THE PLURIFACTORIAL APPROACH TO DENTO-SOMATO-FACIAL DISHARMONY AT THE CONFLUENCE OF NEW BIOMATERIALS, TECHNIQUES AND TECHNOLOGIES

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Abstract: The impact of aesthetic disharmonies on the balance of the stomatognathic system is an eloquent plea for the implementation of well-conducted prophylactic methods, with the elimination of etiopathogenic factors correlate with iatrogenicity, the type of biomaterial used, the technological approach, without avoiding the archetypes characterized by the specifics of the general binominal state-oral pathology . Considering the complexity and variety of the pathology generated by the dento - somato -facial disharmony, the study aimed to individualize an aesthetic evaluation algorithm, quantifying the installed complications and the present restorative treatments in triggering the area of signs and symptoms of this clinical entity with profound implications on the oral balance. After analyzing the parameters related to the units odontal and the relationships that are established between them at the level of the dental arches, between these lips and the main lines of the face, we will proceed to the analysis of the gingival festoon. The cases in which restoration of the dento-periodontal aesthetic balance can be achieved exclusively through a single treatment method are relatively few in number.

Key words: disharmonies, aesthetic demands, aesthetics dento-somato-facial, stomatognathic system

Introduction

Today, modern dentistry has a multitude of methods to restore the dento - somato -facial aesthetic balance, the evolution of techniques and materials in recent decades being absolutely spectacular[1].

To the same extent, today's patient has increased expectations, he has demands that must be met and that require the application of a complex of techniques to be satisfied.

Thus, for example, the realization of all-ceramic restorations in the anterior area, which manage to reproduce in excellent conditions the illusion of the natural, could be compromised by other factors that alter the dental and facial composition, such as exaggerated gingival exposure, malpositions of neighboring teeth or size antagonists their improper coronaries. The therapeutic complexity of the approach to the patient with aesthetic disharmony resides in a plurivalent factorial cumulation and the etiopathogenic individualization of each side, corroborated with the particularity of each clinical case, constitutes a targeted therapeutic approach[2].

Aesthetics dento-somato-facial represents a complex territory, permanently evolution in accordance with standards and requirements of the governing epoch respectively. Identification prevalence and incidence disharmonies aesthetics in the dento-periodontal area in a therapeutic priority with deep implications on the patient 's social insertion[3].

The impact of aesthetic disharmonies on the balance of the stomatognathic system is an eloquent plea for the implementation of well-conducted prophylactic methods, with the elimination of etiopathogenic factors correlate with iatrogenicity, the type of biomaterial used, the technological approach, without avoiding the archetypes characterized by the specifics of the general binominal state-oral pathology. The choice of the therapeutic solution of choice for the category of patients addressed to, correlated with the therapeutic management, constitute two central ideas that govern the conducted studies. Every kind of disharmony aesthetics in the dento-periodontal area has characteristics specific to the therapeutic approaches conducted according to an algorithm therapeutic individualized[4].

The practical activity in the field of dental medicine provides a clear picture of the increased frequency of dento - somato - facial disharmony, each age range brings together clinical cases, which oscillate between the anatomical restoration of fidelity and the various degrees of abdication from it, a situation that attracts manifestations at the level of the dento - periodontal and muco - bone support, with an echo on the dyshomeostasis of the stomatognathic system[5,6,7] .

The wide range of therapeutic solutions addressed in dental prosthetics acquires individual values for patients with aesthetic disharmony, the final therapeutic solution being the result of correlating the assessment of the general condition and oral pathology, with the details of the prosthetic field, an essential role returning to the therapeutic variants dependent on the biomaterials used and the technological line used, all these aspects being under the sign of anatomical-functional specificity in the analyzed group of patients[8,9,10]. The objective of practical aspects within a group of patients, the establishment of correlations between the clinical entity and the causal factor, accompanied by eloquent examples, highlights the practical possibilities, anchored in the territory of current dental medicine, to solve the clinical situations encountered.

The purpose of the study

Considering the complexity and variety of the pathology generated by the dento - somato -facial disharmony, the study aimed to individualize an aesthetic evaluation algorithm, quantifying the installed complications and the present restorative treatments in triggering the area of signs and symptoms of this clinical entity with profound implications on the oral balance.

Material and method

For this purpose, we evaluated a group of 123 patients, 65 women and 58 men, aged between 18 and 65 who presented themselves in the Dental Prosthetics Clinic during 2019-2022, distribution patients by age group was as follows figure 1(Fig.1).

