PERIODONTAL CONSIDERATIONS IN FIXED PROSTHESES
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ABSTRACT
Restorative dentistry is by far the most important factor for plaque accumulation. Purpose The study aimed at assessing the periodontal condition relating to the existence of iatrogenic fixed prosthetic therapy. 

Material and methods. The studied sample consisted of 47 patients, including 23 men and 24 women aged between 18 and 65 years. We assessed the existence of periodontal damage related to local restorative iatrogenic factors. 

Results and discussion. In the examined patients were noted numerous discrepancies both in terms of margins placement relative to the gingival sulcus related to abutment teeth preparation. Vertical and horizontal discrepancies, occurring in marginal adaptation of restorations may be the reasons for periodontal irritation. Therefore, it is necessary to avoid the apical extension of the margins by unnecessary sinking of the margins of the preparation, which will lead to alteration of the epithelial insertion of at the level of the cemento-enamel junction Important in this respect is the thickness of the crowns margins. 

Conclusions. The restorative treatment objective is long-term maintenance of the masticatory system in good health condition. Dental restorations and periodontal health are closely linked-periodontal health is necessary for proper operation of all restorations, while functional stimulation provided by dental restorations is essential in periodontal health.

Keywords: periodontal health, prosthetic treatment

INTRODUCTION
Prosthetic restorative dentistry is by far the most important factor for plaque accumulation. Poorly executed restorations provide good support for plaque accumulation, so gingivitis occurs or worsens. The final evaluation of restorative treatment should be judged not only by aesthetic and functional criteria, but also anticipating the effect that restoration will have on periodontal structures. Each dental restoration has a periodontal dimension which plays an important role in long-term prognostic of the respective tooth. It is very important to understand how the restoration contributes to the accumulation of plaque and periodontal disease. An unjustified extension of the restoration margins may induce detrimental effects on the gingival sulcus.

AIM OF STUDY
The study aimed at assessing the periodontal condition relating to the existence of iatrogenic fixed prosthetic therapy.

MATERIAL AND METHODS
The studied sample consisted of 47 patients, including 23 men and 24 women aged between 18 and 65 years. We assessed the existence of periodontal damage related to local restorative iatrogenic factors.

Complete physical examination was conducted, which aimed to identify the
emergence of iatrogenic periodontal disease, including additional tests (Rx, photos).

Periodontal examination was performed by inspection, palpation, and assessment of tooth mobility, the examination and interpretation of Rx. The intensity of inflammation was assessed by the intensity of bleeding (PBI Index-Saxen and Muhleman). We assessed also the reports existing between the gingiva and the margins of the prosthetic crowns, the attachment level, maintaining of normal insertion or migration of the epithelial junction, there recession or periodontal pockets due to iatrogenic factors.

Radiographic examination was done on retro-alveolar clichés or dental panoramic radiographs who gave an overview of the affected structures.

In restoring the integrity of the arches by bridges, we followed whether or not the principles of treatment (preventive and curative) were respected:

- marginal axial and transverse adaptation of the gnato prosthetic elements
- placement of the margins of the prosthetic restorations (crowns),
- restoration of coronary contours
- placement of proximal contacts and realization of embrasures.

The relation between the pontic and the periodontium of the abutment teeth, the width of the attached gingiva.

Diagnosis of disease was established upon registration of general medical history, a dental anamnesis and on all the elements found in the teeth and periodontium, by clinical examination, periodontal probing and radiographic examination.

RESULTS AND DISCUSSIONS

In the examined patients were noted numerous discrepancies both in terms of margins placement relative to the gingival sulcus and based on their technological achievement or discrepancy related to abutment teeth preparation (fig. 1).

Vertical and horizontal discrepancies (fig.1.), occurring in marginal adaptation of restorations (faulty margins), coronal contour changes, the appearance of the embrasures as well as the thickness of the crowns margins assessed at the clinical examination or after removing the crowns/bridges, may be the reasons for periodontal irritation [1].

An improper tooth preparation will yield organic substructure of inadequate margins wish will lead to a prosthetic restoration with leaky contour or rough margins which makes difficult to perform plaque control (Fig. 2), and which will lead to difficulties in the long-term maintenance of the periodontal health [1].
Such marginal discrepancies that do not achieve perfect sealing, have a significant role in emphasizing gingival inflammation, especially when are sub-gingival placed and acts as an ecological niche for plaque buildup by the micro-porosity and roughness of the restorative material [2].

An unjustified extension of the restoration margins may induce detrimental effects on the gingival sulcus (Fig. 3).

