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Editorial

Dear Researcher,

We have the great pleasure to entry the third edition, volume one, of the ***Journal of Surgical and Clinical Dentistry - JSCD****.*

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Happy reading!

Mário dos Anjos Neto Filho
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Summary

ORIGINAL ARTICLE

CASE REPORT

LITERATURE REVIEW

ANALYSIS OF STABILITY OF COLOR RESIN COMPOSITE UNDER THREE CONCENTRATIONS CARBAMIDE PEROXIDE

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ABSTRACT

The objective of the present study was to analyze the color stability of a composed resin that was submitted to three performed at the Severino Sombra University's Odontology Laboratory - Vassouras, Rio de Janeiro State, Brazil. Forty specimens were prepared and divided into a groups for the preparation on the specimens a photopolymerizable resin Opallis®, (FGM, Joinville, SC): was used in the A3,5 color. For the photopolymerization of the specimens, a photopolymerizer (Coltoloux® LED) was used for two hours diary of exposure. There different concentrations of carbamide peroxide were selected 10%, 16% and 22%. The readings to evaluation of the colors were performed by the reflectance spectrophotometer (Vita, Germany). The results showed alteration of color in the specimens that were exposed to the tree concentrations of carbamide peroxide.

KEYWORDS: Carbamide peroxide, composed resin, bleaching.

1. INTRODUCTION

The concern with aesthetics is not unique to modern society, since there are reports that the Greeks, in ancient civilization, already used vinegar associated with abrasive substances in an attempt to whiten your teeth[1].

The constant and increasing demand for cosmetic procedures has led many patients and, sometimes dentists, to use indiscriminately therapy tooth whitening, viewed as a supposedly non-invasive procedure. However, a growing number of reports on the adverse effects of tooth whitening, as the induction of structural changes on dental hard tissues[2,3], in the oral soft tissues and also in restorative materials[4,5].

Many other professionals dedicated to the study of chemical solutions to lighten discolored teeth. Among them we can mention: Woodnutt (1860)[6] and Truman (1881)[7], liquor labarraque; M'Quillen (1867)[8], calcium hypochlorite; Harlan (1884)[9] aluminum associated with hydrogen peroxide 3%; Kirk (1893)[10], sodium dioxide; Abbot (1918)[11], hydrogen peroxide 30%; Prinz (1924)[12], sodium perborate; Salvas (1938)[13] sodium perborate and water; Nutting & Poe (1963)[14], sodium perborate with hydrogen peroxide (30%) and heat.

Historically, evaluating the aesthetic component of teeth, it is observed that the chromatic feature has always been one of its fundamental attributes, existing records of procedures aimed at letting the lighter teeth that date back more than 2000 years[15].

The change in color of teeth can be due exogenous, endogenous, pharmacological, and iatrogenic factors yet to trauma with rupture of blood vessels in the coronal pulp[15,16].

A technique that can be self administered by the patient under the supervision of the dentist is carbamide peroxide 10%. This concept has undergone several modifications over the years with respect to the concentration used[17].

To Jorgense & Carroll (2002)[18], the whitening is the least invasive cosmetic to improve the appearance of smile procedure and can be performed with a high success rate.

Jardim *et al.* (2002)[19] observed that changes found in the translucency of composite resins against bleaching agents may be related to the type of each composite particle. Therefore, before performing tooth-whitening treatment, the physician must inform the patient about the possibility of changes occur in the present restorations.

According Canay *et al.* (2003)[20], the concentration of the bleaching gel also affects the change in the material. The literature shows that bleaching agents with high concentrations of peroxides increase the chance of discoloration of the restorations.

Musanje & Ferracane (2004)[21], evaluated the effects of various types of surface treatment on the properties of the experimental composites containing nanoparticulate different concentrations of monomers TEGDMA, UDMA and BIS-GMA. The results showed that the organic matrix of these composites were changed when the whitening gel were exposed to the materials.

Anusavice (2005)[22], show that the resins are packed crosslinked polymeric materials, reinforced by a dispersion of amorphous silica, glass, crystals or particles of inorganic and/ or organic short fibers to the matrix resin together by a bonding agent loading. Due to the wide use of this aesthetic material, which is the highest number of stability studies towards treatment with bleaching agents?

During his research in the 90s, Anusavice (2005)[22] observed the effect of carbamide peroxide 10% compared to composites and noted an increase in the translucency of the restorative material to use this agent in homemade teeth whitening technique. This increased translucency of resin materials can occur through having exposure of free radicals in the decomposition of composite resin.

The vital tooth whitening is a dental procedure is performed through the application of gels based on hydrogen peroxide and / or carbamide different concentrations are used to varying the time of application[23].

The teeth whitening peroxide occurs due to its low molecular weight facilitating the penetration of the dental structures, associated with dental permeability, a feature that allows the diffusion of oxygen through the enamel and dentin to act on the organic structures of the tooth and thus lighten it[24].

Bagheri *et al.* (2005)[25] mention the addition of chemical compounds in the composition of restorative material such as changes of physical properties. For example, the use of different proportions of diluents such as TEGMA to modify the handling properties of the base material of Bis-GMA, can affect the aesthetic properties of the restorer material.

The carbamide peroxide decomposes after contact with saliva, giving as the final compound hydrogen peroxide, which is a strong oxidizing agent that acts on the protein degradation mechanism, causing change in interprismatic region formed by the enamel proteins amelogenin and non-amelogenins[26].

According Hubbezoglu *et al*. (2008)[27], this cleaning depends on the structure of the monomer, the volume of the resin matrix and the size and concentration of filler particles of the restorative material.

Yu *et al*. (2008)[28], demonstrated colorimetrically that carbamide peroxide 10%, 15% and hydrogen peroxide are able to modify the color of microhybrids composites of nanoparticles and microparticles. Moreover, these resins become more susceptible to surface staining, factors that may require replacement.

Silva *et al.* (2009)[29], disclosed that the majority of published research on the subject agree that the color change of composite restorations after bleaching occurs due to a cleaning surface that promotes whitening agent on the surface of the restorative material. The color stability is the property of the material.

In some cases, the teeth to be whitened feature composite resin restorations that often come in contact with bleaching agents. If so, the professional must be aware of the effects of bleaching agents on restorative materials so that it can indicate whether or not the replacement of the restoration. Thus, a relevant factor to be explored in the literature is the direct contact of the whitening gel in resin composite restorations alters the physical properties of the restorative material[30].

The color stability is the property of a material that allows the color to be maintained for a period of time in a given environment[31].

The objective methods of assessment objectives are quantified color in color parameters tests[32], and can be performed through two devices: colorimeter and spectrophotometer. The colorimeter is a laboratory equipment not intended for dental use. This equipment is able to detect color differences below the threshold of visual perception[33] and to perform reliably, the quantification of the color of the test specimens used[34]. Therefore, some authors have chosen to use this method when making color measurements, such as Pisani *et al.* (2012)[35] and Sato *et al.* (2005)[36]. Already spectrophotometer, unlike the colorimeter is intended donation dental use by its easy handling. The device is an easy color analysis system used to produce accurate color measurements in clinical conditions[37], is more accurate than the visual and eliminates subjective errors in the evaluation of color[35].

Many studies have evaluated changes caused by bleaching agents in teeth, but the literature does not show that the gels can cause the composite, since many teeth are restored with this material. The aim of this study was to analyze the color stability of a composite subjected to three concentrations of carbamide peroxide.

2. MATERIAL AND METHODS

This study was conducted at the University Severino Sombra – laboratory of Odontology - Vassouras, Rio de Janeiro State, Brazil.

Test specimens:

Altogether, 40 test specimens were divided into 4 groups made. The test specimens were mounted in a silicone matrix and were left with the following measures: 5.62 mm diameter by 2.80 mm thick (Figures 1, 2 and 3).

