CONSIDERATIONS ABOUT PERIODONTAL PROSTHESIS

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ABSTRACT

Nowadays, the incidence of prosthetic treatment in patients with reduced periodontal support is on the rise, and the elderly population is the greatest responsible for this fact. To reach success in the treatment, the clinician must have a multidisciplinary view, establishing a correct diagnose and treatment plan for each case. The aim of this paper is to present a review of the literature on periodontal prosthesis, showing occlusal, prosthetic, periodontal, mechanic and biological consideration to help and guide the c linician in this modality of treatment.

KEY WORDS: periodontal prosthesis; periodontal splinting; tooth hypermobility

INTRODUCTION

There are many options to treat patients with advanced periodontal disease, including the combined prosthetic-periodontal treatment with construction of ample fixed partial prosthesis. The literature (AMSTERDAM, 1974; AMSTERDAM; WEISGOLD, 2000; HOCHMAN; YAFFE; EHRLICH, 1992; NYMAN; ERICSSON , 1982; NYMAN; LINDHE, 1979; YI; CARLSSON; ERICSSON, 2001) indicates the biological capability of a tooth with reduced periodontal to support a fixed partial prosthesis, namely periodontal prosthesis.

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Many studies are being conducted in this field aiming to clarify the intimate relationship of the dental element to its periodont, both in its protection and supporting aspects. These studies are fundamental to the clinical practice because the area of interrelation between tooth and gum is the site where the aggressions resulting from the preparation of the cervical edge of the tooth, reshaping of provisional crowns, molding procedures, the presence of a cement line and of the adaptation of the edges of a prosthetic restoration that, many times, is localized in a sub-gingival level because of purely aesthetic reasons take place.

This being said, its is necessary to acquire adequate knowledge of the biological relations between the tooth and the periodont, and also on the characteristic presented by periodont affected patients that are in need for rehabilitation treatment. After that, the treatment may be done in a rational way allowing the dentist to foresee the final result and work with a favorable prognosis for each case.

The clinical picture of a patient with an affected periodont may bear some peculiarities that should be identified by the dentist, such as: possible acute infections in the periodont, which should be properly treated; presence of deep periodontal pouches leading to a variety of degrees of severity of dental mobility and migration; posterior occlusion collapse with dental loss in this area or anterior occlusion collapse with dental loss and anterior dental migration; disadvantageous crown-root rate and aesthetic impairment, among others.

Based on the available literature, the present study aims to discus the main topics that should be addresses when dealing with treatment with periodontal prosthesis and aid the clinician to plan and execute this modality of treatment.

LITERATURE REVIEW

The option for treatment with prosthesis applied on teeth with reduced periodontal support distinguish a patient that easily accepts loss of one or two dental elements from another that is not willing to face this possibility and that spends large amounts of money and time to, notwithstanding, have a doubtful prognosis (AMSTERDAM, 1974; AMSTERDAM; WEISGOLD, 2000)

Concern with alteration in tissues that support dental elements started long ago and the condition was first named by Roy (1930) as Alveolar pyorrhea (ROY, 1930). Characteristically, the disease was curable by a combination of treatment such as systemic intervention, a rigorous regimen of oral hygiene, radicular scraping from remo-

ving adhered calculus to the roots, elimination of possible occlusal trauma and dental splinting for movable teeth.

To the stabilization of dental elements it was suggested the use of a great number of plans inside the arch (totaling five) aiming to obtain a greater stability of the pillar teeth for the fixed partial prosthesis constructed on a damaged periodontal dental support. This concept was largely known as Polygon of Roy and it is still used nowadays inclusively in the surgical planning (FIGURE 1) to define the distribution of osteointegrate implant in the arch (NEVINS, 1993).

