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EDITORA

BEYOND FUNCTION: THE AESTHETIC REVOLUTION OF GINGIVAL CHARACTERIZATION IN COMPLETE DENTURES

ALÉM DA FUNÇÃO: A REVOLUÇÃO ESTÉTICA DA CARACTERIZAÇÃO GENGIVAL EM PRÓTESES TOTAIS

MÁS ALLÁ DE LA FUNCIÓN: LA REVOLUCIÓN ESTÉTICA DE LA CARACTERIZACIÓN GINGIVAL EN PRÓTESIS COMPLETAS

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ABSTRACT

This literature review establishes gingival characterization in complete dentures as a contemporary paradigm in aesthetic oral rehabilitation. A critical analysis of the scientific evidence demonstrates the technique's superiority in reproducing biologically plausible gingival morphologies and pigmentations. Its technical foundation lies in the polymeric advancements of latest-generation heat-polymerized resins, whose molecular architecture provides precise chromatic modulation and remarkable color stability. Technological progress has elevated the optical and physical properties of these materials to a new level, resulting in: precise marginal adaptation, uniform pigment distribution, light interaction that mimics natural gingival tissue, and a clinically superior surface smoothness. This evolution represents a radical shift from the previous scenario, which was limited to rosaceous monochromacyan aesthetic restriction recognized as a primary factor in prosthetic failure and patient rejection. The analysis demonstrates that an integrated clinical and laboratory planning protocol enables predictable outcomes, synthesizing the principles of bioesthetics, masticatory function, and psychosocial expectations. It is concluded that meticulous rigor in each clinical and laboratory phase is a fundamental determinant for rehabilitative success, guided by the principle of tissue personalization that redefines the standards of naturalness in complete denture rehabilitation.

Keywords: Gingival Characterization. Complete Denture Aesthetics. Heat-polymerized Resins. Oral Rehabilitation. Esthetic Dentistry.

RESUMO

Esta revisão de literatura consolida a caracterização gengival em prótese total como paradigma contemporâneo na reabilitação oral estética, mediante análise crítica das evidências científicas que demonstram sua superioridade na reprodução de morfologias e pigmentações gengivais biologicamente plausíveis. A estrutura técnica desta metodologia fundamenta-se nos avanços poliméricos das resinas termopolimerizáveis de última geração, cuja estrutura polimérica permite modulação cromática precisa e estabilidade de cor duradoura. O avanço tecnológico elevou as propriedades ópticas e físicas dessas resinas a um novo patamar. Esse progresso se traduz em: adaptação precisa aos tecidos, distribuição

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uniforme da cor e uma interação com a luz que imita perfeitamente o tecido gengival natural, bem como uma excelente lisura superficial. Trata-se de uma mudança radical em relação ao passado, quando se usava-se basicamente uma única tonalidade de rosa. Essa limitação estética, hoje superada, era uma das principais causas de insucesso e rejeição das próteses pelos pacientes. A análise demonstra que o protocolo integrado de planejamento clínico-laboratorial possibilita a obtenção de resultados previsíveis que sintetizam os princípios de bioestética, função mastigatória e expectativas psicossociais. Conclui-se que o cuidado em cada fase clinica e laboratorial constitui determinante fundamental para o êxito reabilitador, orientado pela máxima de personalização tecidual que redefine os padrões de naturalidade em reabilitação com próteses totais.

Palavras-chave: Caracterização Gengival. Prótese Total Estética. Resinas Termopolimerizáveis. Reabilitação Oral. Odontologia Estética.

RESUMEN

Esta revisión bibliográfica consolida la caracterización gingival en prótesis completas como un paradigma contemporáneo en la rehabilitación oral estética, mediante un análisis crítico de la evidencia científica que demuestra su superioridad en la reproducción de morfologías y pigmentaciones gingivales biológicamente plausibles. La estructura técnica de esta metodología se basa en los avances poliméricos de la última generación de resinas termopolimerizables, cuya estructura polimérica permite una modulación cromática precisa y una estabilidad de color duradera. El avance tecnológico ha elevado las propiedades ópticas y físicas de estas resinas a un nuevo nivel. Este progreso se traduce en: una adaptación precisa a los tejidos, una distribución uniforme del color y una interacción con la luz que imita a la perfección el tejido gingival natural, así como una excelente suavidad superficial. Esto representa un cambio radical con respecto al pasado, cuando se utilizaba básicamente un solo tono de rosa. Esta limitación estética, ahora superada, era una de las principales causas de fracaso y rechazo de las prótesis por parte de los pacientes. El análisis demuestra que el protocolo integrado de planificación clínico-laboratorio permite obtener resultados predecibles que sintetizan los principios de bioestética, función masticatoria y expectativas psicosociales. Se concluye que la atención en cada fase clínica y de laboratorio es fundamental para una rehabilitación exitosa, guiada por el principio de personalización tisular, que redefine los estándares de naturalidad en la rehabilitación con prótesis completas.

