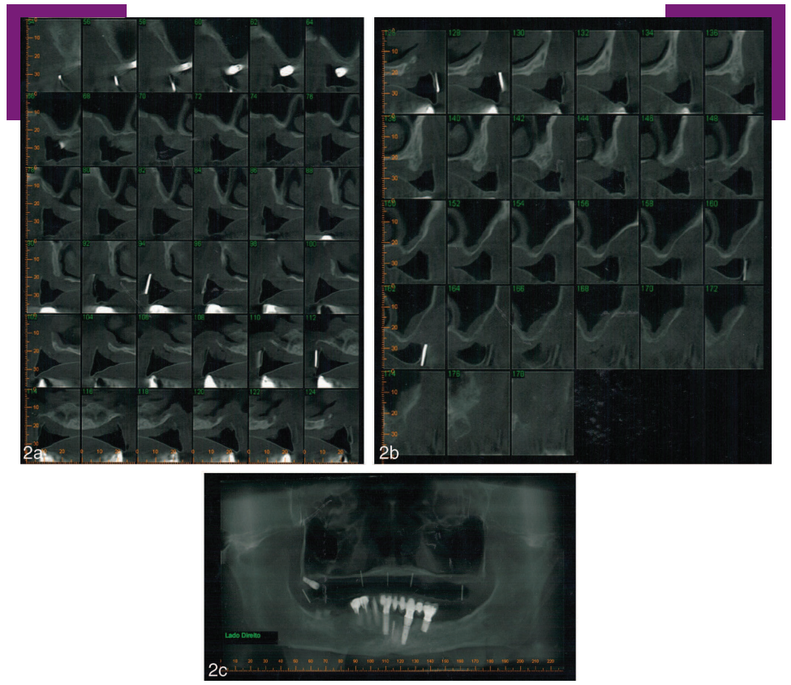


Figure2. Initial cone beam computed tomography. (a) and (b) refers to transversal reconstruction and (c) panoramic reconstruction. Observe the severe maxillary atrophy, bilateral pneumatization, and the absence of opacification of the maxillary sinuses.

A treatment plan was based upon the placement of 3 zygomatic implants in the right maxilla and 1 zygomatic and 2 conventional implants in the left maxilla. Prosthetic planning was performed prior to initiation of the surgical procedures.
Initially, teeth #31, #29, #28, and #27 were extracted and the prosthesis was removed. Two implants with Morse taper interface (Alvim CM, Neodent, Curitiba, Brazil) were placed in the regions corresponding to teeth #27 and #28, and implant-supported fixed prosthesis was installed.
In the next phase, surgical procedures were performed in the maxilla under general anesthesia. Initially, a mucoperiosteal incision was performed above the maxillary mucogingival line, from the region corresponding to teeth positions #3 to #7 and the region of teeth positions #14 to #10. Thus, 3 zygomatic implants with Morse taper interface were installed on the right side (Figure 3), 1 zygomatic implant

with a Morse cone platform on the left side and 2 cylindrical implants interface (Titamax CM, Neodent, Curitiba, Brazil) in the region of teeth positions #12 and #13 (Figure 4). An installation torque greater than 40 N.cm was obtained in the placement of all implants, allowing the use of immediate load protocol. Mini-pilar and transepithelial abutments (Neodent. Curitiba, PR, Brazil) were installed on the conventional and zygomatic implants, respectively (Figure 5). Postoperatively, the use of antibiotic (amoxicillin, 500 mg), anti-inflammatory (ibuprofen, 600 mg) and analgesic (paracetamol, 750 mg) drugs were prescribed. Clinical, radiographical and tomographical examinations revealed absence of all teeth in the maxilla and the presence of an osseointegrated nonfunctional implant in the region corresponding to tooth #1.