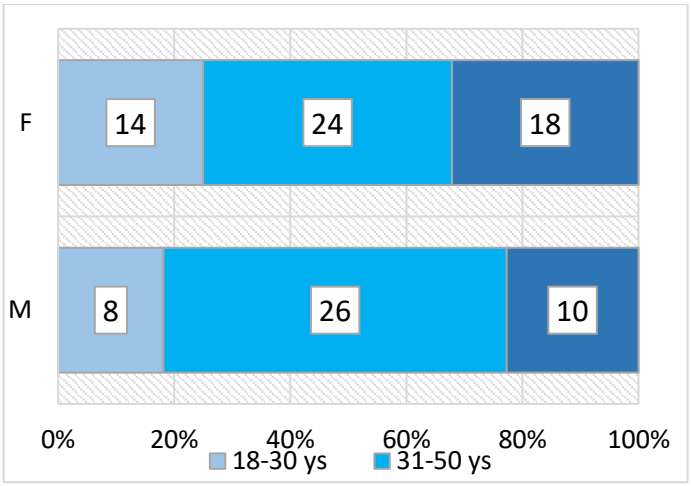

Fig.1 Structure of the study group

The patients were subjected to a clinical and paraclinical examination according to the algorithm used in the clinic, with special emphasis on investigating the parameters of the dento - somato -facial aesthetic balance.

Very often, the therapeutic approach to restoring the aesthetic balance involves treatments to clean up the oral cavity (surgical treatments, periodontal treatments aimed at restoring periodontal health, endodontic treatments .

Following this investigation, the need for treatments at the level of the analyzed study group was as follows (*Fig.2*):

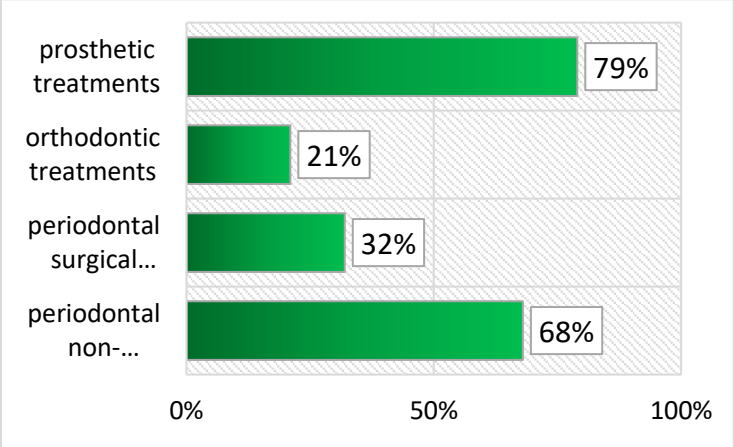

Fig. 2 Aspects of need for treatments

The idea from which this study started was that sometimes, if the sequencing of the treatment plan considers the restoration of the biological conditions, then the restoration of the altered structures followed by the restoration of the functions, the aesthetic function being the last to be taken into consideration, then the aesthetic result is often compromised.

As a result, we suggest in this chapter a reverse approach, without ignoring any of the aspects that a treatment plan must follow. We are just suggesting an approach from a different perspective.

Results and discussions

As a result, the clinical evaluation had as its starting point the evaluation of the parameters of the dento-somato- facial aesthetic balance.The first parameter investigated was *the position of the maxillary central incisors in relation to the upper lip* (*fig3*)

Fig.3 The position of the maxillary central incisors in relation to the upper lip

The evaluation is carried out when the patient is in a posture relationship. With the help of a periodontal probe, we evaluated the distance between the incisal edge of the upper maxillary incisors and the upper lip. This distance varies depending on the age of the patient.

In our study group, 31% of patients between the ages of 18 and 50 had an exposure of less than 2 mm, whereas it is normally around 3 mm in young people and around 1 mm in the elderly (due to abrasion phenomena on the one hand and changes in muscle tone of the lips on the other) .In these cases, it is necessary to institute measures to lengthen the crowns of the maxillary central incisors through: prosthetic restorations, orthodontic extrusion. The selection of the optimal treatment method will depend on the existing proportions of the patient's face, the coronal length of the maxillary incisors and the type of occlusion.

In 9,5% of the cases there was an exaggerated exposure of the surface of the maxillary incisors. In such situations, depending on the severity of the defect, modeling ameloplasty, prosthetic restorations, orthodontic intuition can be used and in this case the therapeutic decision is made depending on the facial proportions and the type of occlusion (*Fig.4*).