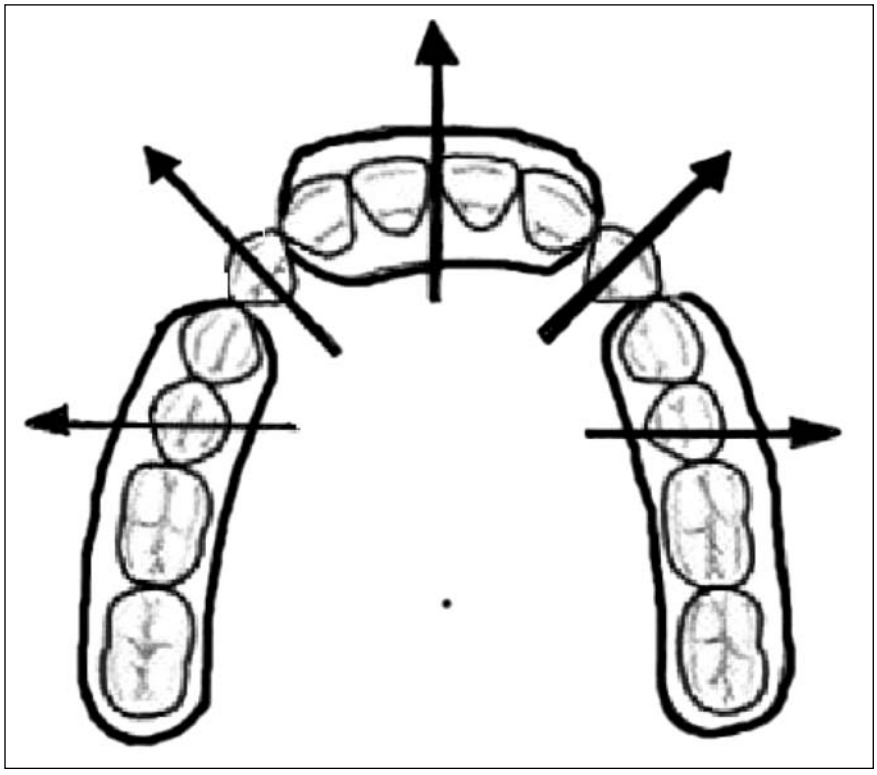

FIGURE 1 - Plan for possible dental mobilization as defined by the polygon of Roy.

Regarding the etiopathology of the periodontal disease, the presence and the bacterial colonization of the periodontal area are responsible for the onset of an intense inflammatory process leading to bone loss and periodontal pouches, dental mobility and migration (ROSENBERG, 1975). The presence of *Actinomyces Actinomycetencomitans*, a gram positive bacteria, is intimately related to the presence of supra gingival plaques and accounts for more than 50% of the bacterial population in this region whereas the sub gingival plaque, found when actives pouches are present, is mostly colonized by gram negative organisms. Nyman and Lindhe (1979) report that "almost all, if not all, forms of periodontal disease are associated to

the presence of plaques". In this connection, the main factors to be addressed in periodontal therapy are the types and virulence of the provocative organisms and not the ability of the host to resist the aggression (AMSTERDAM, 1974).

Teeth with severe loss of periodontal support and with progressive mobility can be used as reliable pillars for ample fixed partial prosthesis (FPP) allowing to restore periodontal health and to maintain these dental elements in the oral cavity. For that the patient should participate in a detailed program of maintenance and oral hygienization during and after the rehabilitation treatment (NYMAN; ERICSSON, 1982).

Following up 60 FPPs for 8 to 11 years, Nyman and Ericsson (1982) showed that teeth with reduced periodontal support, beyond the limits of acceptance to act as retentive of a FPP according to the Ante's law, might be used successfully in this function. Only 8% of FPP were planed accordingly to the Ante's law and the majority of cases (57%) the FPP had less supportive periodontal tissue than 50% of the value of the area of periodontal support of the replaced teeth and, even so, all studied FPP kept their function along the study without loosing their insertion around the pillar teeth. The findings were similar to those reported by Yi et al. (2201) in which FPP were installed in patients presenting, in average, less than 33% of the ideal periodontal support in the pillar teeth.

Therefore, to have a favorable prognosis in treatment with periodontal prosthesis it is advisable to adopt a logic sequence along the clinical approach, starting with eliminating local and occlusal etiological factors, followed by a provisional rehabilitation and teeth stabilization. The next step is the definitive periodontal treatment (surgical) followed by the prosthetic phase and, finally, the phase of follow-up and maintenance of the patient (NEVINS, 1993; ROSENBERG, 1975).

