ORAL REHABILITATION IN GERIATRIC PATIENTS. A CASE PRESENTATION

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Abstract

When senescence gets installed in the organism, it induces involution of the stomatognate system, the modifications produced at this level influencing directly the life style of the old person and his/her social relations, so that the old one will resort to a therapy assuring, at least partially, the lost structures and functions. Prosthetic rehabilitation in old people should aim at preserving the existing dental structures, by providing an optimum dental-periodontal support for subsequent prosthetic works, adapted to the clinical situation and to the socio-economical requirements, as well.

Keywords: elderly people, prosthetic treatment.

1. INTRODUCTION

Aging induces biological insufficiency, so that, quite naturally, some of the modifications related to growing old processes are themselves manifested as a disease. In this respect, old people show morbidity characteristics different from those of the young ones. Old people fall more frequently ill, their diseases are longer, with a manifest chronicization tendency [1].

Having all these in view, elaboration of the treatment plan should consider the biological condition of the patient, his general and local status, his psychic stability, and also his socio-economic context [2].

By specific treatments, the stomatologist helps his patients to further exercise their attributions and to continue their activities in family and society. The variability of the stomatological interventions is conditioned by both patients’ requirements – determined by acute or chronic sufferings, by masticatory, physiognomic and phonetic disorders, and by the characteristics of the prosthetic field and the technical-material conditions assured in the dental office and in the laboratory of dental technique [3, 4].

2. MATERIALS AND METHODS

The study was performed on a group of 55 patients (29 women and 26 men) with ages between 65-87 years, during 2014-2016.

Each old person was subjected to a general geriatric evaluation, followed by a minute stomatological examination, associated with specialized paraclinical exams, which permitted a biological conclusion and, subsequent establishment of the diagnosis and of the necessary therapeutical solutions.

Clinical evaluation was mainly based on the information obtained from anamnesis, which oriented the examinations to follow. Even if gathering of information is longer in the case of old people, a good documentation and knowledge of the problems an old patient may face facilitate an efficient clinical examination and application of corresponding stomatological treatments.

Quantification of personal antecedents permitted a general estimation of the stomatological diseases of patients, for evaluating the risks of certain therapeutical manoeuvres and for collaborating with physicians of different
specialties for the application of the most suitable treatments to their old patients [3].

Considering the subordination of the stomatognate system to the organism, in general, geriatric evaluation also included a brief physical examination, and registering of vital signs. Orofacial examination assumed both an extraoral, front and profile exam, and an intraoral one, which put into evidence the following types of edentations: total, subtotal and partial (reduced and extended) edentation.

3. RESULTS AND DISCUSSION

Analysis of the structure of the experimental group was conducted accordong to the methodology in force for attaining the scope and objectives of the investigation.

Structure of the group according to sex
Out of the 55 patients of the experimental group, 29 (52.72%) were women, and 26 (47.27%) - men. Distribution of patients according to sex evidences a higher ratio of female subjects (Fig. 1).

3.3. Ages categories for the experimental group

The experimental group included patients with ages between 65 and 87 years. In geriatry, the categories of age are: 65-74, 75-84 and over 85 years (Fig.2). One may observe that most of the patients belong to the «young old ones» category - 65-74 years (45.45%); the 75-84 year category («mature old ones») represents 38.18% of the group and those older than 85 years («the longevive ones») represent 18.18%.

Structure on social (residence) media
The patients who addressed for specialized examination came mainly from urban areas, respectively, out of the total number of 55 patients of the experimental group, 32 (58.18%) were from the urban area, while 23 (41.81%) from the rural one; the urban/rural ratio is therefore of 1.39 (Fig. 3).

As generally known, the social factors influence the relation between oral health and life quality, namely individual well-being. At the same time, mention should be made of the fact that the medium of origin may represent a risk factor for oral diseases, the rural area being frequently associated with a reduced access to the existing system of primary care.

Education level
In relation with patients’ distribution according to their education level, one should observe the preponderence of patients without academic training, namely with only a medium and low instruction level (Fig. 4).
The inequalities manifested in the health condition of the population among the old ones and the rest of adult persons are also caused by the different economic and education levels registered in the subjects.

Motives of presentation

Among the numerous problems that made the old ones address the Clinic of Dental Prosthetics, the most important were:
- functional disorders (masticatory, physiognomic, phonatory)
- repairings and reconditionings of the existing prostheses
- replacement of prostheses
- suffering and complications at abutement teeth or in the neighbouring tissues
- consultation during hospitalization.

In most of the cases, patients complained of functional disorders, requiring new prosthetic treatments. Unfortunately, part of the old patients (10.9 %) did not came to the periodical control during hospitalization.

