WHEN TO REMOVE TRADITIONAL FIXED PROSTHESES?

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A R T I C L E  I N F O

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A B S T R A C T

The evolution of fixed prosthesis production techniques makes it possible today to obtain prostheses that are too often considered as "definitive" because of a great deal of aesthetic and functional precision. However, despite the respect of the various stages of development, no practitioner can claim to be safe from prosthetic failure. This is valid regardless of his experience, his rigor or his skill. These risks can be prosthetic origin periodontal, endodontic, aesthetic or functional.

INTRODUCTION

According to WHLIE BENBERG, removal is a "challenge that allows to judge the intelligence, ingenuity and capacity of the practitioner, a challenge made even more difficult by the improvement of cast techniques"[1].

There is no certainty regarding the longevity of fixed prothestic treatments, but the clinical studies (SCURR IA [2]) on the subject reasonably agree on an average lifespan of about 10 to 15 years. Indications of re-operation are unfortunately too numerous. They are often the cause of a loss of confidence of the patient vis-à-vis his practitioner, a significant source of stress for the latter and represent a significant financial cost for both. The practitioner must always explain to his patient, that fixed prosthesis does not mean definitive prosthesis (fig. 1,2).

In this article we will review the causes of the following nature:

- General;
- Periodontal and prothestic;
- Endodontic and Dental;
- Esthetics.

General etiology[3,4]

Some patients require, for medical reasons, exploratory examinations such as magnetic resonance imaging (MRI) or a computed tomography (CT).

The presence of alloy used in the composition of certain prosthetic elements generates artefacts and justifies the need to remove them. Also, the use of certain metals (nickel, chromium)

Fig 1 Panoramic X-ray: important bone resorption with mediocre prosthetic design.

Fig 2 Removal of the mandibular bridge with extraction of the abutment teeth without effort.
in sensitive subjects, causes the emergence of allergic reactions which force the disassembly of the elements involved (fig.3).

In addition, the presence of several metals, of different nature and with a large potential difference, creates ionic fluxes that cause galvanic micro-currents at the origin of metalloses or intolerances.

And finally, the aging of the population, the awareness of the importance of dental care and the evolution of techniques make the recurrence of doing a fixed prosthesis of a dent not uncommon during one’s lifespan.

**Periodontal and prosthetic Etiology**

A perfect knowledge of the clinical aspect of a pathological periodontium (color, mobility, gingival recessions, periodontal pockets ...) completed by a radiological examination (bone resorption, biological space ...) allows to unseal a possible disease and therefore to consider the removal [5].

**Failures related to a diagnostic error**

Most of the prosthetic failures considered from the periodontal angle are due to misdiagnosis. They are generally related (fig.4,5):

- Either to a bad analysis of the motivation of the patient;
- Or a poor periodontal evaluation (pathology of periodontal support tissues) and / or occlusal (traumatic occlusion) pre-prosthetic;
- Or in connection with a misinterpretation of the radiological image;
- Or in connection with a wrong prosthetic realization.

**Failures related to an error during prosthetic treatment may be related to**

**The dental preparation**

The periodontal integration of the prosthetic elements depends on the presence of a biological space and the quality of the muco gingival tissues [6].

Its aggression leads to a chronic attack, with apical migration of the marginal gingiva and serious aesthetic consequences (fig.6).

An over-contour causes chronic compression of the periodontal tissues (gingivitis, periodontitis) while the sub-contour contributes to the creation of food niches (carious risk, gingivitis ... etc.) [7,8].
Clinical trials: (fig.7,8)

Fig 7 Multiple dental preparations for receiving metal-ceramic restorations.

Fig 8 When trying the restoration, the gingiva should not appear whitish. During fitting, the gingiva must retain its color, if it whitens then too much support has taken place in the cervical region.

Respect of the papillae is allowed by open embrasures, allowing good access to hygiene by the patient.

Overly closed embrasures cause compression of the papillae, with inflammation that will become chronic, jeopardizing periodontal health [10].

The occlusal function

Occlusal trauma has been the subject of numerous studies in the development of periodontal problems, all of which conclude that it is responsible either for a healthy periodontal period or with a particular pathology, hence the importance of occlusion adjustment (fig.9) [11,12]

The quality of the occlusal integration of a prosthetic element is essential for its durability (fig.10,11).

Failure to respect the occlusal morphology (over-occlusion, sub-occlusion, erroneous triturating anatomy, etc.) causes a shift in the intermaxillary ratios with a repercussion on the articular and muscular structures.