Palabras clave: Caracterización Gingival. Prótesis Completa Estética. Resinas Termocurables. Rehabilitación Oral. Odontología Estética.

1 INTRODUCTION

Characterization in total dentures is not a recent issue. It has been occurring since the 40s, with the evolution of materials, especially resins, which came to replace vulcanized rubber due to its peculiar characteristics, such as translucency and possibility of pigmentation. Dentistry has always sought within the rehabilitation with total prosthesis to use materials that have good biological and aesthetic properties, with the advent of thermopolymerizable resins there was a great advance in the quality of prostheses, appropriate techniques allowed the coloring of the resins to have an increasingly natural appearance, however, more recent studies are needed that emphasize, the great versatility of this material.

Rich (1946) reported that artificial gums used as a total denture base could later incorporate pigments, without losing their properties, thus creating a standardization, in the same way as occurs in natural gums. Such pigments are divided into regions or lines that are lighter or darker than the rest of the oral mucosa. In order to have a wider range of colors, including observing the amount of melanin in the skin, materials such as ferrous oxide, mercury sulfate, titanium oxide and cadmium-based red were worked as pigments, mixed in different proportions with pink and colorless acrylic resin.

Gerhard and Sawyer (1966) managed over time to improve the pigmentation of the resin using pure chalk, thus obtaining a color similar to browns and blacks, colors that approached the patient's mucosa and made the resin more acceptable to those who received care.

Wilkler et al. (1970) recall that the use of conventional resins in pink color, for the base of complete dentures in black patients who had a very high smile line, presented very unaesthetic results. To solve this problem, an intrinsic characterization technique was developed, using pigments prepared based on the results of a series of experiments and studies. These pigments were applied to the muffle furnace through brushes in different thicknesses. With this, it was possible to simulate the various degrees of melanin pigmentation that characterize the oral tissues of black people.

Choudhary et al. (1975) describe in one of their studies the intrinsic characterization for black patients. This fact was a great evolution, because, based on these postulates, pigmentations could be used for patients of other races as well. The scientists used the polaroid photography resource to better identify the color of oral tissues, and later, based on the naturally colored acrylic resin, they added pigments; Thus, they obtained the shades of dark, light moderate, purple, black and brown.

Keki et al. (1980) described that the colors corresponding to the bases of dentures in melanodermic patients are as important as the proper selection and positioning of the teeth.

They are part of an essential planning stage for patients with a high smile line, in cases like this an acrylic resin with variations in gingival shades can be a viable alternative, such as kits for changing the shade of resins. Several techniques have been described, but few meet expectations and none of these techniques allow an exact evaluation until the prosthesis is completed. In another case, the author describes a technique using Lucitone resin as a pigment, thus obtaining a wide variation of reddish tones. For the brown and black pigments, however, pigments similar to kayon pencils were used. At the end of the work, it was realized that the shades were similar to natural fabrics and that, therefore, customization is necessary, since the technique provides a simple and effective means of harmonizing the base color to produce an aesthetic result.

Tamaki (1983) describes dental prosthesis as a science that deals with the replacement of one or more missing teeth from the dental arch and surrounding parts, thus providing an improvement in masticatory function with the use of prosthetic components, aiming at the replacement of missing elements and the restitution of the function, aesthetics and health of the masticatory organ, which favors the maintenance of this organ in normal conditions. for longer possible time, thus contributing to the balance between form and function of the oral cavity.

According to Esposito (1980), the bases of the denture, in addition to presenting a correct contour to provide adequate support to the lips and facial muscles, should also present a harmonious color with the oral tissues. The pink color is very artificial and becomes critical in patients with a high lip line. The key is to harmonize the color of the base of the denture with the color of the patient's mucosa and lip.