Analysis of the incidence of tabacosis in the experimental group was justified by the high number of diseases related to smoking. Thus, 30.9% of the patients are smokers, yet none of them exceeds a number of 10-12 cigars/day.

Apart from the negative effects upon the heart and lungs, tobacco consumption is an important risk factor in the development of diseases in the oral cavity, smoking appearing as a major risk factor favoring the installation of periodontal diseases, once known that nicotine reduces the blood flow at gingival level.

The range of oral affections associated to smoking includes, apart from the periodontal disease ans nicotinic stomatite, leucoplasia, gingival retraction with periodontal attachment loss, ulceronecrotic gingivitis, hyperplastic chronic candidosis, rhomboid median glossite, hairy tongue, plane liquen, oral halene, dental caries, tooth loss and installation of various types of edentation.

Physiological decline and association of chronic diseases may contribute to a significant decrease of the therapeutic response and of the safety limit of the utilized drugs. Most of the chronic diseases present in old people and the treatments followed to attenuate them may affect oral health. There exists the unanimously accepted idea that the oral health condition reflects the general health status. Old patients with a precarious general condition are more exposed to various oral diseases.

Thus, the assertion may be made that the systemic pathology of an old person influences oral pathology by modification of the local structure. Interaction of the involutive physiological modifications with the associated general diseases, against the background of a decreasing compensating function of the organism, requires a complex, integrated approach of the old patient. Nor should one subestimate the involvement of the local factors (a correct conception and realization of the fixed and mobile prosthetic works, a strict observance of the clinical-technological algorithm recommended, exclusive utilization of biocompatible materials) acting upon the components of the stomatognate system with low reactivity (teeth, periodontium, mucous membrane, bone), and inducing some specific forms of oral pathology.

The general diseases identified in the subjects of the experimental group were: cardiovascular affections, type 2 mellitus diabetes, rheumatismal sufferings, sight disorders, osteoporosis, ENT diseases, dermatological problems, Parkinson, AVC (Fig. 5).

The observation made was that only 25.45% of the patients do not suffer from systemic affections. Most of the subjects have a general condition affected by a large number of diseases with systemic localization. Special attention was given to cardiovascular diseases (arterial hypertension, ischemic coronary diseases, cardiac arhythmies), as the patients suffering...
from them are the most numerous in the group (49.09%). At the same time, cardiovascular diseases represent the main cause of death in old people. Hypertension is the main risk factor for the old one, as the incidence of cerebral and coronarian vascular accidents is increased.

Equally, one should not forget the secondary effects of the chronic antihypertensive medication upon the oral cavity. The drugs blocking the calcium channels may produce generalized gingival hyperplasia. Also, the antihypertensive, diuretic, sedative drugs may cause xerostomia.

Another frequent disease in old patients is type 2 diabetes. In the group here under investigation, 5 patients (representing 9.09% of the whole group) suffer from type 2 diabetes mellitus.

As known, diabetics are more predisposed to oral infections and periodontal diseases, comparatively with the others, oral infections being more serious in these patients. In the case of diabetics wearing mobile prostheses, a correct hygiene of the prostheses may prevent the occurrence of paraprosthetic stomatitis and of oral candidosis.

Osteoporosis (registered in 4 female patients – respectively 13.8% of the feminine subjects of the group) affects all bones of the body, maxillaries included, thus contributing to tooth loss. The totally edentulous women suffering with osteoporosis are predisposed to a more rapid resorption of the edentated ridge, which renders more difficult the application of prosthetic treatments.

The main manifestations of the disease of Parkinson (diagnosed in 2 patients) include disorders of equilibrium and movement coordination, unstable vertical position, so that the oral and prosthesis hygiene is not satisfactory in such patients, once manual skill is compromised. Also, the xerostomia induced by the drug treatment of this disease causes caries, tooth loss and weak retention of the prostheses on the prosthetic field.

Rheumatic diseases, sight and hearing deficiencies in partially or totally edentulous patients may be associated with a scarce understanding of the treatment plan, reduced access to medical offices and unsuitable hygienization of the prostheses.

Tooth loss, whichever the age it appears, has negative influences upon oral and general health, as well as social and psychological effects. Equally, edentation and its incorrect rehabilitation may reduce life quality, and even the lifetime of old populations.

In the investigated group, both partially, reduced edentation (EPIR - representing 20%) and total bimaxillary (ET in 30.9% of the patients) edentation are registered. Partially extended edentation (EPI) appears in 32.72% of the patients. As to the sex distribution of the various forms of edentation, it was observed that partially reduced edentation is more frequent in men, whereas partially extended and total edentation is prevailing among women (Fig. 6).