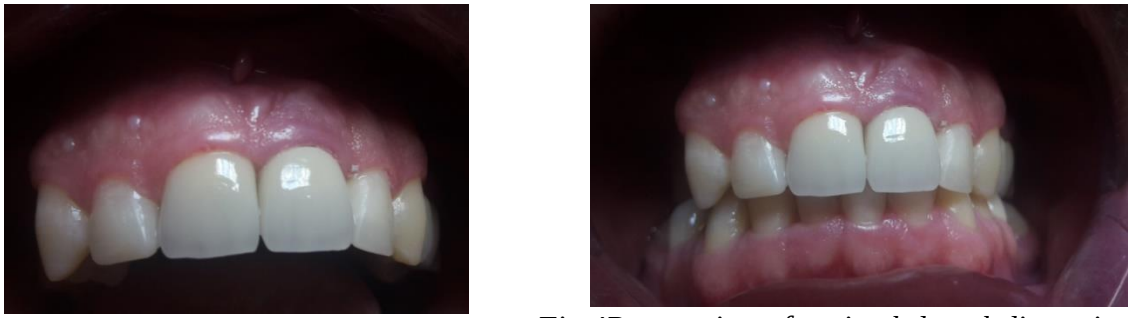

Fig.4Restoration of optimal dental dimensions at the level of the anterior arches

The correction of the divergent disposition of the interdental line relative to the median line can be achieved by orthodontic methods or by prosthetic restorations, the therapeutic decision being decisively influenced by the health status of the central incisors.

After the correction indications of the interincisal line and the degree of exposure of the vestibular surfaces of the maxillary incisors have been established (thus their correct orientation vertically and transversely), their arrangement in the labio -vestibular sense is analyzed.To evaluate this parameter in orthodontics, cephalometric measurements are used.

Another method is to analyze the position of the maxillary central incisors relative to the occlusion plane.

Normally, their vestibular surface should be perpendicular to the plane of occlusion, which makes the incident light reflect in a maximum amount, with an optimal aesthetic effect. If the upper central incisors are retroclined or proclined, then orthodontic or prosthetic interventions are necessary, which may require devitalization of the teeth in question in order to correct their sagittal disposition.

We detected abnormalities of the longitudinal insertion axis of the maxillary central incisors in 49% of the patients.

Another parameter that must be investigated is the level of the occlusion plane in the posterior region relative to the optimal level of the incisal edges.

Their position will be established depending on the need to restore their relationships with the lower lip when the patient smiles (smile line). If the patient presents abnormalities of the lower lip (asymmetries, scars), the bipupillary line will be used as a reference plan.

After analyzing the parameters related to the units odontal and the relationships that are established between them at the level of the dental arches, between these lips and the main lines of the face, we will proceed to the analysis of the gingival festoon.

The key aspect that must be taken into account when analyzing the level of the gingival festoon is the establishment of correct dimensions of the dental crowns relative to the optimal position of the edges incisals (Fig. *4*).

Fig.4 Investigating the level of the gingival festoon in relation to the dimensions of the dental units and the optimal aesthetic position of the incisal edges of the teeth of the maxillary and mandibular anterior group

It should be emphasized that the level of the gingival festoon will be established in such a way as to restore the correct proportions at the dental level, to ensure an optimal gingival exposure during the smile and to restore symmetry at the level of the dental arches.

If the existing level of the gum generates teeth with insufficient length compared to the optimal level of the incisal edges of the maxillary incisors, then it must be moved apically through periodontal surgery interventions addressed only to the gum or both the gum and the alveolar bone, through orthodontic intrusion interventions or through intrusion orthodontics and subsequent prosthetic restorations.

For optimal treatment, the following parameters must be analyzed : position the junction amelo -cementation reported at the level of the alveolar bone crest, the depth of the gingival sulcus, the tooth dimensions, the root-crown ratio, the shape of the root.

Gingivectomy is a simple and quick technique with the greatest indications in the case of gingival hyperplasia where access to the alveolar bone is not necessary during surgery. It is also indicated in the case of the existence of a large area of keratinized gingival tissue.

Flap surgery is indicated in the case of areas where access and contouring of the alveolar bone is necessary and in areas with limited keratinized gingival tissue . Although it is a more demanding technique, healing after flap surgery is more comfortable for the patient, and post-operative bleeding occurs less often. After the flap operation, the patient can resume oral hygiene earlier due to the primary closure of the surgical incision.

