Preliminary Study About The Complications Which Can Appear In Restoring An Edentulous Space With Fixed Prosthesis

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Abstract

The partial edentation is one of the most frequent encountered oral pathologies, its restoration being usually made with integral/partial physiognomical fixed prosthesis.

The incorrect execution or choice of the dental materials to be used for the manufacturing of the restoration, lead to the occurrence of multiple effects: the feeling of discomfort, the mobility of the fixed prosthesis, loosening of the prosthesis, periodontal decompensation, cavities and pulp complications of the abutment teeth, gum retractions and alveolar resorptions because of the overload of the abutment teeth, perforation of aggregation elements, fracture of the fixed prosthesis mediators, fracture or detachment of the facets, lack of functionality of the prosthesis, gum inflammations, gum coloration, metallic taste.

We studied in a group of 169 patients the negative effects produced by inserting in the mouth of conjunct prosthetic restorations made or adjusted incorrectly.

Treatment success rate in the studied group of patients was 76.92%. 39 cases were considered failures by complications that endanger long-term prognosis of restorations. The frequency of complications, in descending order, was: development of dental caries (20.51%), fracture of esthetic components (19.44%), fracture of metal components (15.38%), gingival and alveolar resorptions (15.38%), gum stains (12.82%), loss of physiognomic appearance (10.25%), gingival bleeding and suppuration (7.69%).

Keywords: partial edentation, fixed prosthesis, iatrogenic, dental materials

Introduction

The partial edentation represents the absence of one to fifteen dento-periodontal units from a dental arch. Through the loss of the dento-periodontal units, on the dental arch will appear discontinuities, named edentulous spaces [1].

The untreated partial edentation determines the development of a subjective and objective symptomatology
that progressively worsens, as complications appear locally, regionally and at distance. The symptomatology of the partial edentation has a great impact on the essential orofacial functions, such as chewing, phonetics and the physiognomical appearance by losing the vertical dimension of occlusion and the occurrence of dental migration.

The restoration of the reduced partial edentation and the compensation of the affected functions are performed by using fixed prostheses.

Prognosis of fixed prosthetic restorations (RPF) is extremely difficult to assess [1-13], because in the integration of RPF is there a wide range of factors [14].

The incorrect execution or the improper choice of the dental materials used in order to manufacture the restorations, leads to the occurrence of multiple undesired effects such as: the feeling of discomfort, the mobility of the fixed prosthesis, loosening of the prosthesis, periodontal decompensation, cavities and pulp complications of the abutment teeth, gum retractions and alveolar resorbtions because of the overload of the abutment teeth, perforation of aggregation elements, fracture of the fixed prosthesis mediators, fracture or detachment of the facets, lack of functionality of the prosthesis, gum inflammations, gum coloration, metallic taste.

The aim of our study is to analyze the negative effects on 169 patients, generated by the insertion in the oral cavity of prosthetic restorations manufactured or adjusted incorrectly.

**Methods**

The study was made on 203 patients, whose partial edentations have been restored at least 5 years, patients who addressed themselves to a number of five different dental offices in Bucharest, in the period of October 2010-January 2012 for various dental reasons. From the study, there has been excluded a number of 34 patients, who had extended partial edentations, restored with removable prostheses, that means that in the end, just 169 patients were part of the study, patients whose partial edentations were restored worth fixed prosthesis.

Cases in which RPF had at five years functionally, biological and aesthetic integrate appropriate were considered successful and cases where complications endanger long-term prognosis of the restorations were considered failures.

After some authors [4-10] are mainly nine possible causes of failure of the RPF: development of cavities in the abutments which can not be treated without removal of the RPF, need for endodontic treatment at the abutment teeth which can not be performed properly without ablation of RPF, aesthetic deficiencies due
gingival or gum pigmentation, gingival inflammation, periodontal reasons (mobility/loss of bone support on abutment teeth), tooth fracture, broken bridge, fracture of physiognomic material, abrasion on antagonists tooth.

The patients were classified according to age, gender, the location of the edentation, its etiology and type of the complication that led to failure of the prosthetic treatment.

**Results**

The studied group of patients was made of 54 male patients and 115 female patients. Dividing the patients according to the group of age they belong to, we obtained: 5 male patients and 9 female patients (ages 41-50), 19 male patients and 42 female patients (ages 51-60), 22 male patients and 49 female patients (ages 61-70), 8 male patients and 15 female patients (ages 71-80) (Table I).

Regarding the location of the partial edentation, we observed the existence of 105 edentations at the maxillary level and 64 edentations at the mandibular level. The female patients presented a number of 70 maxillary edentations and 45 mandibular edentations, whereas the male patients presented 35 maxillary edentation and 19 mandibular edentation (Table II).

The etiology of the teeth loss was in 78 of the cases the dental caries and its complications, in 60 of the cases the periodontitis and in 31 of the cases iatrogenies (Table III).