Prematurities and interferences cannot be eliminated by simple coronoplasty, they will be corrected by realizing new prostheses.

Fig 9 Ceramic's fracture due to an occlusal disorder.

Fig 10 Bridge's fracture at the connection ...

Fig 11 Due to reduced usable occlusal height, note the reddish appearance next to the pontic.

Fig 12 These 2 metal-ceramic restorations do not present any apparent problem.
**Endodontic and dental etiologies** [9,13]:

**Endodontic pathologies**

The preservation of pulp vitality should always be preferred, for reasons of strength and as a warning signal.

This, the realization of crowns on living teeth is an act requiring a great thoroughness in its elaboration.

Failure to comply with certain principles (new dental drills, under irrigation, intermittence) leads to a "dentin wound" that can go as far as necrosis (fig.12,13).

![Fig.13](image)

**Fig.13** The radio examination shows an insufficient canal treatment on the 16 which must be resumed.

It is then necessary to either remove the crown or cut an access cavity through the occlusal surface of the crown to perform the endodontic treatment (fig.14).

![Fig.14](image)

**Fig.14** But the presence of the inlay-core prevents the resumption of endodontic treatment through the crown and leads to the removal with section of the restoration.

**The carious recovery**

A poor hermeticity of the dento-prosthetic joint is always possible and very often facilitates the accumulation of the dental plaque at the origin of the carious recurrence.

The bacterial infiltration then causes a weakening of the dental stump, as well as the decohesion of the dental cement. It is therefore necessary to remove the crown to perform the care, remake a crown and thus succeed in keeping the tooth as long as possible (fig.15,16).

![Fig.15](image)

**Fig.15** Recurrence of caries under prosthetic ...

![Fig.16](image)

**Fig.16** Requires removal and completion of a new restoration.

**The fracture of teeth**

This is one of the main reasons for removal in fixed prosthesis. These fractures and cracks can be consecutive to a traumatism of the teeth, caused by a shock, a repeated mechanical stress (as in the patient bruxomane) or sometimes in the normal conditions of mastication following the rupture of roots too weakened by the previous treatments, and this is unrelated to the seniority of the prosthesis (fig.17,18,19).

![Fig.17](image)

**Fig.17** Metal-ceramic bridge replacing the 11.

Dental fractures are related to the types of crown and root reconstructions used (metallic or resin) MARTINEZ A. et al. [14], have shown that dental fractures are more numerous with
crown and root (metallic) reconstructions than with carbon fiber posts associated with a composite.

![Fig 18 The pillar's fracture of 12.](image)

If this fracture is located at the junction between the post and the pillar, removal of the anchor is possible depending on its situation through different techniques: Masserman kit, Gonon extractor.

On the other hand, if one has a root fracture, this leads almost systematically to the extraction of the tooth. But before we get there it is necessary to determine whether the tooth cannot undergo a hemisection or a root amputation especially when it is a strategic tooth.

**Aesthetic Etiologies [15,16,17,18,7]**

Aesthetics has a part of subjectivity specific to each, but there are still a number of objective criteria that must be respected to promote successful integration of the prosthesis into the oral cavity (fig.20).

**Failures related to a periodontal problem (fig.21,22)**

The aesthetic integration of a fixed prosthesis is not conceivable out of the periodontal context. The position of the free edge of the marginal gingiva, its volume and color have an aesthetic impact all the more marked as they appear upon smiling.

![Fig 20 Periodontal inflammation with absence of embrasures.](image)

Gingival recessions and gingival hyperplasia are important unsightly factors in the removal of an overactive prosthesis, particularly in the presence of a gummy smile.

**The aesthetic failures strictly speaking**

- Disharmony of form and arrangement;
- Disharmony of the gingival line;
- Asymmetry in relation to the median line;
- Cervical darkening;
• Failure of the color.

Many other reasons to remove restorations that have become inadequate:
• Replace crowns with matt resin vestibular encrustation with more aesthetic ceramics (fig. 23);
• Also consider the change of a metal-ceramic crown by an all-ceramic crown.

CONCLUSION

In fixed prosthese, the failures are particularly heavy consequences and can intervene at all levels involved for these restorations. They can occur immediately after prosthesis placement or appear again later. These failures can be of types: periodontal, endodontic, esthetic, prosthetic or functional.

Any failure requires reintervention; the latter still does not want to say the removal of the prosthetic element but it may be a repair of the prosthesis in the mouth.

For this reason the therapeutic decision will be made after a careful and precise clinical and radiological examination while trying to answer the wishes of the patient.

Références

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