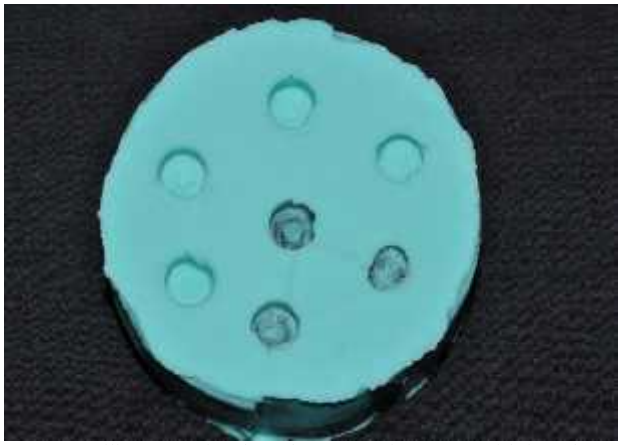

Figure 1. Silicone matrix where the test specimens were fabricated.

Figure 2. Diameter of the test specimens.

Figure 3. Thickness of the test specimens.

For mounting of the test specimens was used photopolymerizable resin Opallis® (FGM, Joinville, SC) The 3.5 in color (Figure 4).

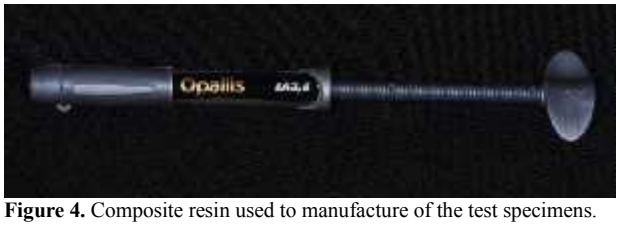

Figure 4. Composite resin used to manufacture of the test specimens.

For polymerization of the test specimens, the curing light (LED Coltolux®) was used for 60 seconds of exposure (Figure 5).

Figure 5. LED used for photopolymerization.

Three different concentrations of carbamide peroxide were listed have been selected (Table 1).

Table 1. Relationship of the concentration of carbamide peroxide in %.

Groups	Lightening Gel	%
GI (n=10)	Carbamide peroxide	10
GII (n=10)	Carbamide peroxide	16
GIII (n=10)	Carbamide peroxide	22
GIV (n=10) Control	_____	_____

The test specimens of composite resin were respectively subjected to exposure of the whitening gel composed of carbamide peroxide 10%, 16% and 22% Whiteness® (FGM, Joinville, SC) for 14 days for two hours a day (Figure 6).

Figure 6. Carbamide peroxide. Concentrations of 10%, 16% and 22%.

In the control group made no application of gel, just the color of the test specimens of composite resin before and after application of the gel in the other groups in order to validate the methodology used was evaluated.

Color Evaluation

The readings for color evaluation was performed by the technique of reflectance spectrophotometry using a hand-held spectrophotometer Easyshade Vita (Vita, Germany). This portable device for presenting the sensor tip with reduced diameter, allows assessment of small areas.

For the readings, each test specimen was placed in a room with controlled lighting (corresponding to the universal white). The readings were taken in the center of the test specimen. In addition, the spectrophotometer was calibrated before each reading. Each reading has always had the same angle of the sensor tip in contact

with the surface of the test specimens. A block of foam was used with the aim of reducing the entry of ambient light.

Vita Classical scale was mounted lighting tooth to verify the darker the color change points in facilitating the counting and statistical.

Figure 7. Vita Classical scale.

Data were recorded and stored using a spreadsheet. Initially, the first color evaluation, considered T0 was performed. At the end of 14 days of immersion in bleaching gels, the second reading of color (T1) was performed. The readings were performed by spectrophotometer. Before each measurement of each color specimen was gel was removed, washed with distilled water and dried with paper towels.

The color variation of gels of different concentrations of carbamide peroxide compared to the control group, was determined with regard to maintenance, lightening and darkening of the color of composite resin.

For more reliable to evaluate the effectiveness of different concentrations on changes in color of the composite results, ANOVA was applied and then the multiple comparison Tu-key-Kramer test, without considering the control group. Considering the control group, the "t" of paired samples with each concentration of carbamide peroxide test was applied. For both tests was considered the color change with values 01-05.

For all statistical inferences Microsoft Excel and GraphPad Software programs were used, with a significance level of 5% ($\alpha = 0,05$).

3. RESULTS

The control group, as expected, retained 100% of its color unchanged (Table 2, Figure 8) after 14 days without application of whitening gel.

The use of the composite carbamide peroxide Opallis® (FGM, Joinville, SC) containing 10% (Group 1), resulted in 100% resin whitening, as shown in Table 3 and Figure 9.

Table 2. Results of changes of the test specimens in the control group.

Control Group			
Test specimen	Before	After	Color Change
1	A3	A3	Remained
2	A3,5	A3,5	Remained
3	A3,5	A3,5	Remained
4	A3,5	A3,5	Remained
5	A4	A4	Remained
6	A3	A3	Remained
7	A3,5	A3,5	Remained
8	A4	A4	Remained
9	A3	A3	Remained
10	A4	A4	Remained

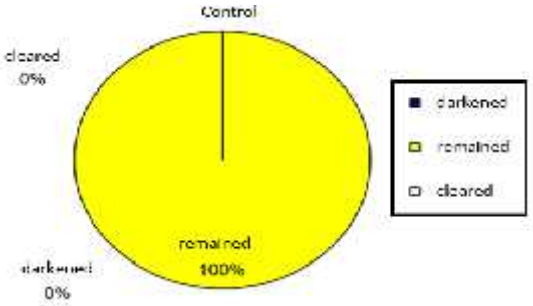

Figura 8. Control group.

Table 3. Results of changes of the test specimens with the use of 10% carbamide peroxide.

Group 1 - 10%			
Test specimen	Before	After	Color Change
1	A4	C2	Cleared
2	A4	B3	Cleared
3	A4	A3	Cleared
4	A4	A3,5	Cleared
5	A4	B4	Cleared
6	B4	B3	Cleared
7	A3,5	B3	Cleared
8	A4	B3	Cleared
9	A4	B3	Cleared
10	A4	B3	Cleared

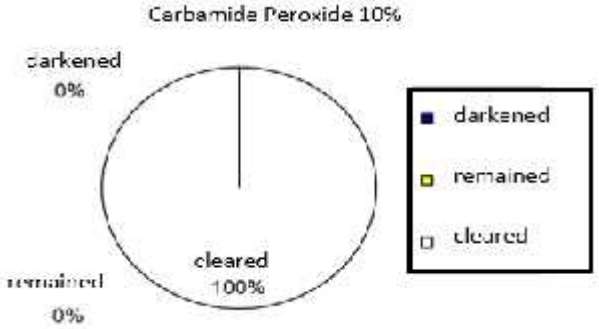

Figure 9. Changes of the group 1 (G1).

Regarding the use of the composite Opallis® carbamide peroxide (FGM, Joinville, SC) at a concentration of 16% (Group 2) resin resulted in a 50% bleaching, 40% no change of color and darkening of 10% (Table 4, Figure 10).

Table 4. Results of changes of the test specimens with the use of carbamide peroxide 16%.

Group 2 - 16%			
Test specimen	Before	After	Color Change
1	A4	B3	Cleared
2	A3,5	A3,5	Remained
3	B4	B3	Cleared
4	B3	B3	Remained
5	B4	A4	Darkened
6	B3	B3	Remained
7	A4	B3	Cleared
8	A4	A3,5	Cleared
9	B3	B3	Remained
10	A4	B3	Cleared

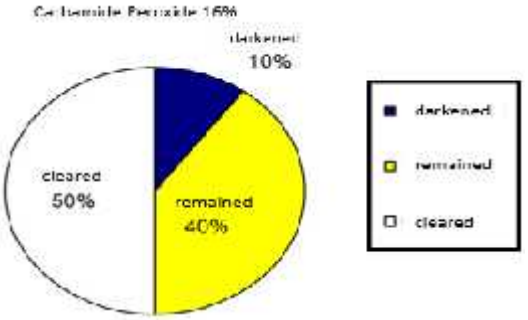

Figure 10. Changes in group 2 (G2).

The use of the composite carbamide peroxide Opallis® (FGM, Joinville, SC) with concentration of 22% (Group 3), 50% resin resulted in bleaching, 40% and 10% dimming without color change (Table 4, Figure 5).

Table 5. Results of changes of the test specimens with the use of carbamide peroxide 22%.