The treatment of inflammation and the control of the occlusal forces acting on the periodonticaly shattered teeth should be analyzed in detail since the occlusal forces are destructive in the presence of inflammation (KEOUGH, 1992). The magnitude of the force and the health pattern of the periodont are the determining factors for the occlusal force to be harmful or not the periodont. The main objectives of the occlusal therapy in candidates to periodontal prosthesis are (i) to create an occlusal sketch where occlusal forces can be evenly distributed on all remaining teeth, preventing the onset or parafunction and enhancement of destructive forces that may occur on the remaining teeth, (ii) to protect and to maintain the TMJ in a safe and healthy status and (iii) to obtain a position in centric rela-

tion coincident to the maximum usual intercuspidity (AMSTERDAM, 1974; KEOUGH, 1992). All these proposed factors should be evaluated in the phase of provisory crows and, later on, should be addressed also to the phase of final prosthesis.

DISCUSSION

Adequate planning of a case is based in a correct diagnosis resulting, thus, in a well-executed treatment with a favorable prognosis (AMSTERDAM, 1974; AMSTERDAM; WEISGOLD, 2000). To attain that, some measures are essential. Despite the technical limitations and the relative imprecision, probing the periodontal pouches is of great value to the diagnosis and planning, provided it is done correctly. Besides that, probing allows access to areas of furcation involvement and or bone sinus (GOLDMAN; COHEN , 1997). Detailed R-ray evaluation is also mandatory to the rehabilitative treatment with periodontal prosthesis as an aid to the diagnosis.

The integrity and maintenance of biological distances should also be addressed by the dentist. These are provided by measuring the gingival sulcus, the junctional epithelium and the conjunctival insertion. These distances are necessary to the tissues to morphologically and histological organizing themselves in physiological condition (GARGIULO, 1961). The analyzes of the quantity and quality of the gingiva inserted and keratinized about the pillar teeth of the prosthesis should also be considered before the prosthetic restoration of the case (PEGORARO, 1998).

It is important to stress that the type of periodontal philosophy to be adopted depends on the individual patient's major needs. These philosophies may be summarized in the elimination and maintenance of periodontal pouches. Whenever possible, the elimination of the pouches should be done (GOLDMAN; COHEN , 1997). However, in sites where the aesthetic is a prominent factor the maintenance of the pouches should be considered. Furcation lesions should be correctly diagnosed and treated by resection or regenerative procedures since they constitute a site for plaque gathering (AMSTERDAM, 1974; GOLDMAN; COHEN, 1997).

Mobile teeth should not be spared from treatment since the use of a correct splintage and adequate hygienization may lead these teeth to a favorable outcome as observed by Hochman et al. (1992). It is important to stress that splinting seldom increased the periodontal health and, on the contrary, may hidden worsening of the disease as it prevents increasing of the dental mobility (WAT-

KINS; HEMMINGS, 2000). Therefore, the decision for splinting should not be taken on superficial data. It should be considered only in those cases that had an adequate periodontal approach and presenting detailed control of the oral hygiene, mainly in those patients that present all remaining teeth splinted by prosthesis.

In what concerns the occlusal patter n to the constr uction of periodontal prosthesis, it seems that the ideal is that patter n where the ocllusal forces are directed along the dental axes, with RC coincident to the MIH and with occlusion guides w ell established (KEOUGH, 1992).

It is essential that some biological and anatomical principles be clearly observed while manufacturing a periodontal prosthesis. In this way, there should be an adequate space for h ygienization of the pillar and bridging teeth, which should have a convex shape on all its sides, the edge adaptation of restoration should be adequate and the profile of the emer gence of the restoration should not f avor plaque gathering nor the excessive compression of the gingi val tissues.

The plastic factor should be judiciousl y evaluated. Some resources to obtain a favorable look, such as the gingival conditioning for papillae for mation, procedures such as muco gingival surgery and the use of ar tificial gingival should be considered and introduced to the patients as an acceptab le and viable option from the biological and financial point of view.

FINAL COMMENTS

After considering the topics above some important points can be stressed:

Recognition of the real needs of the patient to the proposed treatment and the correct diagnosis will aid to establish the prognosis;

The philosophy of pocket elimination (zero sulcus) in patients with periodontal disease is the most indicated one to attain success in the prosthetic reconstruction;

The harmonically distribution of the occlusal contacts and the reestablishment of the lateral and protr usive excursions are the required architecture for occlusion in the periodontal prosthesis;

Prosthesis should be stab le, well adapted and comfor table, restoring esthetic, phonetic, function and allo w easy access to hygienization.

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