The success rate of the treatment on the studied patients was 76, 92%. Thereby, from the 169 cases, 39 patients presented the following complications: the

| Table I. The distribution of the patients according to age and gender |
|-----------------|---------------|---------------|---------------|---------------|
| Patients        | Groups of age |
|                 | 41-50 years  | 51-60 years  | 61-70 years  | 71-80 years  |
| Male            | 5             | 19            | 22            | 8             |
| Female          | 9             | 42            | 49            | 15            |
| Total           | 14            | 61            | 71            | 23            |

| Table II. The classification of the patients according to the location of the edentation |
|-----------------------------------------------|---------------|---------------|
| Patients          | The location of the edentation | Total |
|                  | Maxillary | Mandible |
| Male              | 35        | 19        | 54        |
| Female            | 70        | 45        | 115       |
| Total             | 105       | 64        | 169       |

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fracture of the physiognomic component, the fracture of the metallic component, the loss of the physiognomic aspect, gum bleeding and suppurations, gum coloration, gum retractions and alveolar resorptions, the evolution of carious processes at the dental abutments level (Table IV, Figures 4-17).

Table III. The edentulous etiology of the studied patients group

<table>
<thead>
<tr>
<th>The complicated dental caries</th>
<th>Periodontitis</th>
<th>Iatrogenies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>78</td>
<td>60</td>
</tr>
</tbody>
</table>

Table IV. Types of found complications

<table>
<thead>
<tr>
<th>Types of complications found</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>fracture of the physiognomic component</td>
<td>7</td>
</tr>
<tr>
<td>fracture of the metallic component</td>
<td>6</td>
</tr>
<tr>
<td>loss of the physiognomic aspect</td>
<td>4</td>
</tr>
<tr>
<td>gum bleeding and suppurations</td>
<td>3</td>
</tr>
<tr>
<td>gum coloration</td>
<td>5</td>
</tr>
<tr>
<td>gum retractions and alveolar resorptions</td>
<td>6</td>
</tr>
<tr>
<td>evolution of carious processes at the dental abutments level</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
</tr>
</tbody>
</table>

Figure 4. The fracture of the physiognomic component, at a metal-ceramic restoration, due to occlusal factors

Figure 5. The fracture of the physiognomic component, at a metal-ceramic restoration, due to a design error (the manufacturing of a total prosthesis for the mandible)

Figure 6. The fracture of the metallic component due to an incorrect hardware technique, food retentions due to the incorrect conformation of the apertures, gum inflammations because of the acrylic component, the loss of physiognomical aspect through visibility of the metal, through acrylic transparency and due to impregnation of the materials with alimentary dyes

Figure 7. At maxillary level: the fracture of the metallic component due to the incorrect hardware technique, gingival bleeding due to the inflammation produced by the acrylic component, alimentary retentions due to the incorrect adjustment of the apertures and the loss of the physiognomical aspect through the coloration of the acrylic component produced by nicotine. At mandibular level: the fracture of the physiognomic component due to the inefficient retention and gum retraction through the improper outline of the aggregation elements

Figure 8. The fracture of the metallic component due to an incorrect hardware technique

Figure 9. The fracture of the metallic component due the overload produced by the excessive length of the edentulous space and the fracture of the physiognomic component at the incised level through insufficient retention and occlusal overload
The feeling of discomfort is a common incident observed after the fixation of the prosthetic restorations and may be caused by: the presence of premature contacts or occlusal interferences, the insertion of the prosthesis in an inadequate position, a oversized or reduced occlusal surface [9,10], overpressure on the dento-periodontal support units [4,5], too close contacts with the adjacent teeth, the insufficient protection of the gum tissues or the accumulation of alimentary debris within the prosthesis, due to its inadequate design [12].

The mobility of the fixed prosthesis may occur in case of aggregation elements deformation, dysfunctional occlusal contacts, incorrect cementation, cement solubilisation, carious processes occurring at the abutment teeth (because of poor hygiene, incorrect adjustment of the aperture, too large or too short aggregation elements), the mobility of one or more
abutment teeth through periodontal decompensation [4,5], the lack of retention of the aggregation elements through incorrect preparations.

The gingival retractions and the alveolar resorptions may be determined by: overuse of the abutment teeth through the excessive length of the spaces, the inadequate conformation of the gum apertures, the improper outline of the aggregation elements [8], the choice of an insufficient number of abutment teeth.

The metallic skeleton of the intermediate teeth can be fractured due to the incorrect technique of hardware and the manipulation of the alloy or through overload of the fixed partial prosthesis due to a very extended space [4].

The physiognomic component fracture of the fixed partial prostheses may occur due to an inefficient retention, occlusal factors or design errors (the manufacturing of total prostheses for the mandible, without regarding its mobility) [6,7].

Conclusions

The studied group consisted mostly of female patients belonging to the age group 61-70 years.

The location of the edentation was in 62.13% of the cases at the maxillary level. Regarding the etiology of the edentation, in 46% of the cases it has been produced as a result of the caries process evolution, in 36% of the cases because of periodontitis and in 18% of the cases due to iatrogenies.

Treatment success rate in the studied group of patients was 76.92%. 39 cases were considered failures by complications that endanger long-term prognosis of restorations. The frequency of complications, in descending order, was: development of dental caries (20.51%), fracture of esthetic components (19.44%), fracture of metal components (15.38%), gingival and alveolar resorptions (15.38%), gum stains (12.82%), loss of physiognomic appearance (10.25%), gingival bleeding and suppuration (7.69%).

References