Group 3 - 22%			
Test specimen	Before	After	Color Change
1	A4	B3	Cleared
2	A4	B3	Cleared
3	A3	A3,5	Darkened
4	B4	B4	Remained
5	A3	B3	Darkened
6	B4	B3	Cleared
7	A3	B3	Darkened
8	A3,5	B3	Cleared
9	A3,5	A4	Darkened
10	A4	B4	Cleared

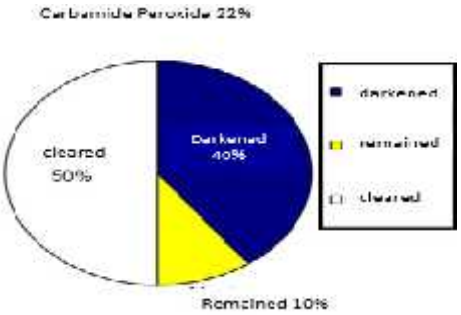

Figure 11. Changes in Group 3 (G3).

The ANOVA test showed that different concentrations showed significant differences (p = 0.0065, F = 4.806) for color (Figure 12). The Tukey-Kramer applied subsequently charged differences between the gel carbamide peroxide at 10% and bleaching with the use of carbamide peroxide at 22% gel.

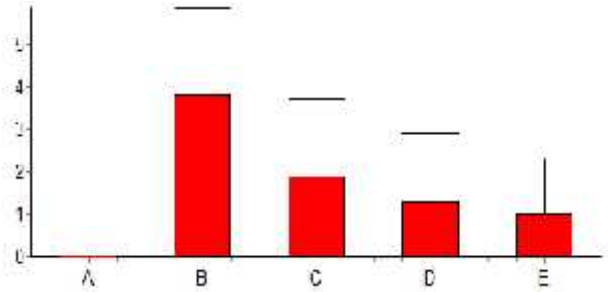

Figure 12. Changes in mean color change (from 01 to 05) in accordance with the different concentrations of carbamide peroxide, and also those who have kept the computed color. A: control group; B: carbamide peroxide gel than 10%; C: carbamide peroxide gel 16%; D. gel carbamide peroxide 22% with whitening; E. gel carbamide peroxide 22% with darkened. Vertical bars indicate standard deviation.

The "t" test applied between the means of the control group (zero) and the mean value of color variation of carbamide peroxide gel 10% (3.4 ± 1.350), showed highly significant differences (p <0, 0001, t = 7.965). In relation to mean the control group and the variation of color carbamide peroxide gel 16% (1.9 ± 1.792) showed significant differences (p = 0.0085, t = 3.353). Now, in relation to the mean of the control group and the color range of carbamide peroxide gel that cleared 22% (1.3 ± 1.636) and the color range of carbamide peroxide gel 22% which darkened (1.0 ± 1.333) showed significant differences: p = 0.0332, t = 2.512 and p = 0.0418, t = 2.372, respectively.

4. DISCUSSION

There are many studies on the effects of bleaching agents on the enamel and dentin. However, there are still few studies that talk about these changes in the composites. Measures such as targeted in this study are essential for the improvement of various types of composite resins

and gels and whitening for best results and satisfaction of patients who wish to have their teeth whitened.

The composites are filled crosslinked polymeric materials, reinforced by a dispersion of amorphous silica, glass, crystals or particles of inorganic and/ or organic short fibers to the matrix resin together by a bonding agent loading. When subjected to home whitening, modifications can be found in the translucency of resin composites. The organic matrix composites are changed when the whitening gel comes in contact with the materials[19,21,22]. In the current study, there was color change in different concentrations of carbamide peroxide, and 16% in the concentration of the specimens of composite resin remained stable in their colors in 40% of group.

Studies have shown that, by colorimetry, carbamide peroxide 10% and hydrogen peroxide are able to modify the color of microhybrid composites of nanoparticles and microparticles. What goes against the experiment of the present study where there was 100% bleaching of group I. Most of the published research on the subject agree that the color change of composite restorations after bleaching occurs due to a surface cleaning promotes the whitening agent on the surface of the restorative material[28,39], agreeing with the present study.

The concentration of the whitening gel also affects the change in the material. The literature shows that bleaching agents with high concentrations of peroxides increase the chance of discoloration of the restorations, as a strong oxidizing agent that acts on the degradation mechanism causes a change in interprismatic region formed by the enamel amelogenin proteins and not-amelogenins[20,26]. In the present study, there was a higher percentage of test specimens whitened proof when subjected to carbamide peroxide gel 10% (GI cleared 100%). The groups GII and GIII, also vary, but not significant in the rate of whitened as the GII. Interestingly, the gel concentration at 22% was able to darken 40% of the test specimens. Before performing the bleaching treatment, the physician must inform the patient about the possibility of changes occur in the present restorations. In this study, the test specimens of composite resin had its color changed in different concentrations of carbamide peroxide[19].

The objective methods of color evaluation are quantified in color parameters and tests can be performed through two devices: colorimeter and spectrophotometer. The colorimeter is a laboratory equipment not intended for dental use, but is able to detect color differences below the threshold of visual perception. Already spectrophotometer, unlike the colorimeter is intended for dental use is more accurate than the visual and eliminates subjective errors in the evaluation of color[39]. Agreeing with the above work, in the literature there are several authors who used the objective method in their research. For reading achievement of color in this research spectrophotometer Vita Easyshade that offered precision Vita Classical scale was used. To determine whether there was a color change, Vita Classical scale was mounted to the lighter darker, unlike which is sold as separate groups (A, B, C and D).

5. CONCLUSION

According to this study and based on the results obtained through the methodology, it was suggest:

- Among the different concentrations of carbamide peroxide, which presents with a concentration of 10% was able to clear all test specimens of composite resin (statistically significant).
- The carbamide peroxide at 16% cleared 50% of the test specimens of (statistically significant) composite resin.
- The carbamide peroxide at 22% cleared 50% of the test specimens of composite resin, darkened 40% (statistically significant).

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AESTHETIC REFERENCES TO TOTAL IMMEDIATE PROSTHESIS: CASE REPORT

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ABSTRACT

The aim of this case report was to registert the prosthetic and surgical planning of rehabilitation of a patient who came to the clinic of the University Severino Sombra (USS) Vassouras, Rio de Janeiro State, Brazil, demand for a immediate full denture. The proposal was achieved because with the extraction of the remaining teeth and the installation of total immediate dentures returned to the patient esthetics, phonetics, improving the physiology of the stomatognathic system, providing a better quality of life.

KEYWORDS: immediate total prosthesis, caries, periodontal disease.

1. INTRODUCTION

According to the glossary of terms prosthetic, the immediate denture is defined as a complete or partial denture, made to be installed immediately after extraction of natural teeth[1].

This type of rehabilitation that seeks to fully restore the stomatognathic system, can provide anatomical, functional, aesthetic and psychological advantages. In the case of adaptation immediately after dental extractions, immediate dentures allow total control of hemorrhage, trauma protection, protection against exogenous infections, speed healing, phonetics, less noticeable transition from dental condition, suppression of the collapse of the neuromuscular system and less time wasted on social activities[2].

The ultimate goal of the prosthesis is offering comfort to the patient, allowing it to speak unhindered, chew food efficiently, have a rest position and, in addition, be adequately well built considering the aesthetic factors[3].

The indication of the total immediate dentures is when the remaining teeth are condemned to extraction. On the other hand the contraindications of this treatment is passed on cases of advanced periodontal disease, patients whose physical and/ or mental state is not compatible with an invasive surgical procedure, pathological changes that require large tissue removal, lack of cooperation and agreement of the patient, as well lack of technical and scientific capacity of professional[4].

Tooth decay is the main reason that leads the individual to extract the tooth. Being influenced by the social and economic condition[5].

The success or failure of therapy, for prostheses depends on several factors such as: professional-patient relationship, the patient's attitude towards the use of prostheses, personality, and also factors related to the quality of the prosthesis and the oral condition of the patient. We anatomical advantages as maintaining the vertical dimension, preventing the expansion of the language and the preservation of normal patient anatomy and aesthetic because it prevents facial structures to commit, facilitate aesthetic modifications and correction of wrinkles providing more natural appearance[6].