The necessary of prosthetic treatment in the old patients of the investigated group appears as follows:

- Conjunct gnato-prosthetic treatments in patients (20% of the group)
- Gnato-prosthetic treatments with partially mobile (acrylic, skeletal, over-lay) and/or total prostheses in 44 patients (80% of the group).

The present study demonstrates, once again, that - in spite of the progress recorded in the medical domains and in the laboratory techniques, as well - partially extended and total edentations still remain clinical cases with a high frequency within aged populations.
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Fig. 6. Forms of edentation of the experimental group

The first clinical case to be discussed in the following assumed oral rehabilitation with preservation of as many odonto–periodontal units as possible, for avoiding installation of subtotal or total edentation.

Clinical examination (Figs. 7, 8) led to the following diagnosis:

- General condition affected by stage I stabilized HTA, which permits stomatological treatments.
- Extended carious lesions at level 1.1, 2.2, 2.3, 3.4, 3.5 of plurifactorial etiology, accompanied by functional masticatory and physiognomic disorders, with slow evolution, non-treated local and loco-regional complications, reserved prognosis.
- Generalized marginal chronic periodontitis of infectious etiology, accompanied by functional masticatory and physiognomic disorders, with slow evolution, non-treated local and loco-regional complications, favourable prognosis under treatment.
- Partially extended maxillary class II Kennedy edentation with 2 modifications, subclass D Lejoyeux, of mixed etiology, accompanied by functional masticatory, physiognomic and deglutition disorders, local and loco-regional complications, favourable prognosis under treatment.
- Partially extended mandibular class I Kennedy edentation, with one modification, subclass D Lejoyeux, mixed etiology, accompanied by functional disorders: masticatory, physiognomic, deglutition, phonatory, with local and loco-regional complications, favourable prognosis, non-treated.
- Malocclusion caused by the absence of static and dynamic occlusion, inducing functional disorders: masticatory, physiognomic, deglutition disorders, with slow evolution, local, loco-regional complications, reserved prognosis, non-treated.
- Dishomeostasis of the stomatognate system, of plurifactorial etiology, with functional disorders, slow evolution, local and loco-regional complications, reserved prognosis, non-treated.
- Right-left ATM disfunction – as a result of partially extended edentation, with condilian excursions of asymmetrical and unequal amplitude, inducing functional disorders, slow evolution, local and loco-regional complications, favorable prognosis under treatment, non-treated.

The prosthetic treatment included:

I. Realization of an Overlay-type prosthesis for the maxillary: metallic crowns at the level of the odontal units: 2.1, 2.3 and totally mobile prosthesis formed of an acrylic saddle, acrylic palatine plaque and artificial dental arch with 14 acrylic anatomorphically-modelled teeth.

II. Mixed prosthesis for the mandible, composed of:

1. Metallo–composite fixed totally physiognomic prosthesis, formed on 3 aggregation elements at the level of 4.3, 4.4, 4.5

2. Metallic crowns at the level of 3.4.

3. Acrylic partially mobile prosthesis formed of two acrylic saddles which support 11 anatomorphically modelled acrylic teeth and elements of maintenance, support and stabilization, two cervical-alveolar claps
made of Wiple wire at the level of teeth 4.3 and 4.5.

The steps of the prosthetic treatment were the following:

1. The pre- and proprosthetic step by adjunct means included:
   Preprosthetically:
   - sanitary education and justification of the therapeutical solution preferred (convincing the female patient on the necessity of the treatment); the written consent of the patient, in relation with the treatment to be applied, was obtained; structuring of the treatment in several steps.
   - general preparation of the organism. The female patient is diagnosed with HTA which, however, does not affect the general condition, being compatible with the gnatotheprosthetic therapy. Psychic preparation was also made, as the patient had had no mobile prosthesis up to now, once known the opposition of subjects to mobile therapy.
   - scaling, periodontal antiinflammatory treatment, rinsings with antiseptic solutions (Chlorhexidine, for removing and preventing bacterial plaque accumulation).
   
   Proprothetically: endodontic treatments for the recovery of the radicular rests 2.1, 2.3 and treatment of the gangrene present at the level of 3.4; its coronary amputation and covering with a metallic crown (tooth with degree II mobility). Extraction of teeth 1.1 , 2.6 (irrecuperable radicular rest) 2.7, 2.8 (teeth with degree III mobility) and 3.5; preparation of the organic substructures 2.1, 2.3, 3.4, 4.3, 4.4, 4.5 [2, 3].