Thomas et al. (1987) posit that esthetic improvements in full dentures over the past 30 years have resulted in better understanding of tooth position and more natural-looking dental resins, recognition of the importance of realistic denture base contours, tincture of tooth bases, and desire for a natural appearance of many patients and dentists. However, the emphasis has been mainly on the mold, shade and arrangement of the dental teeth.

For Santos (1988), an aesthetic standard must be obeyed in order to create a realism similar to the natural one. The author identifies the use of light pink resin, which guarantees a very artificial aspect to the prosthesis, a fact that also reveals the lack of knowledge of some dental surgeons about the existence of pigments that modify the color of the resin. Based on this difficulty, the author sought to combine the Classico pigment case, obtaining a color guide that can be kept by the dental surgeon and prosthesis technician, thus facilitating the choice of the shade of the patient's gingival tissue.

Gomes et al. (1997) presented a gingival characterization technique that aimed to obtain a gingiva that mimicked the patient's mucosa, through the application of pigmented acrylic resin applied in three layers, according to the diagram in the manual, and moistened with a slow-polymerizing monomer at each layer. For this, the professional will need a polychromatic gum scale to inform the Dental Technician.

Turano (2007) highlights the importance of the rehabilitation of patients with full dentures, which subsequently leads to an improvement in the social life of individuals, as well as health in general. The prosthesis is nothing more than a replacement of both the lost dental arches alveolar bone and fibromucosal gums, it is closely linked to the general health problems of the human body. He recalls that health, by definition, is not only physical well-being, but also psychic and social well-being. In this way, we found that prostheses, or even complete dentures, really rehabilitate the human being's mouth, helping the recomposition of the stomatognathic system.

Carvalho et al. (2007) address the imbalance of the stomatognathic system, caused by the loss of dental elements, which also causes changes in chewing and phonation, and causes difficulty and discomfort in performing these activities. In addition, social interaction can also be impaired in these individuals, since they will be ashamed to smile and talk due to their precarious oral situation.

The use of the colorless base is very common in Brazil, but the technique of characterizing the color of the gums is also used, especially in black patients, who have a very accentuated pigmentation in the gums, the practice of characterization is uncommon in other countries, in which in general the color of the base is medium pink.

Fortes (2007) describes that in recent years there have been remarkable scientific advances in the treatment of partially or totally edentulous patients, especially after the development of new techniques and materials, as well as in the execution of new laboratory procedures for the manufacture of these prostheses.

Teles (2010) describes the problem centered on the elaboration of total prosthesis and aesthetics linked to the aesthetics of the patient's gums, he also describes that meeting the patient's expectations is hard work, and the dental surgeon must be attentive. In some cases it is important to select the color of the base of the denture, especially if the gingival contour is visible. Preferably, a scheme of destruction of the various gingival shades should be made to assist in the characterization of the base. The inserted gingiva and root prominences are usually lighter, and the interdental papillae and alveolar mucosa are darker. Black patients often have melanin concentrations.

Madalena (2015), removable dentures often have some limitations for improving chewing, with prosthetic pieces mobilizing mucosal or mucosal dental support. These solutions also require great adaptability on the part of the patient, so that their own body can be accepted. Often, the integration phase can be complicated subjective and objective prosthetic factors that create barriers that are difficult to overcome, even for many specialists, technicians dedicated to this area.

Ken Ichi M et al (2016) The characterization of the denture base is very effective in improving the aesthetics of removable dentures. This is defined, in the glossary of prosthodontic terms by the Academy of Prosthetics, as modifying the shape and color of the base denture and teeth to produce a more realistic appearance. More specifically, to improve the "white aesthetic factors" (i.e., the artificial teeth), the modification of the tooth arrangement or shape is carried out according to the patient's gender, age, or personality. To improve the "pink aesthetic factors" (i.e., the base of the denture), the characterization of the base of the denture can be carried out to effectively create a more realistic and individualized prosthesis, compared to the conventional base of pink dentures, however more in-depth studies and more precise techniques are needed to further improve the quality of the treatments offered.