It is important to assess the brakes and bridles, after installation of the prosthesis within the oral cavity and may be extended beyond normal, preventing proper seating of the denture base; evaluation of the occlusion, it influences the stability and retention of the prosthesis, which will cause other problems such as chewing, comfort and others; evaluation of the area of compression must be eliminated to give greater physical, psychological and functional efficiency comfort for the patient; assessment of aesthetics and phonetics, to be feeling well the patient[7].

It is advocated a molding technique for TIP (total immediate prosthesis) maxilla in posterior edentulous patients bilaterally, in which the trays, rollers have wax in edentulous part, producing greater reliability of mus-

cle movements[8].

Various materials can be used for functional moldings, so that the correct choice should be based on a material that is comfortable to the patient and the professional[9].

The reline is indicated for immediate dentures; prosthetic patient unable to go to the dentist; prostheses low-income patients, being contraindicated when severe bone resorption, presence of temporomandibular disorders, orofacial pain, inflamed mucosa or hyperplastic support, large tooth wear, poor positioning of artificial teeth, premature contacts or interference, loss of vertical dimension is greater 3 mm and lack of interocclusal space. This procedure can be performed directly or indirectly[10].

Upon installation, the dentures will be adjusted to support tissues, favoring the retention, stability and comfort. The latter is closely related to the true copy of the morphology of the settlement area of the prosthesis and acts positively on patient compliance[11].

Regarding care after installation, emphasizes the constant cleaning of the prosthesis and the optimal settings performed by a dentist responsible[12].

For most dentists, much of the interest ends when the patient completes the treatment, which compromises the prognosis of work performed and has a negative impact on oral health of the patient[13].

The alveolar bone resorption process is continuous throughout the life of edentulous patients. An option to condition the mucosa and to improve the adaptation of the prosthesis is the direct or indirect relining, with acrylic resin for immediate soft foundation, in patients with immediate functional or aesthetic needs[14].

The assembly phase of artificial teeth seems to be for professionals and their patients the greatest concern, because of the aesthetics, both receive the first full denture patients want is resembles as much as possible with natural teeth[15].

The aim of this case report was to registert the prosthetic and surgical planning of rehabilitation of a patient who came to the clinic of the University Severino Sombra (USS) demand for a immediate full denture.

2. CASE REPORT

Patient male gender, 63 years old, sought the Dental Clinic of the University Severino Sombra - Vassouras - RJ. Main complaint the patient reported poor hygiene and would like to extract all the teeth to wear prosthesis. In history it was found that the patient is a former smoker, mouth breathing, controlled hypertensive and takes drugs. When intra-oral clinical examination showed the teeth 15, 11, 21, 23, 26, 27, 35, 34, 33, 32, 31 and 45 (Figures 1 and 2), all committed to caries and periodontal disease and bone recession edentulous in parts. Except teeth 15:45 (kept the vertical dimension of occlusion), all other suffered extrusion. The request of periapical and panoramic radiographs was done as a complementary examination in order to assist in planning (Figure 3).

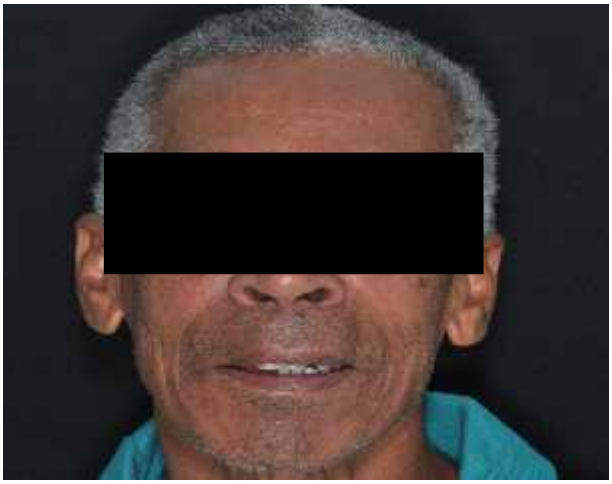

Figure 1. Initial photographic record of the patient.

Figure 2. Intra oral clinical aspect of the patient.

As a treatment option was offered to the patient multiple extractions of remaining teeth and making two total immediate dentures, since the extrusions, caries and periodontal disease precluded other treatment options.
Early in the treatment was made with alginate molding, then was made the plaster model and the evidence base with acrylic resin and wax rollers with 7 semi-mount adjustable articulator for study and planning of the event (Figures 4 and 5).

Figure 4. Lower gypsum model based test and wax roller 7.

Figure 5. Upper plaster model based test and roller wax 7.

With the aid of the impression compound, three points were marked at the upper fork assembly model through the facial bow in the semi-adjustable articulator (Figures 6, 7, 8 and 9).

Figure 6. Fork with markup Godiva.

Figure 7. Mounting face bow.

Figure 8. View in 45 semi adjustable articulator.

Figure 9. View in semi adjustable articulator.

Digital caliper was used to obtain the measure of wear to be made on the plaster model. The marking on the upper central incisor was 2.12 mm after the lip line at rest, and the lateral incisor was of 5.00 mm above the lower lip at rest. Obtained after the measurements were made the wear on the plaster model and reconstructing the anatomy of the smile line providing a favorable aesthetic in order to guide the technician Prosthodontics (TPD) for proper assembly of artificial teeth (Figures 10, 11, 12, 13 and 14).

Figure 10. Measurement of wear of the maxillary central incisor marked the caliper.

Figure 11. Measure wear marked lower lateral incisor in caliper.

Figure 12. Confirmation of the measure in the upper plaster model.

Figure 13. Adjust the lower plaster model.

Figure 14. Model upper and lower set gypsum.

The job was sent to the TPD for making the total immediate dentures with the color selected with the STG scale (Vipi, Pirassununga, SP) (Figure 15) gums. As he had no switch for selecting color of teeth, was selected A3 color scale VITA Classical (Vita, Germany).

Figure 15. Color selection of gum.

Multiple extractions of remaining teeth and the immediate installation of denture reline with using Resin Soft Confort Soft (Dencril, Pirassununga, SP) and then occlusal adjustments were made (Figures 16, 17, 18, 19 and 20) were performed.

Figure 16. Patients after surgery.

Figure 17. Total prosthesis.

Figure 18. Resin Soft Confort Soft to reline of dentures.

Figure 19. Lower prosthesis.

Figure 20. Upper dentures.

The patient was instructed regarding the hygiene of the prosthesis with brushes, toothpastes, soaps neutral avoiding calculations and other types of damage caused by poor hygiene.

After a week the sutures were removed, and it was done again with the reline acrylic resin confort.

Finished installation was outstanding patient satisfaction regarding the dentures reaching the desired goal at the beginning of treatment, clearly providing a better quality of life (Figure 21).

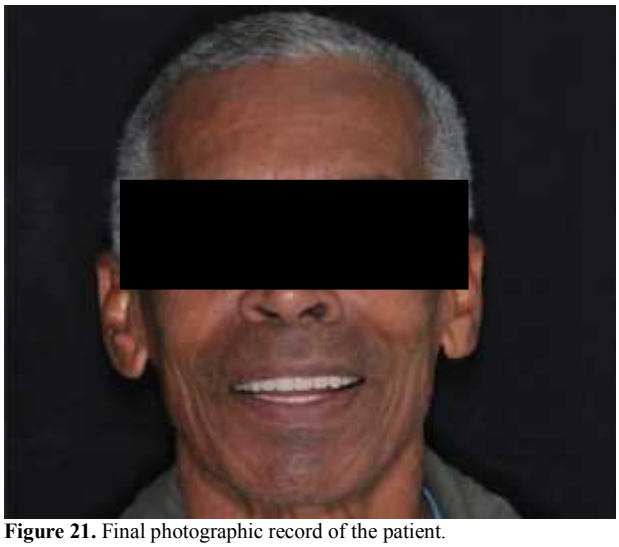

Figure 21. Final photographic record of the patient.

3. DISCUSSION

The treatment plan of the patient and the necessary procedures for immediate installation of complete dentures were performed after extraction of the remaining teeth [1]. This study aimed to provide functional, aesthetic and health of the stomatognathic system reestablishment besides other advantages [2,3].