**Figure 3. Over-extension of the crowns margins which induce detrimental effects in the gingival sulcus**

Therefore, it is necessary to avoid the apical extension of the margins by unnecessary sinking of the margins of the preparation, which will lead to alteration of the epithelial insertion of at the level of the cemento-enamel junction [3]. Important in this respect is the thickness of the crowns margins (small thickness will make a perfect adaptation) Thick margins of crowns (threshold preparation) though facilitating plaque control, have drawbacks in finishing [4].

Improper prosthetic therapy helps defining the occurrence of iatrogenic associated periodontal pathology [5].

In proximal area restoration by prosthetic means, the volume of the space is dependent on the anatomy of the proximal area of the contact surface of the teeth which change in the physiological or pathological conditions.

Along with changing the appearance of the contact area and its position, the retentivity of the area with embrasure volume reduction, diminishing the cervical papilla space, hence periodontal involvement.

**Figure 4. Periodontal pathology induced by applying an bridge with over-extended crown margins**

Measures to prevent periodontal tissue trauma consist in faithfully reproduction of the morphology of the tooth.

The quality of the marginal adaptation not only plays an important role in preventing secondary caries, but also influences the periodontal status. Regarding the effect on periodontal tissue of the over-extension of the margins, it was found that there is a direct correlation between a poor marginal adaptation and periodontal disease [2]. Furthermore, we found that there is a positive correlation between the margins of the restoration and the reduction in height of the inter-dental alveolar bone, especially when there are deficiencies in marginal adaptation,
a thick cement film, thus creating an enlargement of the sulcus which favours the accumulation of plaque.

Surface state of the crowns margins contribute to mechanical irritation and plaque retention. It was found that a rough surface in contact with the gingival tissue is a factor for gingivitis, not only because of mechanical irritation, but especially because retention of plaque [5].

The only area that would favor the accumulation of plaque and debris being the cervical area, in fixed prostheses, the presence of smooth and shiny surfaces, without edges or sharp slopes, contributes to gingival health preservation.

**Figure 5. Defects in the surface state of crowns margins**

A particularly controversial issue but with direct repercussions on the final therapeutic results of fixed prostheses is the placement of restoration margins respective to gingival sulcus.

Periodontal tissue lesions can be a consequence of:

- The type of preparation and the methodology used (the dental prosthetic joint)
- Inherent inaccuracies in achieving the restoration
- Use of retractor material
- Horizontal and vertical discrepancies arising in marginal adaptation of the crown
- Occlusal discrepancies

In the area represented by the ensemble-prosthetic restoration-tooth preparation, the marginal gingiva is the most sensitive area of the three. Hereby, true ecological niche results for bacteria and is home to numerous infiltrations.

The evolution of modern tooth preparation techniques, the instrumentation used and the materials needed for definitive fixation led to major changes with beneficial effects on periodontal health.

Tooth preparation with any rotary instruments under the gingival margin is a trauma of varying degrees of the surrounding periodontal tissues, which is why the tooth preparation procedures must be performed carefully to avoid any damage that may arise and to preserve periodontal health.

A preparation must ensure retention and stability of prosthetic reconstruction so the marginal adaptation will be adequate, with enough space for the restorative material and the fixing material (cement).

Imperfect placement of the preparation of the tooth surface increases the risk of periodontal pathology installation. The existence of poorly processed or irregular margins greatly increase the size of the margins and reduces adaptation [5].

In preparation of periodontally compromised teeth, the biological and conservative principles can not always be met because of the need to place the margins of the crowns sub gingival, for aesthetic reasons, that coaches and additional reduction of the tooth [3].

Maintaining of gingival health will be ensured only by creating a prosthetic profile which will allow the control of plaque.

An over-contouring of the restorations increases the possibility of plaque and debris retention in the vicinity of the gingival margin, creating an area inaccessible to its removal. As a consequence, the biological principle should govern any action.
undertaken in restorative treatment of teeth or dental arch in order to maintain the health of periodontal tissue for long periods of time [6].

Of particular importance is the correct assessment of periodontal status in the pro-prosthetic treatment stage and assessment of existing general or local risk factors [7]. The restoration is accurately placed on the tooth, the periodontal damage risk is reduced.

**CONCLUSIONS**

- The restorative treatment objective is long-term maintenance of the masticatory system in good health condition.
- The clinical evidence shows that very few patients with bridges have good oral health, the resistance to periodontal disease is very low, and contributing factors out the more obvious.
- Periodontium is obviously traumatized during operative procedures. The physician should work with the greatest care to mitigate the trauma, so it can heal damaged tissues as well.
- Daily faced with increasingly iatrogenic induced periodontal pathology, we are aware of the actuality dictum "Primum non nocere" and by our professional attitude and skill not to do more harm than good.
- Dental restorations and periodontal health are closely linked-periodontal health is necessary for proper operation of all restorations, while functional stimulation provided by dental restorations is essential in periodontal health.

**REFERENCES**