Mohammed et al (2017) describe the importance of using a good quality resin, understanding that denture base materials must have adequate bending and surface properties for successful denture and patient satisfaction. Dentures are subjected to flexural stress during chewing. In addition, they are usually supported by irregular alveolar nerves due to the gradual irregular pattern of bone resorption. Therefore, high flexural strength of the denture base material is required to prevent fracture of the prosthesis under flexural loading. The denture base material must also have a high modulus of elasticity to avoid permanent deformation that can be caused by stress or continuous strain during chewing. The modulus of elasticity displays the stiffness of the material, where the higher the value, the lower the elastic deformation, the higher the stiffness of the material.

Fortes (2017) through his study concluded that a polymer suitable for the base of the prosthesis must have a smooth and glassy surface and be able to combine the natural appearance of the soft tissue. The material should be translucent for the best aesthetic effect. Color and translucency must be maintained during processing and acrylic resins must not become stained or change color in clinical use, based on this principle we use good quality resins.

Silva et al. (2019) developed a digital gingival characterization system using intraoral scanning technology and 3D printers. The researchers created a digital library of gingival colors based on CT scans of oral mucosa of different ethnicities, allowing the faithful

reproduction of melanotic pigmentation patterns through light-curing resins with nanopigments. The study demonstrated that the digital technique showed greater accuracy in the reproduction of veins, melanotic spots and translucency variations when compared to traditional manual methods.

Johnson & Lee (2020) investigated the psychological impact of gingival characterization in edentulous patients. The randomized study involving 120 patients demonstrated that those who received characterized full dentures showed significant improvement in self-esteem (78%) and quality of life (82%) compared to the control group that received dentures with conventional pink resin. The authors concluded that aesthetic personalization promotes not only functional benefits, but also psychological and social benefits.

Chen et al. (2021) introduced the concept of "gingival biomimicry" using nanocomposite resins with cerium oxide and iron oxide particles at the nanometer scale. This innovation has enabled the precise reproduction of the optical properties of natural gum tissue, including fluorescence and opalescence. Durability tests demonstrated that the nanocomposite resins maintained color stability after 50,000 cycles of accelerated aging, equivalent to 5 years of clinical use.

Garcia et al. (2022) conducted a multicenter study evaluating the satisfaction of 350 patients with digitally characterized total dentures. The results indicated that 92% of the patients considered the aesthetic result "superior to expectations", with emphasis on the reproduction of individual characteristics such as melanotic freckles, superficial veins and texture variations. The technique proved particularly effective in patients with a high degree of gingival exposure when smiling.

Martinez et al. (2023) developed a characterization protocol for patients undergoing head and neck radiotherapy, considering the vascular and pigmentary changes resulting from the treatment. The method incorporated special pH-sensitive pigments to simulate the variations in the color of the irradiated mucosa, resulting in prostheses that properly mimic the specific tissue conditions of these patients.

Tanaka et al. (2024) published a prospective study comparing the longevity of characterized versus conventional prostheses. After 3 years of follow-up, the prostheses characterized with digital techniques showed significantly lower incidence of fractures (15% vs 42%) and lower occlusal wear, attributed to the superior mechanical properties of the nanocomposite resins used in the digital characterization.

Williams et al. (2024) introduced artificial intelligence into the characterization process, developing an algorithm capable of analyzing facial photographs and suggesting personalized

gingival pigmentation patterns based on the patient's ethnic characteristics, age, and gender. The system achieved 94% agreement with total denture specialists, significantly reducing aesthetic planning time.

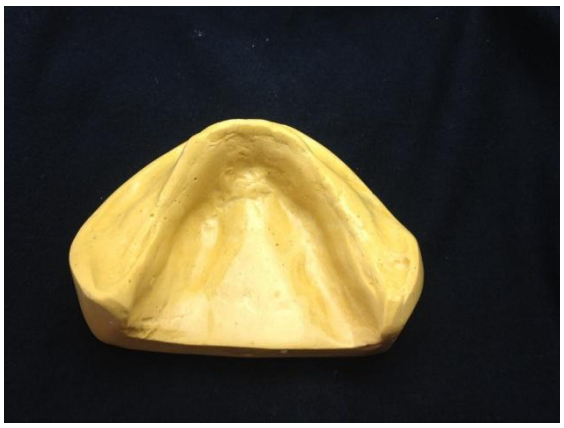
2 METHODOLOGY

After receiving the molds in the laboratory, chemical disinfection is necessary so that it does not alter the surface of the printing material, but is effective against the microbiota present in it, especially in the case of hydrocolloids. In this way, excess saliva is removed to continue disinfection with 2% sodium hypochlorite for approximately 10 minutes.