This planning surgical prosthetic was established after conducting a thorough clinical examination of the entire masticatory system, complete and panoramic, periapical radiographic laboratory, questionnaire semiological and psychological evaluation of the patient regarding their expectations of treatment to assess the risks and contraindications[4].

The remaining teeth had unfavorable and in full presence of caries periodontal situation, one of the main factors to multiple extraction[5].

We can observe to the treatment that the patient returned its vertical dimension and aesthetics and have succeeded in therapy with the patient-professional relationship with the patient's attitude towards the use of prosthetics and oral condition of the patient.[6.]

It is important to evaluate the occlusion[7]; the measure was measured using the digital caliper to delimit the extent adapted to be worn in the semi adjustable articulator plaster model and then sent to the TPD for anatomical rehabilitation of occlusion and alignment of the teeth in the arch line, thus improving the aesthetic sense of well-being, physical comfort and psychological.

The material was used for molding alginate, providing an efficient and rapid technique for the professional and the patient [9].

The option of direct relining immediate dentures done in this case seeks to reestablish beyond aesthetics and masticatory function, condition the mucosa to receive a prosthesis in the future with the best fit, stability and retention[10,11].

The patient was instructed to perform a thorough cleaning after all the food and sleep was also instructed to attend Dental Clinic periodically to review and adjustments if necessary[12,13].

Although good planning capabilities, high quality, choice of TPD of great technical ability and all care at all stages of preparation of this work materials have been used, the patient was warned about the limitations of hearing aids, adjustment period for chewing and phonetics, periodic maintenance and home office, making more realistic expectations, avoiding a conflict of professional patient relationship and the end of work[15].

4. CONCLUSION

We conclude that the objective was achieved because with the extraction of the remaining teeth and the installation of total immediate dentures returned to the patient esthetics, phonetics, improving the physiology of the stomatognathic system, providing a better quality of life.

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REINSTATEMENT OF FUNCTION AND AESTHETICS WITH THE BRACKETS PROVISIONAL FIXED IN PATIENT WITH CHRONIC LOCALIZED PERIODONTITIS

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ABSTRACT

Periodontal disease affects the periodontal ligaments, and the supporting tissue destruction caused by bacterial toxins or by induction of an immunopathological response and, consequently, the tooth loss occurs. This tooth loss alters both the occlusion and esthetics of the patient and this fact might cause psychosocial problems. In order to reduce this discomfort and restore proper function to the patient a dental intervention is required. In this case report, the patient was diagnosed with advanced localized chronic periodontitis, leading to loss of tooth 31 and 41. The goal of treatment was to restore the function and aesthetics for the patient via immediate realization multidisciplinary planning including areas of Periodontology, Surgery, Orthodontics and Prosthodontics. The patient's expectations were met and the goal achieved, it returned aesthetics, function and kept the space of missing teeth immediately for a future definitive rehabilitative treatment.

KEYWORDS: Fixed orthodontic appliances, orthodontics, periodontics, prosthodontics, provisional with natural tooth.

1. INTRODUCTION

The literature describes that periodontal disease[1] is a multifactorial infectious affecting bone and periodontal ligament[2]. The gingival tissue edema and bleeding as a result of the disease can lead to bone resorption and tooth loss by the total elimination of connective tissue[2]. This destruction of connective tissue is determined by the virulence factor of the bacteria that directly damage tissue through the production of toxins or indirectly through the induction of immunopathological response[3].

Undoubtedly the loss of teeth causes numerous occlusal changes and consequently, aesthetic[4]. The mass media, especially television shows that people with beautiful smiles, induce changes in habits and customs of the population seeking dental offices in search of solution to your dental problems, taking into account their correlation with psychosocial problems from the standpoint of modern society[4].

Due to loss of some teeth because of the periodontal disease it is deemed necessary to the preparation of interim, so that the patient feels well waiting for the final restoration, providing him an improvement in aesthetics, phonetics and mastication[6].

This report aims to present a clinical case of oral rehabilitation combining different dental specialties with the aim of restoring aesthetics, phonetics and proper chewing to the patient via provisional with natural teeth fixed to the orthodontic brackets.

2. CASE REPORT

Patient (JFR), female, 28 years old, brown, was attended in a dental school clinic of University Severino Sombra (USS) - Vassouras (RJ), complaining of tooth loss 41. The patient was asked to take the tooth in the following query. The clinical examination was detected in advanced chronic periodontitis localized region of lower incisors with mobility grade III in tooth 31 (Figure 1) and radiographic examination was observed that the tooth 31 had no bone support (Figure 2).

Figure 1. Initial clinical aspect.

The treatment was interdisciplinary, involving Periodontology, Surgery, Prosthodontics and Orthodontics.

We started the session with supragingival clinical ultrasound with scrapes the teeth from 33 to 43, coronary polishing with rubber cup and prophylactic paste. Then infiltrative anesthesia was made in the bottom of the hall, to the tooth 31, thereby realizing the extraction of this; then was begun the making of immediate provisional using teeth 31 and 41 of the patient. The roots of the above teeth were cut 2 mm below the cementum enamel junction (CEJ) and the entries of the conduits of these teeth were etched with 37% phosphoric acid for 15 seconds and the adhesive applied to its proper sealing with light-cured resin (Figures 3, 4, 5 and 6).

Figure 2. Conditioned and sectioned teeth.

Figure 3. Teeth cleaned.

Figure 4. Application of adhesive at the entrance of the pulp chamber.

Figure 5. Sealing of the pulp chamber with composite resin after curing of the adhesive.

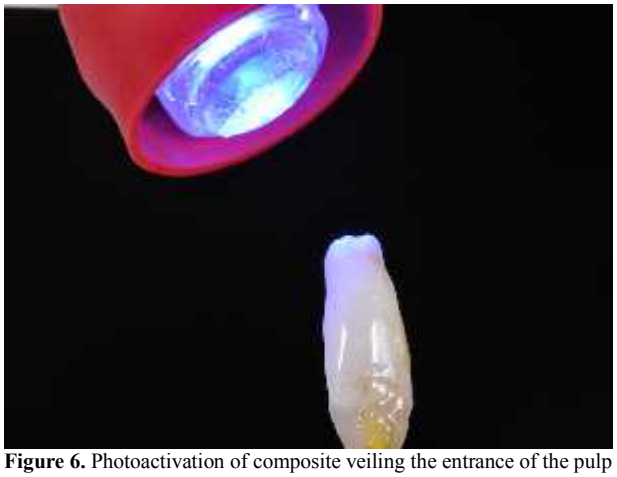

Figure 6. Photoactivation of composite veiling the entrance of the pulp chamber.

After sealing, the crowns of the teeth from 33 to 43 were etched with 37% phosphoric acid for bonding of orthodontic brackets 9 (Figure 7).

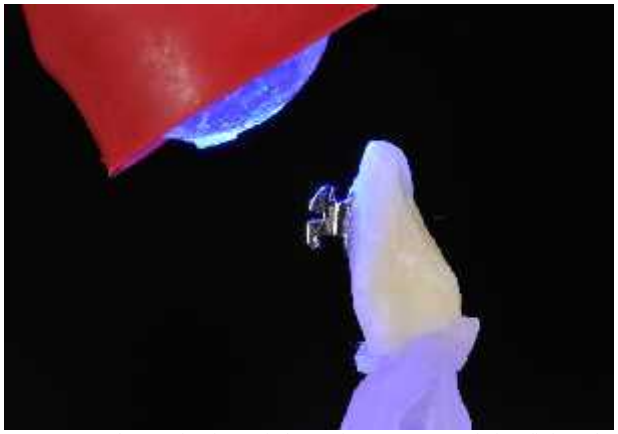

Figure 7. Photoactivation of the resin cement used for fixing the bracket.

The orthodontic appliance was installed for the purpose of securing the immediate provisional, which served as a space maintainer, and they stay stable was done a total ligature. The orthodontic force was applied to the minimum possible arc using Twist-Flex 0,15 and elastic bands (Figures 8, 9, 10 and 11).

Figure 8. Brackets fixed.