2. The prosthetic step (Figs. 8-12).
   - following the preparation of organic substructures, displaying of the gingival sulcus was made with retracting wire impregnated with aluminium chloride.
   - two-step global bimaxillary imprint for the realization of the fixed prosthesis and of the metallic crown
   - assaying of the metallic skeleton of the conjunct work and of the metallic crown and establishment of the physiognomic component color
   - provisional cementation of the fixed prosthesis
   - laboratory realization of the individual portimprints from the basic plaque and their adaptation in the dental office.
   - functional mandibulary and maxillary imprints
   - realization of occlusion models and registering of the fundamental mandibular-cranial relations
   - checking of the wax model with the teeth
   - application in the oral cavity and immediate adaptation of the mobile prostheses; final cementation of the fixed prosthesis. There followed instruction of the patient about the hygienic maintenance of the prostheses.

Fig. 7 a, b. Extraoral examination - profile norm (a) and intraoral examination (b)
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Fig. 8. Organic substructures prior to (a) and after preparation (b)

a.

b.

Fig. 9. Two-step global maxillary and mandibulary imprint

a.

b.

Fig. 10. Metallic skeleton of the fixed prosthetic work and the metallic crown

a.

b.

Fig. 11. Functional imprints

a.

b.

Fig. 12. Application of finite prostheses in the oral cavity
The second case is that of patient IC, 74 year-old, from the urban medium, retired engineer, who addressed the Clinic of Dental Prosthetic of Apollonia University of Iaşi for solving his functional - masticatory, physiognomic, deglutition, phonatory - disorders. About 12 years ago, he was diagnosed with stage II HTA, and since 2 years, with type II mellitus diabetes. He is an ex-smoker.

The clinical examination led to the following diagnosis:

The general condition affected by HTA and type II diabetes mellitus; class I total maxillary S angiolo edentation and class II partial mandibular Kennedy Applegate edentation with three modifications of mixed etiology, functional disorders, slow evolution, local complications, favorable prognostic, non-treated; dishomeostasis of the stomatognate system.

The treatment plan included: realization of a total maxillary prosthesis formed of an artificial dental arch with 14 acrylic teeth, anatomorphically modelled, an acrylic saddle and an acrylic palatinal plaque. Composite (hybrid) prosthesis for the mandible: gnato prosthetic conjunct apparatus formed of 6 aggregation elements - semiphysiongmic metallo-composite crowns at the level of teeth 3.4, 3.3, 4.2, 4.3, 4.5, metallic crown at the level of tooth 4.8 and bridge bodies at the level of 3.2, 3.1, 4.1, 4.4, 4.6, 4.7; also associated was a Rhein ® 83 anchorage system as a component part of an uniterminal skeletal prosthesis, formed of a mixed metallo-acrylic saddle which supports 3 anatomorphically modelled acrylic teeth, with special anchoring elements – extracoronal burning prefabricated attachment [1, 3].

Following the preparation of the organic substructures 3.4, 3.3, 4.2, 4.3, 4.5 and 4.8, imprints were taken by means of standard portimprints, of alginate (maxillary) and solid silicone (time 1), and of fluid one (time 2) for the mandible. There followed casting of the preliminary (study) maxillary and mandibular models and realization of the individual maxillary portimprint.

Another step involved realization of the prototype of the metallic skeleton of conjunct AGP in the dental office. For the maxillary, the functional imprint was obtained with the individual portimprint made of photopolymerizable resins.

The occlusion model was employed for the clinical evaluation of the fundamental mandibulo-cranial relations and their restoration. There followed testing of the maxillary model made of wax and, in a subsequent session, application of the total maxillary prosthesis in the oral cavity and its immediate adaptation. There followed the temporary cementing of the conjunct prosthesis, and the application – through retention of the Rhein system Final cementation of the conjunct prothesis was done 7 days later.

4. CONCLUSIONS

1. In spite of the progress registered in all medical fields, in laboratory technologies and biomaterials, partially extended, subtotal and total edentation continues to record a high frequency among old populations.

2. Prolongued evolution of total and partially extended edentation, causing deep loco-regional modifications, against the background of some general diseases with specific medication, known as influencing the oral cavity, makes difficult mobile prosthesizing of geriatric patients.

3. Any gnato prosthetic treatment applied to old persons should consider several general aspects (physiological involution, general pathology, drug therapy prescribed for systemic diseases), in close correlation with certain local aspects and their implications upon the oral cavity, as well as upon life quality.
4. A successful variant in subtotal edentation, when the patient has an unfavorable prosthetic field, dominated by resorbed alveolar ridges or with more restant teeth with an unsuitable topographic distribution for other therapeutical treatments, is provided by Over-lay prosthesis. At the same time, this type of prosthesis appears as a very good treatment method in patients with teeth with degree 2 mobility, generally not indicated as abutement teeth, the usual solution being their coronary amputation and a correct treatment of roots, including their covering with metallic crowns.

References