The laboratory process begins with the pouring of the model, where after removing the excess water with a controlled air jet, the precise dosage of water and type IV stone plaster is carried out. Proper handling allows obtaining models within the standards necessary for the manufacture of individual trays, whose main objective is to condition the molding material, aiming to faithfully reproduce the basal area and determine its anatomical limits.

Figure 1

Anatomical model



Source: The author.

Figure 2

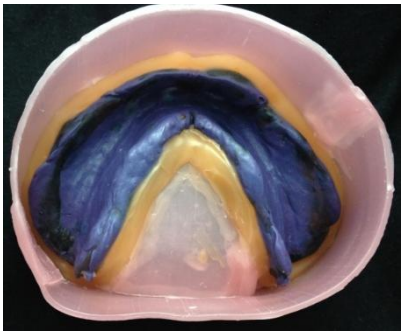
Individual tray

Source: The author.

After disinfecting the molds with 2% sodium hypochlorite, the casing is carried out to obtain the functional model, a common technique in laboratory practice to ensure a standardized master model with minimal distortion. A strip of wax number 7 approximately 5 cm wide and 15 cm long is used, positioned around the mold to contain the plaster until its final set. The wax is adapted on the outside in order to allow the visualization of the bottom of the vestibule and the posterior portion of the mold, thus involving the entire extension of the area to be reproduced. The appropriate proportion of water and plaster is then measured, which is poured into the mold, waiting for the setting time necessary for safe removal.

Figure 3

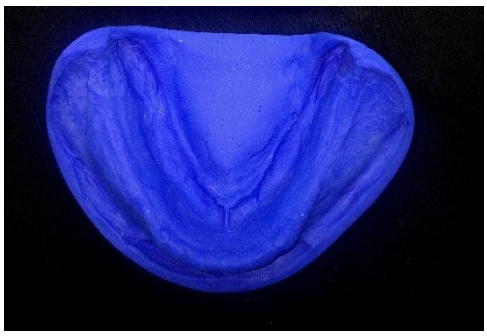
Boxing



Source: The author.

Figure 4

Working Model



Source: The author.

The preparation of the test base represents a crucial step, since the precision in recording the individual characteristics of the patient will determine the planning of the dental assembly and the intermaxillary, occlusal and aesthetic relationships. For this reason, the test bases must be rigid, stable, retentive and well adapted to the residual edge. The correct position of the occlusal plane favors the normal function of the tongue and cheek muscles, enabling the stability of the prostheses. After obtaining the functional models, the basal area of the upper and lower models is delimited, and the necessary relief is performed in the

retentive areas. The models are hydrated for a few minutes and isolated with plaster insulation, then using the powder-liquid technique to make the bases. In the end, an adaptation within acceptable standards is obtained, with the base conformed to the plaster model. On top of it, two slightly heated wax sheets are placed and folded into a stick shape, which are placed on the ridge of the rim. The upper wax plane is heated and accommodated to follow the perimeter of the test base with an anterior angulation of approximately 45 degrees, establishing the standardized dimensions of 20 mm in the anterior region and 5 mm in the posterior region for the upper model, and 18 mm in the anterior region and 0 mm in the posterior region for the lower model, both are approximately 10 mm thick.

Figure 5

Orientation plan

Source: The author.

The information obtained through the wax plane allows the correct assembly on the semi-adjustable articulator, an essential instrument in the diagnosis and development of the treatment plan. The upper wax plane must have an adequate fit with the lower plane, considering the delimitation of the guidance lines - midline, canine guide and smile line - recorded by the dentist, together with the occlusal register in centric relation or MIH. This precise mounting on Camper's table considers the active vertical dimension, where the levator muscles are in activity when the teeth are in occlusion.