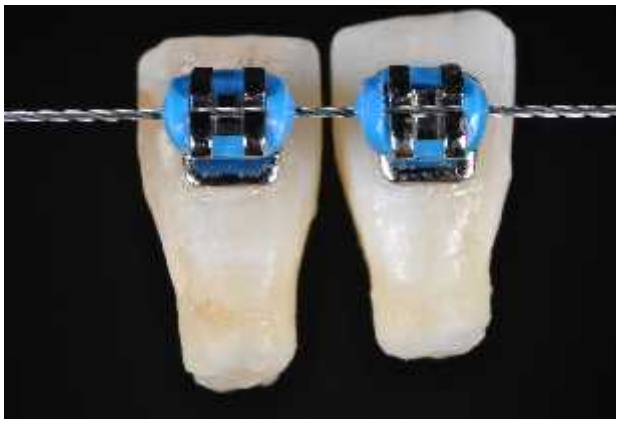

Figure 9. 31 and 41 teeth with brackets and wire.

Figure 10. Final clinical aspect.

Figure 11. Final Smile.

3. DISCUSSION

The accumulation of bacterial plaque causes tooth decay and periodontal infections, diseases that are more common in the oral cavity[7,8,9]. The prevalence of periodontal disease is directly linked to poor oral hygiene and is independent of age and socio-economic status[10,9] and, furthermore, advances in all regions and all classes permeate [9].

Dental caries, periodontal disease with destructive insertion loss started from chronic inflammatory gum disease, chronic systemic diseases, trauma, fractures, and social class are directly related to loss of teeth[11]. The loss of any tooth unbalanced occlusal relationships between the remaining teeth, decrease occurs because of chewing ability[11,12], modification of phonetic and cause cosmetic damage that can lead to psychological changes[12].

Although tooth loss is not a life threatening condition, this has an important impact in relation to social and functional limitations of the individual and the community[13]. Further, periodontitis can therefore increase the risk for development of systemic diseases[1,9] and some diseases such as diabetes and osteoporosis, can act as an aggravating periodontal disease[1].

The main features of chronic periodontitis are defined as low rate of progression, and can be mild to moderate, with episodes of rapid progression can come to pass; presence of local irritants compatible with the severity of the disease; and higher incidence in adults[14].

In many cases where the patient exhibits absence of one or more teeth becomes necessary to replace the provisional preparation of temporarily these edentulous spaces. The temporary treatment only has quality when considering your prosthetic function, such as protecting the tooth preparation, preservation of pulp-dentin complex and periodontal, maintenance of interproximal and occlusal spaces, aesthetics, among others[6]. In the present case the intention of the interim was made to keep the interproximal and occlusal spaces, aesthetics and proper function of the patient.

The most commonly used materials abragem provisional acrylic resins polyethyl methacrylate (ARPM) and poly-methyl-methacrylate (PMMA) and Bis-acryl composite resin[15,16]. According to the literature[17], the grip of a bracket to a prefabricated provisional acrylic resin is low, regardless of membership materials used, so this clinical case we chose to use natural provisional because the adhesion of light-cured resin, material choice for bonding of brackets, is greater in enamel, agreeing to study[18] which states that the technique of etching, adhesive and composite natural teeth promotes adhesion force greater than necessary.

Orthodontics is not only indicated for correction of malocclusion patients, it also has an important role in restorative and prosthetic treatments[4,19], this fact could be observed in the case reported in the orthodontic appliance was used to maintain stable natural provisional. The static arrangement of the teeth as well as a balance between the dental arches and an appropriate anatomy of each tooth group are related to a functional occlusion[19], so, the scope of aesthetics is necessary because of the

absence, especially earlier, dental elements generates a dissatisfaction with physical appearance and decreased self-esteem, influenced by aspects of valuing individual beauty[19,20,21].

4. CONCLUSION

The treatment has consolidated the expectations of the patient and professionals that conducted by returning the function and aesthetics and thus the degree of satisfaction was great on both sides, in addition it was possible to wait for the time to complete healing and maintain the spaces of missing teeth for a future rehabilitation treatment.

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LATERALIZATION OF THE INFERIOR ALVEOLAR NERVE

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ABSTRACT

Nowadays, with the growth in life expectancy of Brazilians, the search for oral rehabilitation through dental implants has increased considerably. In this case, the posterior region of the identous mandible, there is a bone resorption causing the bead to reduce, making it really difficult to install implants in this area. On the posterior mandible area, there is a special kind of care on the execution of this technique because of the presence of the inferior alveolar nerve. An alternative for these implant placements is the lateralization of the inferior alveolar nerve. The purpose of the study is to describe the technique of lateralization of the inferior alveolar nerve (TLIAN) through a clinical case, and show its importance in surgical planning and prosthesis, reducing the incidence of sensorineural dysfunction.

KEYWORDS: Dental Implants, mandibular never, bone resorption.

1. INTRODUCTION

In accordance with Toledo Filho *et al.* (2005)[1] the lateralization of the inferior alveolar nerve is one of the options for prosthetic rehabilitation of patients with bone defects or alveolar reabsorption moderate to severe in the posterior mandible, and who have intolerance to removable prosthesis.

Garg *et al.* (1998)[2] reported that bone pathophysiology, rapid and progressive bone resorption can occur after tooth extraction and is accentuated by the use of removable prosthesis. General systemic factors and local factors are responsible for the amount and the pattern of bone resorption observed in the alveolar process. This situation would result in a moderate or severe atrophy of the mandible.

According to Silva *et al.* (1999)[3], due to loss of teeth, the alveolar ridge undergoes a continuous and irreversible process of bone resorption in the vertical portion. Thus, the resorption of the posterior portion of the jaw usually leads to a lowered edge and, consequently, the placement of implants in these regions becomes challenging.

The posterior mandible bone features a quality inferior compared to anterior and in such situations short implants are installed to preserve the mandibular canal, however the initial implant stability is unicortical[4].

The lateralization of the IAN is a current technique, which has proved a good alternative treatment in cases of vertical atrophy[5]. This technique of lateralization of the inferior alveolar nerve (TIAN), have been developed to optimize the successful installation of mandibular implants[6].

Stellingsma *et al.* (2004)[7] described that there are some forms of treatment for atrophic posterior mandibular short implants among them, tilted implants and advanced surgeries such as distraction osteogenesis, interpositional graft and lateralization of the inferior alveolar.

According to Garcia Junior *et al.* (2006)[8], the technique of lateralization of IAN consists of exposing the nerve and gentle pull the same out of the mandibular canal laterally diverting its path and allowing implant placement and there is no interference with the incisive nerve. This technique has a low morbidity, if well executed, and provides stable results, enabling the fixation of implants in two cortical increasing resistance to occlusal forces and ensuring a good proportion between the implant and the prosthesis.

Research indicates that the smaller the length of the implant, the higher the failure rate, and the larger the diameter of the implant, the greater the bone loss marginally[9,10]. Implantation of 5 mm diameter and 6 mm in length has an area of bone contact of the implant similar to a 3.75 mm diameter by 10 mm length[11].

Griffin *et al.* (2004)[12] report that implants with less than 10 mm in length are associated with higher failure

rates and to maximize results, short implants should be joined together[13].

To Hori *et al.* (2001)[14], surgery lateralization buccal alveolar neurovascular bundle allows less often the placement of long bicortical implant and providing a good locking is essential for the osseointegration process, with the possibility, in many circumstances, the primary load stability early prosthetic or ready.

Grounded by the literature, the IAN lateralization is considered a high-risk surgery since this technique can cause numbness, paresthesia or complete loss of sensation in the region. In this case, it is essential that the professional who performs this maneuver have the field of operative technique in addition to anatomical knowledge of the area to be operated, as well as the mandibular canal and the physiology of the neurovascular bundle[15].

Some authors to be more precise in locating the mandibular canal various imaging methods, including conventional radiography in two dimensions, and periapical orthopantomographic can be used in addition to the CT[16,17,18].

Kan *et al.* (1997)[19] exposed several authors emphasized that in addition to surgery should be carefully indicated there full clarification and agreement of the patient, the type of procedure with its possible and almost inevitable sequelae, such as jaw fractures, temporary paresthesias and even irreversible.

Based on the above, the objective of this study is to describe by means of a clinical case, the technique of lateralization of the inferior alveolar nerve (TLIAN) and its importance in surgical planning and prosthesis, reducing the incidence of neurosensory disorders.