An essential therapeutic objective is the long-term stability of the therapeutic result. The latter presupposes respect for integrity junction dento -gingival and any odontal restoration must be in harmony with the adjacent periodontium. A predictable therapeutic success requires not only a complete and accurate diagnosis but also the development of an appropriate therapeutic plan[11,12,13].

After formulating a complete and accurate diagnosis, the treatment plan is developed. Thus, the muco - gingival therapy must ensure an increase in the apico -coronal and vestibulo - oral dimensions of the gingival tissues and to establish an adequate depth of the vestibule where necessary.

The attached gingiva must have sufficient volume and integrity to ensure an adequate epithelial seal. When procedures are instituted for root coverage, the muco - gingival procedures must additionally ensure the coverage of the previously exposed root surface up to the level of the junction amelo -cementation and thus include the biological attachment between the grafted tissue and the root surface, respectively to ensure a future sulcus with a biological depth.All these considerations have a guiding role because every time it must be taken into account that each patient is an individual and that the balance with the remaining teeth must also be restored.

Restoring odonto -periodontal contours is another approach aimed at restoring the dento - somato - facial aesthetic balance. The contour of each individual tooth will respect the contour of the natural teeth and the emergence profile of the pole teeth, a fact that presupposes a sufficient and correct preparation of the organic substructures[14,15,16] .

Restoring the harmony of this parameter will lead to the correct restoration of the outline of the dental arches, with an impact on the entire facial composition .

Restoring the *proportions and dimensions* is an essential principle for the aesthetic rebalancing of the odontal units. Each restored tooth must observe the dimensions of the natural teeth, in full harmony with the teeth remaining .

Any alteration of the normal dimensions of the teeth of the maxillary frontal group, which are the most exposed to direct vision, must be corrected, possibly through interventions on the gingival festoon, so as to obtain the expected aesthetic result. Provisional dentures become absolutely indispensable in these cases.

Another situation in which interventions must be made to correct dental proportions and dimensions is that which occurs after periodontal surgery interventions.

After periodontal restoration, despite the efforts to preserve as much as possible the level of the marginal periodontium, very long dental crowns may result (Fig. 5). The application at this level of gnathoprosthetic devices that exactly respect the lengths of these teeth can lead to the realization of extremely unaesthetic prosthetic reconstructions. In these cases, it is necessary to call on the talent of the dental technician who, through chromatic fireworks or with the help of pink ceramics, can hide this defect.

Fig.5 Periodontal treatment with modification of the proportions and dimensions of the units odonto -periodontal

Spaces will not be attempted interdentation with ceramic material because this fact involves altering the emergence profile of the teeth on which the gnathoprosthetic appliance is applied and may be followed by periodontal recession.

Odontal color restoration by means of metal - ceramic means is one of the more complicated and finer steps in the therapy by means of prosthetic means .

Presupposes compliance with a series of general conditions for color registration (correct lighting of the office and the operating field, ensuring some teeth moistened with saliva, etc.) as well as a very good knowledge on the part of the dentist of the characteristics of the colors and the particularities of the teeth from this point of view: translucent, inhomogeneous structures, very large color variety, fluorescence, changes imposed by age.

It will be taken into account that not all the teeth have the same color, the central incisors are brighter, and the canines are more saturated in shade[17,18,19].

Another very important aspect is related to the fact that different chromatic fireworks can be used to generate various optical illusions, to suggest different details at the odontal level unit.

After establishing the optimal aesthetico-odontal tic from the patient's perspective, the correlations with the clinical situation will be made and the therapeutic possibilities and limits will be established[20,21,22,23].

The same principles will be followed in restoring the aesthetic balance at the dento -periodontal level and in the case of the mandibular arch[24,25,26,27,28].

Once the maxillary and mandibular occlusal planes are established through the prism of restoring the dento - somato -facial aesthetic balance, the restoration of correct and balanced intermaxillary ratios, which do not generate imbalances at the muscular and joint level and which allow the exercise of functions in optimal conditions, will be considered.

Conclusions

The cases in which restoration of the dento-periodontal aesthetic balance can be achieved exclusively through a single treatment method are relatively few in number.

In the vast majority of clinical situations, in order to obtain optimal results from an aesthetic point of view, complex treatments are required that involve both

periodontal surgery and prosthetic and orthodontic interventions.

The judicious association of treatment methods and the establishment of their correct indications must have as their starting point a thorough clinical examination in which aesthetic imbalances are the central point without omitting biological, structural and functional considerations. As a result, the clinical algorithm must be complex and meticulously conducted.

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