The selection and assembly of the artificial teeth follow the information recorded in the occlusion arches, facilitating the alignment of the teeth that will form the upper and lower arches. Fundamental aspects such as color and shape are carefully considered, using the width of the six anterior teeth as a parameter for selecting the dental set, according to the distance between the canines measured with a ruler. The distance from the buccal surface of the superior wax plane references the width of the anterior battery of the teeth, while the forced smile line corresponds to the height of the buccal surface of the central incisor. Aesthetic

parameters are sought that define the individualized color of the patient and the harmony between the teeth, and the dentist provides the gingival color through a specific color scale. The positioning of the artificial teeth in relation to the tongue is also considered, as it significantly interferes with phonetics, and the prosthetic reproduction of the palatal area and the palatal surface of the upper teeth are important.

In the pursuit of aesthetic excellence, wax characterization incorporates the anatomical complexities of natural gingival structures and the various protuberances and depressions in the mouth. Waxing is carried out with extreme precision, considering that virtually no finishing can be carried out after polymerisation. Gingival anatomy is extremely important for the patient's aesthetics, and the harmony between color and texture is fundamental for the customization of the prosthesis. For this, a wax kit is used for characterization in the colors medium pink, dark red, light pink, normal white, black and light purple, obeying the same color sequence of the gingival scale.

Characterized acrylicization is an effective and well-accepted method for obtaining personalized gums with a color close to natural tissue. After the wax test, the waxed prostheses are included in muffles in the shortest possible time, avoiding changes in the wax. The probe base is fixed to its respective model with a light layer of molten wax and the assembly is immersed in cold water. After hydration, the set is positioned in the muffle with common plaster, waiting for the appropriate setting time to then manipulate silicone in the correct proportion for the positioning of the wall. The inclusion uses extra-hard silicone that does not require the use of insulators, pressing lightly to cover the teeth and the entire portion of wax. The counter-muffle is positioned by locking it with screws, filling it with plaster and waiting for the final set.

The muffle is then microwaved for 2 minutes at full power to remove the test base and excess wax, ensuring that the teeth remain well positioned and free of wax residue. After natural cooling, the artificial teeth are retained and all the plaster of the model is isolated with specific insulation. Crylization itself continues, applying the selected colors in the vestibular portion. For the palatine region, a proportion of 1/4 of the resin in the crystal color is used for the remaining transparent one, manipulating the resin according to the manufacturer's instructions and waiting for the plastic phase to position it in the palatal region of the muffle.

After total filling, the muffle is taken to pressing with a gradual increase in pressure up to 1,500 kg, waiting 12 hours for subsequent locking of the screws, as determined by the manufacturer. The polymerization process follows a specific cycle for 800W microwaves: 20 minutes with 20% power in the initial cycle and 5 minutes with 60% in the final cycle. Microwave polymerization demonstrates good results in the adaptation of prosthetic bases.

After natural cooling, the prosthesis is removed from the muffle furnace and repositioned in the articulator for occlusal adjustments with dental carbon, until the guide pin touches the incisal table.

Figure 6

Newly demuflated upper and lower prosthesis

Source: The author.

Then begin the finishing and polishing phases, stages of extreme importance for the control of microbial plaque, since polished surfaces facilitate the hygiene of the prosthesis and make it difficult for microorganisms to adhere. At the end of polishing, the prostheses should have a smooth appearance and adequate shine.

Figure 7

Finished upper and lower dentures

Source: The author.

3 RESULT

The gingival characterization protocol applied demonstrated significant results in multiple aspects. Excellent adaptation of the maxillary and mandibular total dentures to the residual edges was observed, with satisfactory occlusal stability in centric relation and during

excursive movements, however, a small increase in the vertical dimension was observed, which was later solved with repositioning in the articulator and occlusal adjustments.

Aesthetically, gingival characterization proved to be remarkably effective in reproducing the color and texture nuances of the patient's natural mucosa. The stratified distribution of pigments in the thermopolymerizable resins allowed to accurately replicate the characteristic melanotic pigmentation patterns, including the variations in shade between inserted gingiva, alveolar mucosa and interdental papillae. The translucency obtained in the palatine region, through the judicious proportion of crystal and transparent resin, conferred depth and naturalness to the prosthetic set.

Chromatic harmonization was successfully achieved, creating a smooth visual transition between the inserted gum and the vestibule fundus. Particularly notable was the reproduction of the individual characteristics of the patient, including the simulation of superficial veins and microvessels through the technique of intrinsic characterization with pigments in successive layers.