2. CASE REPORT

ROM Patient, female, 38 years old, shows no pathological condition. It was observed in panoramic radiography bone resorption in mandibular posterior region and the position of the inferior alveolar nerve (Figure 1).

On clinical examination was possible to observe the absence of teeth 44, 45,46,47,48 (Figure 2).

Preoperative Medication: antibiotic prophylaxis Starts 1 hour before the procedure with 2 mg of Amoxicillin, coupled with an ampoule of injectable Dispropan®. Anesthesia: regional block of IAN, Lingual Nerve and Oral Nerve and infiltrating the right side.

Trapezoidal incision biangular low or Peter Novak was performed. Then the mucoperiostal detachment with the peeler of Molt, exposing the lateral border of the mandibular body and the mental foramen the right side (Figures 3 and 4).

Figure 1. Panoramic radiography as a diagnostic test.

Figure 2. View of the initial region where the surgery will be performed.

Figure 3. View of the operated after the trapezoidal incision biangular lower region.

The osteotomy was made with a carbide drill to drill and nº6 for 702 straight piece, making the removal of cortical bone to get to the Inferior Alveolar Nerve. Then the detachment of this nerve was performed and used a drain Per Rose to fend Inferior Alveolar Nerve allowing the installation of dental implants (Figure 5 and 6).

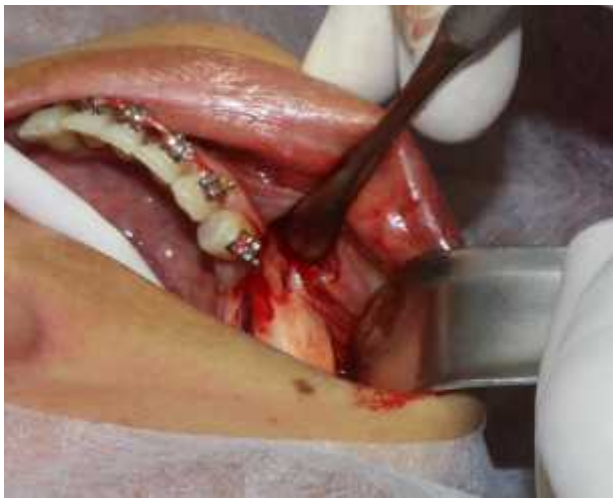

Figure 4. Location of mental foramen.

Figure 5. Osteotomy to remove the cortical window.

Figure 6. Inferior Alveolar Nerve Exposure.

A drilling for installation of dental implants and the type Neodent® EX External Hexagon 11mm x 3.75 mm was made soon after the installation the cortical bone was repositioned and sutures the scalloped type.

Postoperative medication: amoxicillin 500 mg (8/8 h, for 7 days), Ibuprofen 600 mg (6/6 h, for 3 days), Lisador® (35 drops, 6/6 h, for 3 days), Citoneurim® (5g single tablet daily, for 20 days) . After surgery, the patient reported paresthesia for two weeks.

Figure 7. Drilling for placement of implants.

Figure 8. implants already installed.

3. DISCUSSÃO

Ferrigno *et al.* (2005)[20] showed that the IAN transposition technique, when used in severely atrophied posterior mandible, allows the installation of appropriate length and good primary implant stability.

Several authors reported that for the technique and the lateralization of the inferior alveolar nerve transposition distance between the mandibular canal and

the alveolar ridge should be less than 10-11 mm[17,18,20,21,22,23].

Figure 9. Repositioning cortical bone.

Figure 10. Sutured tissue.

The literature shows no reports of contraindications for transposition and lateralization of the inferior alveolar nerve, provided there are no problems of systemic order[10,18,21,47,49]. However, the jaw may present an advanced process of resorption of the alveolar ridge, surgery for transposition and lateralization of the inferior alveolar nerve is contraindicated [48,50].

In the case presented the patient was in a state of unstable general health with no restrictions for the surgical procedure according to the literature [10,18,22,2324,25].

According to Garcia Junior *et al.* (2006)[8], studies showed that rates neurosensitivas recoveries are close to 100%. The principles of surgical technique, makes the lateralization of the inferior alveolar neurovascular structure a secure, viable and approval procedure by patients.

However, Rosenquist (1994)[24] reported that recovery of the neurosensitive disorders varies according to age, and is more time consuming in the elderly when surgical damage the traction of the inferior alveolar nerve. When the traction of the nerve is less than 5% function is restored from 4 to 6 months, when traction is greater perineural disruption may occur with prolonged paresthesia, or even the final paresthesia.

This study corroborates the literature studied, because the patient reported paresthesia in the inferior alveolar region of the right side after surgery and after two weeks there was a neurosensitive recovery.

According to Toledo-Filho *et al.* (2005)[1], the procedure can be time consuming, since it requires intense concentration, surgical team with experience and, especially, the selection of patients and elucidated aware about the risks and benefits of the technique.

4. CONCLUSION

For the literature review and presentation of clinical and surgical case, it can be concluded that:

The Inferior Alveolar Nerve Lateralization is an option for prosthetic rehabilitation in patients with alveolar resorption in the posterior edentulous mandible.

In TLIAN the use of long implants may be allowed.

The LIAN is a thorough technique, it can cause temporary sensory loss after the procedure

This same technique, when it is not possible to install short implants in posterior regions, patients who opt for treatment with dental implants need not extract the teeth prior to performing the technique of Branemark protocol.

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HUMAN TEETH BANK IN BRAZILIAN HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

In 1996, the first Human Teeth Bank (HTB) was established in Brazil. The HTB should be linked to Higher Education Institutions (HEI) and/or Research Centers, related to Dentistry. Its main objective supply the academic and scientific-didactic needs, thereby eliminating the illegal trade of teeth. After donated, the teeth are will be sterilized, cleaned and divided according your characteristics to loan to the subjects of the academy under previously conditions stablished. Considering the existence of legislation regulating the activities related to the use of human organs and tissues, there is the importance of the implementation of the HTB in the HEI of Dentistry. Thus, the aims of this study is to compile basic information that can guide HEI for the implementation of a HTB.

KEYWORDS: Human Teeth Bank, legislation, odontology.

1. INTRODUCTION

The Human Teeth Bank (HTB) is a nonprofit foundation, for the storage of extracted teeth, linked to an Higher Education Institutions (HEI) and/or Research Centers, related to dentistry; has as its main objective supply the academic and scientific-didactic needs, thereby eliminating the illegal trade of teeth[1].

The HTB should follow the institutional norms, with the prediction that at least one professor and at least one student to be responsible for its operation, enabling to obtain the teeth, the register of donors, storage, sterilization and the loan of donated teeth. Furthermore, HTB also aims to reduce the risk of cross-infection, preventing contamination of students, professors, clinical and environmental environments[1].

The first HTB established in Brazil, was of the School of Dentistry, University of São Paulo, in 1996[2,3], no consensus regarding the importance of the implementation of the BDHs educational institutions/ research center.

However, Pinto *et al*. (2009)[4] conducted a survey on the level of knowledge about the HTB with undergraduate students in a course in Dentistry; the study showed that 51% of respondents students received teeth Dentists and about 98% of these graduates were not aware of a HTB, a worrisome fact, considering the risk of infection and the disrespect for law.

A study conducted by Freitas *et al.* (2012)[5] shows that most academic discipline that uses human teeth is Endodontics, followed by Prosthodontics and Operative Dentistry. In the HEI with postgraduate academic discipline that asks more teeth is Endodontics followed by Dentistry and Prosthodontics. Already in scientific research 86% of HEI claimed to know the origin of teeth used. However, scientific research published in the form of a scientific paper show that there was no citation of sources of extracted teeth used. According to Costa *et al.* (2012)[6], the teeth were requested by more teachers than for students. Most teeth were most commonly used in pre-clinical practices, such as caries removal, cavity preparation, restoration and instrumentation channel.

Thus, given the heterogeneous scenario on the knowledge of the dental community about who is a HTB, this study aims to compile basic information that can guide HEI for the implementation of a HTB.