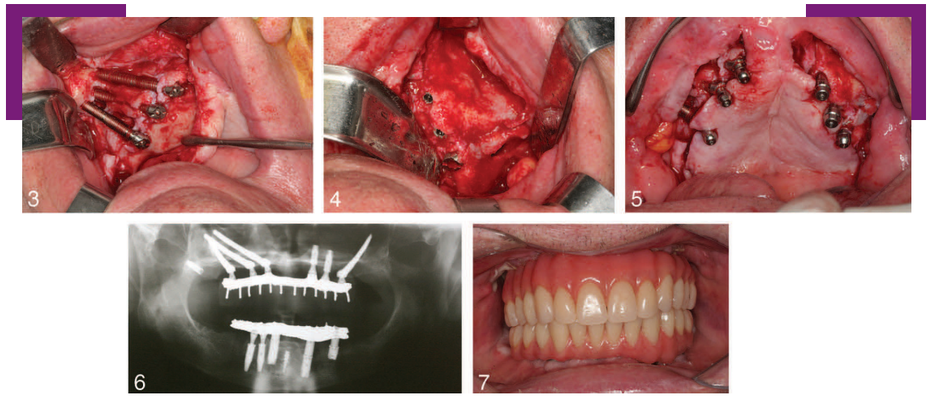


Figure 3-7. Placement of 3 zygomatic implants in the right maxilla using immediate loading. Figure 4. Placement of 1 zygomatic implant and 2 conventional implants in the left maxilla using immediate loading. Figure 5. Placement of abutments and protective caps. Observe the formation of a polygon. Figure 6. Immediate postoperative panoramic radiograph of the maxilla. Figure 7. Installation of complete maxillary metal-resin prosthesis over implants in the maxilla.

This implant was not removed in order to avoid communications or bone resorption in this region. Moreover, it was detected that there was extensive bone resorption with bilateral pneumatization of the maxillary sinuses aggravated by the previous use of a subperiosteal implant (Figure 2). In the mandible, the following teeth were missing: #18, #19, #20, #21, #22, #23, #24 ,#25, #26, and #30. Teeth #31, #29, #28, and #27 had severe periodontal disease with mobility. There was also the presence of 3 osseointegrated implants in regions corresponding to teeth #26, #22, and #20, which supported a metal-ceramic fixed prosthesis replacing teeth #26, #25, #24, #23, #22, #21, #20, and #19. In the region corresponding to tooth #31, there was a fractured metal pin.

Postoperative follow-up was performed at 9 (Figure 8), 17 (Figure 9), 28 (Figure 10), 36 (Figure 11), and 55 months (Figure 12), including clinical and radiographical examinations.

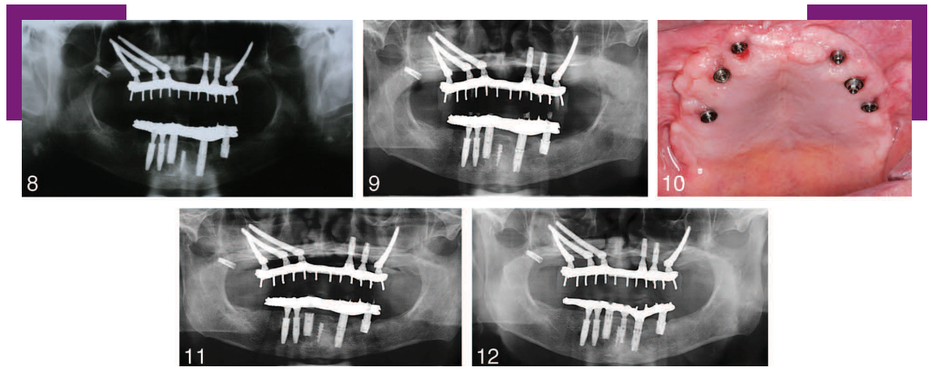


Figure 8. Radiographical follow-up at 9 months postsurgery. Figure 9. Radiographical follow-up at 17 months postsurgery. Figure 10. Clinical follow-up at 28 months postsurgery. Figure 11. Radiographical follow-up at 36 months postsurgery. Figure 12. Radiographical follow-up at 55 months postsurgery.

Taken together, these findings suggest that the use of multiple zygomatic implants in the rehabilitation of extremely atrophic maxilla is a safe and predictable technique, an excellent alternative to bone augmentation procedures. However, the placement of these fixtures must be considered a complex surgical procedure and requires experienced surgeons, considering that important anatomic structures may be involved.

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