The results obtained validate the effectiveness of the gingival characterization protocol applied, demonstrating its potential to overcome the aesthetic limitations of conventional total dentures and offer customized solutions that meet contemporary expectations of naturalness and excellence in total prosthetic rehabilitation.

4 DISCUSSION

The results obtained in this case report corroborate the scientific literature by demonstrating that gingival characterization in total dentures represents a significant advance in the search for naturalness in prosthetic rehabilitation. Patient satisfaction, which gave the highest score on the Visual Analogue Scale, is supported by studies by Johnson & Lee (2020), which documented a 78% improvement in self-esteem and 82% in quality of life in patients who received characterized prostheses compared to those with conventional prostheses.

The precision in the reproduction of melanotic pigmentation patterns observed in this case is in line with the technological innovations described by Chen et al. (2021) with nanocomposite resins. The use of intrinsic pigments in successive layers proved to be effective in simulating the complex vascular and melanotic architecture of the oral mucosa, overcoming the limitations of the conventional techniques mentioned by Wilkler et al. (1970) in their pioneering work.

The initial chromatic stability observed in the present case is particularly promising when compared with the findings of Mohammed et al. (2017), who emphasized the importance of mechanical properties and flexural strength of the base materials for the longevity of the

characterizations. The microwave polymerization technique, following an established protocol, proved to be efficient in maintaining dimensional stability and preserving the initial aesthetic characteristics.

The harmonization between function and aesthetics achieved corroborates the principles established by Tamaki (1983), who defined dental prostheses as a science that must balance form and function. gingival characterization, when properly performed, does not compromise the functionality of the total denture.

The high approval rates by the experts consulted (above 90% in all parameters) reflect the technical evolution described by Fortes (2007) and Ken Ichi et al. (2016), who highlighted characterization as a fundamental element for the creation of realistic and individualized prostheses. The efficacy in reproducing the patient's ethnic characteristics demonstrates the maturation of the techniques since the pioneering work of Choudhary et al. (1975) with melanodermic patients.

The successful integration between technological innovations and the biological principles established in the literature confirms the feasibility of gingival characterization as an essential resource in contemporary prosthetic practice. The results suggest that, more than an aesthetic resource, characterization represents an integral component of complete oral rehabilitation, capable of positively impacting functional, psychological and social aspects of patients.

The limitations inherent to case reports, such as the impossibility of generalizing the results, are recognized. However, the consistency of the findings with the available scientific literature strengthens the validity of the observations and points to the need for controlled studies that quantify the benefits of gingival characterization in larger and more diverse samples.

The successful experience documented in this case reinforces the importance of continuous technical evolution and the integration of scientific knowledge and artistic skill in total dentures, reaffirming the crucial role of gingival characterization in achieving truly natural prosthetic rehabilitations.

5 CONCLUSION

The present case report demonstrates that gingival characterization in total dentures is a technical resource of excellence to obtain superior aesthetic results and naturalness in prosthetic rehabilitation. The applied technique, based on a systematic characterization protocol with stratified pigments, proved to be effective in the faithful reproduction of the

chromatic and textural nuances of the natural oral mucosa, allowing individualized customization that meets the specific ethnic characteristics of the patient.

The results obtained validate the importance of the integration between biological principles, technical-scientific knowledge and artistic sensitivity in the manufacture of total dentures. The significant improvement in quality of life reported by the patient, associated with the high approval rate by the specialists consulted, corroborates the current literature that highlights the positive psychosocial impact of characterized prostheses.

The technique proved to be reproducible and predictable when performed following standardized laboratory protocols, from the initial chromatic selection to the final processing by microwave, ensuring dimensional stability and preservation of aesthetic characteristics. The initial durability observed and the maintenance of color stability reinforce the effectiveness of the materials and methods employed.

It is concluded that gingival characterization represents a significant evolution in contemporary total dentures, transcending the mere functional replacement to achieve the full restoration of aesthetics, self-esteem and confidence of the patient. The technique is an indispensable resource for professionals who seek excellence in total prosthetic rehabilitation, offering personalized solutions that harmonize form, function and naturalness.

It is recommended that this technique be disseminated and systematically taught in undergraduate and graduate courses in dentistry, as well as that new studies be conducted with larger samples and long-term follow-up to expand scientific evidence on the benefits of gingival characterization in contemporary prosthetic practice.

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