2. MATERIAL AND METHODS

For the development of this integrative review we chose the proposal of Ganong (1987)[7], according to the following steps: 1) identification of the research question, followed by a search of the descriptors or keywords; 2) determining the criteria for inclusion or exclusion of research in online databases; 3) categorization of studies, summarizing and organizing relevant information; 4) assessment of studies for critical analysis of the extracted data; 5) discussion and interpretation of the examina-

tion results, contextualizing theoretical knowledge and evaluating their applicability as; 6) presentation of the integrative review and synthesis of knowledge of each article reviewed briefly and systematic way.

In the present study the guiding question of the integrative review was: to review the literature for to compile basic information that can guide Higher Education Institutions and/ or Research Center for the implementation of a BHT.

Bases (Latin American and Caribbean Literature on Health Sciences) LILACS, SciELO (Scientific Electronic Library on Line) and PubMed (- NCBI US National Library of Medicine National Center for Biotechnology Information) were consulted. Studies that have addressed the thematic, published from 1981 to 2013, regardless of the languages of publication were included. The following controlled for the search and also used as keywords descriptors were used: Human Teeth Bank, legislation, odontology.

3. LITERATURE REVIEW

Historic

The first reported structure of a Bank of teeth emerged around 1981, when Grabrielli *et al.* (1981)[8] developed a method of collage, for anterior teeth. To put his methodology in practice, however, it was necessary to perform the selection of a tooth that could restore the condition of crown fracture, with the consequent replacement of lost tooth fragment. Thus, the selection of the tooth to be used was made by a Bank of teeth, taking back an excellent cosmetic result. However, the pioneer in the use of extracted teeth was Hayward, who gone in 1968, had practiced this technique; however, there are reports in the literature around 1600 b.C. already practiced this act. There are reports together by gold wire molars, carved ivory teeth, and even the use of teeth of sheep.

Legal support

The tooth has to be analyzed as an organ like any other organ in the body, because it is formed by different tissues and contains genetic material where they can get the DNA of the individual through his pulp.

However, only in 1997, the team of HTB of University of São Paulo got the teeth started to be considered as organs of the human body, and thus subject to what is available in Law number 9,434, (February, 4, 1997) deals with the removal of organs, tissues and body parts for transplantation and treatment. In its Chapter II of Article 6th is forbidden to post-mortem removal of organs, tissues or body parts of unidentified persons, predicting worth 2-6 years imprisonment and a fine: 100-360 fine days. Penalty of 3-8 years imprisonment and fine of 200 to 360 fine-days for people who buy or sell organs, tissues or parts the human body. In addition, worth 1-3 years imprisonment for those who violate graves[1,9].

Now, knowing that the tooth is an organ and undergoes Transplant Brazilian (Law number 9,434), in the Chapter IV - Supplementary Provisions, Article 10, proclaims: "*the transplant or graft will only express consent of the recipient, written in list only waiting, after advising on exceptionalism and the risks of the procedure*"[9]. Thus, HTB has among others, the purpose of regulating the use of teeth by academics, scientists and professors of Dentistry.

According to the Resolution of the National Health Council (NHC) number 196 (October, 10, 1996), in his section IV proclaims: "*The respect due to the dignity of free and informed consent of the subjects, individuals or groups by themselves and/ or their legal representatives expressed their agreement to participate in research*"[9]. I.e., any material used in human research must be donated and have provenance. By performing some research with human material, without knowing the origin, and without the formal consent of the donor or spouse, who is declared by completing and signing the consent form, its use is prohibited, and disapproved by the Committee Ethics in Human Research.

In this direction, there is also the legal provision of punishment for professors who may require their students to use teeth without origin; in these cases, the professor can be framed in the current legislation, the offense of incitement to crime. It is noteworthy that professors and students cannot claim innocence implied by lack of legal provisions, which provides for the use of human teeth. This is because the act committed is a crime, with frameworks Criminal and/ or Civil, and "*nobody is excused from complying with the law, claiming not to know*"[4]. According to Article 39th of Dental Ethics Code, which was released in 2006, non-compliance with legislation governing organ transplants and use the corpse to study and/ or exercise of surgical techniques is considered ethical violation, with penalties ranging from confidential warning to revocation of professional practice[10].

Conditioning of the teeth

After donated, the teeth are collected, they will be sterilized, cleaned and divided into sound teeth with amalgam in restoration, restoration in resin, supernumerary, anomalous, prosthesis, with crown and damaged root with root intact and damaged crown, with damaged and intact root crown and root fragments. Are further subdivided into incisors, canines, premolars and molars. The teeth are stored in glass jars with threadable cap, immersed in distilled water (4 °C) changed weekly[1].

The cooling of the tooth is done to preserve their physical and optical structures. Only teeth with amalgam restoration in will not be autoclaved, not to emit mercury

fumes into the environment; these teeth will be sterilized by immersion in 2% glutaraldehyde solution for 10 hours. The other teeth when requested will be sterilized in an autoclave at 121 °C, for 15 min, before your section students[1].

However, for research purposes, the teeth are preferably sterilized by autoclaving, as described. However, when no proper sterilization, interference by the methods of disinfection or sterilization can produce on the physico-chemical properties of the tooth, committing some results of the research, the investigator must sign an acknowledgment of science of the risk and use of protective equipment individual[1,10,11].

It is known that the tooth may contain pathogens with potential to survive for long time in extracted teeth and that these microorganisms are harmful to human health, disinfection of the dental organ by HTB helps control infections among users, and the community.

Maintenance of the teeth´s stock of the HTB

To achieve the teeth, demands will be made for dentists, health and even dental clinical faculty. This should happen legally, through the term of free and informed consent.

The team of HTB should invest in advertising in order to raise teeth donated by layman, a dentist and academic population. Using means such as lectures, brochures, posters, social networking, etc. Such disclosure must have as its motto as the appreciation of the tooth organ and the importance of dental element in the academic and scientific use. Thus, it becomes easier to popularize the HTB between academic and lay population, making them aware of their existence as well as of the benefits of their services.

A Socioeconomic data of donors to HTB conducted by Poleto *et al.* (2010)[12], there are several causes of tooth loss: orthodontic reasons, supernumerary teeth, included convicts, convicted of carious teeth due to periodontal pockets too deep, beyond the 3rd molars. Most donors, 58% were aged 30-49 years, 38% were men and 62% women, with varied professions. 58% of these people not previously sought dental treatment for the tooth in question.

In this case, for the donation of the former betrayed tooth occurs, the professional who did the procedure should explain to the patient that your tooth will be used for scientific research and scholarship, and its identity is preserved. After the agreement of the patient, he will sign the Instrument of Consent. During the two years of study conducted by Albuquerque Rolim *et al*. (2011)[13], between the years 2005-2007, had a total of 133 donors with most students, having donated their number of teeth ranging from 1 to 50 teeth per donor.

In the latter case, nowadays there are artificial dental arches that mimic well dentin and enamel, dental anatomy and occlusion, but the use of human dental element is of great importance to academic learning.

Operationalization of the HTB

For the loan of teeth to the students, it is recommended the preparation of a "Term of Loan" where the applicant shall sign it as well as engage with the return of the assigned teeth. In case of requests for scientific research, the researcher responsible for the project must submit your request along with the protocol for approval of the terms of use of the teeth by the Committee Ethics in Human Research that reviewed the research project previously.

We suggest that the professor or student request to HTB the amount needed for their activities with four days prior, because in some cases the tooth will still be prepared for use. Teeth returned will be assessed, and if favorable for use will be prepared for reuse and unfavorable should be incinerated[1,10]. Each record both the donation as the loan completed, will be separated by type of tooth filing and registering them[1,4,9,11].

4. CONCLUSION

The HTB still not part of many HEI, due to lack of sensitivity of academics, the lack of information of agencies that should regulate them or by lack of knowledge of the population which together result in the shortage of donations teeth.

Human teeth may be of high biological risk, especially if stored and handled incorrectly; the proper disposal of extracted teeth, this aspect is advantageous because at the same time protects the community of pathogens contributes to the training of new professionals already bring with it the notion of the importance of maintaining a HTB in a given locality.

Finally, considering the existence of legislation regulating the activities related to the use of human organs and tissues, there is the importance of the implementation of the HTB in the HEI of Dentistry. It is by treading an ethical and legal way for the use of extracted teeth for scientific research, studies and academic papers.

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