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CASE REPORT

Treatment of a Case of Subtotal Maxillary Edentulism by Composite Prosthesis

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ABSTRACT

In the subtotally edentulous, facing the last remaining teeth, the practitioner may be faced with a dilemma: "Keep or extract". Of course the answer is not always obvious, it must take into consideration several parameters.

When the practitioner decides to keep the residual teeth, he can consider, depending on the case, the implant solution, the supra-radicular prosthesis or the composite prosthesis.

In this article we present a case of maxillary subtotal edentulism treated by the composite prosthesis.

The choice of this therapy was based on a diagnostic approach leading to the manufacture of temporary prostheses that were re-evaluated over six months, then a definitive prosthesis made according to the rules of art, giving the patient a suitable smile and optimal comfort during mastication.

KEYWORDS: Subtotal Edentulism - Composite Prosthesis - Milled Crowns - Removable Prosthesis.

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INTRODUCTION

Subtotal edentulism is a partial edentulism in which one to four residual teeth remain. The preservation on the arch of few and isolated dental organs presents an obvious interest, the implant option would be very relevant, insofar as it offers an alternative to the conventional total prosthesis, by bringing complementary means of retention, or the supra-radicular prosthesis (2), with or without retention means, in cases where the teeth are reduced to root stumps, in addition, composite prosthesis is possible with milled crowns with or without attachment, however, in some complex cases, the few saved teeth can make the therapeutic decision difficult.

Mesio-distal prosthetic space between 13 and 23 width = 34 mm

Reduced prosthetic space between 23 and 25 because of the mesio-version of the 25

Anterior maxillary crest without bone defects

Posterior maxillary crest of sufficient height

Firm and adherent covering mucous membrane

Completely toothless mandibular arch (Class I of Sangiuolo).

CLINICAL CASE :

• **Reason of consult :**

Restoring lost facial aesthetics and masticatory function

• **Local anamnesis:**

Several teeth have been extracted in the root canal due to carious complications.

Extraction of the 11, 12 and 21 teeth following their expulsion due to trauma (fall down the stairs).

• **Endobuccal examination:** (figure 1)

Average Hygiene

Saliva of normal quantity and viscous quality

Plane of occlusion disturbed by the 17 eruption

Sufficient vertical prosthetic space



Fig. 1 : Endobuccal views

***Dental and periodontal examination:**

Generalized caries
 Healthy mucous membrane
 Absence of bleeding
 No mobility

Recessions

17	8 / V, 7 / P
13	3 / V, 3 / P
23	2 / V
25	2 / V, 2 / P

Height of the keratinized gum

17	4 mm
13	11 mm
23	9 mm
25	7 mm

Periodontal Survey

	17	13	23	25
DV	4	3	3	3
CV	5/FA	2	3	4
MV	3	3	3	2
MP	4	3	3	3
CP	5	3	3	3
DP	6	4	2	3

-Aesthetic examination: (figure 2)

Oval-shaped face
 Brown Teguments
 Absence of scars
 Marked nasolabial folds
 Flat profile and nasolabial angle = 90°
 Vertical dimension of physiological rest = 76 mm
 Rectilinear opening/closing path.

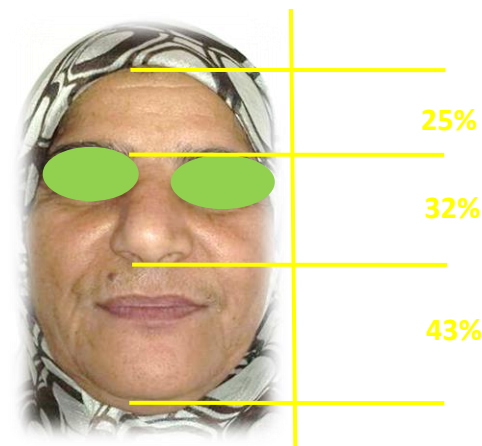


Fig.2 : Front view

-Radiological examination: (figure 3)

Normal-looking noble anatomical structures.
 17: bone resorption at the 1/3 apical level, clinical crown/root ratio > 1
 13, 23: bone resorption in the middle 1/3, clinical crown/root ratio = 1
 25: Mean bone resorption, oblique coronary-radicular axis, clinical crown to clinical root ratio =1

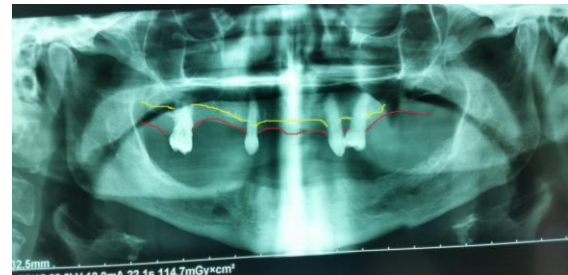


Fig.3 : Panoramic Radiograph
 a- alveolar bone line b- keratinized gum line

Diagnosis:

This is Mrs. D.K., age 50, presenting:
 Insulin-dependent diabetes stabilized on treatment
 Deep dentinite at 13, 23 and 25
 Necrosis of the 17
 Maxillary subtotal edentulism
 Total mandibular edentulism

Therapeutic Decision :

Hygiene motivation
 Extraction of the 17
 Endodontic treatments on 13, 23 and 25
 Composite maxillary prosthesis :
 * maxillary bridge with milled buccal inlay crowns replacing 11, 21, 22 and 24.
 * cast partial denture replacing 14, 15, 16, 17, 25, 26 et 27

- Conventional total mandibular prosthesis
 The rehabilitation will be carried out according to the concept of the balanced occlusion.

-The Therapeutic Project :

* **Diagnostic Models :** fabrication of the maxillary anterior provisional bridge, the temporary removable maxillary prosthesis and the provisional total mandibular prosthesis (figure 4)

The provisional bridge is cemented and the polymerized directing assembly is put in the mouth.



Fig.4 : Diagnostic Models

*** Prospective layout of the cast removable prosthesis (figure5) :**

Conversion from a subtotally edentulous maxilla to a partially edentulous Kennedy CI I.
Palatine shoulders on 13, 23 and 24.
Milling of the cingulate bar
Nally Martinet hooks on 13 and 24



Fig.5 : Plate Pattern

*** Validation of the prosthetic project :**

Six months later, we evaluated:

- the patient's hygiene
- the temporary bridge and the quality of temporary removable prostheses
- the occlusion context
- the periodontal support of the abutment teeth
- oral functions and aesthetics

The final mandibular total denture was fabricated during this phase.

The parameters evaluated are validated and the patient demonstrates her satisfaction.

*** Treatment : (figure 6)**

- Preparation of abutment teeth
- Impression of the metal framework of the bridge
- Choice of the shade of the ceramic through that of the resin prosthetic teeth chosen for the total mandibular prosthesis and the cast partial denture
- Final cementation of the milled bridge after trying
- Maxillary secondary impression for metal frames, using an individual impression tray
- Trying the metal framework in the mouth and taking the inter-maxillary ratio in centered relation and maintaining the vertical dimension of the validated occlusion during the provisional phase
- Putting the cast partial definitive denture after validation (figure 7)
- Occluso-prosthetic balancing sessions have been scheduled

- Follow-up and maintenance :

A schedule of check-up appointments has been respected in order to re-evaluate our treatment.

The treatment has lasted from then to now, from 2016 to today, without demonstrating any periodontal, aesthetic or functional problems. The prognosis is considered good after 4 years.



Fig.6 : composite prosthesis



Fig.7 : Patient's Satisfaction

DISCUSSION

The choice of therapy for subtotal edentulous patients is complex. And although tooth preservation is a fundamental principle in dentistry, the preservation of few teeth must be thought about.

Keeping teeth can prevent a patient who has lost almost all of his teeth from becoming completely edentulous.

Several decision parameters are to be taken into consideration :

1-Patient-Related Parameters :

His desires, his physical and mental state of health, his level of hygiene, his financial possibilities, his aesthetic demands and his social and family environment.

2-Parameters related to his dental condition (3) :

- **The arch to be restored :**

Depending on whether the maxilla or the mandible is addressed, the esthetic objectives are not the same and the bio-mechanical problems are not the same either. Since the lower teeth are concealed by the lower lip, there is less aesthetic concern about the visibility of the clasps (4, 2). In fact, the esthetic demand is more present in the maxilla and the use of a composite prosthesis combining milled crowns and a partial cast partial denture avoids the visibility of the clasps and ensures the continuity of the

dental corridor and a natural smile. On the other hand, prosthetic balance would require the use of additional retention on tooth stumps or roots (5, 6).

- **The antagonistic arch :**

The nature of the antagonist arch determines the occlusal pattern to be established, by the search for occlusal contacts of the same nature at least a uniform and precise distribution of the latter when they are of different natures. In the case of a completely edentulous arch, we must re-establish a bilaterally balanced occlusion.

- **Dental condition :**

Cavities : Caries of the enamel, dentin or cementum are not uncommon on residual teeth. Thus, the practitioner must evaluate the importance of these lesions, which may require endodontic treatment or extractions.

Wear, abrasions, attritions, erosions and myololysis: are frequently observed on residual teeth, and in their advanced stages may require endodontic therapy or avulsion.

Endodontic treatments: must meet the quality criteria required for endodontic treatment, otherwise a repeat treatment is indispensable.

Coronary or corono-radicular reconstructions: their orientation must respect the axis of insertion and disinsertion of the partial denture and their preparation must foresee the volumes of the occlusal supports, wedge or retention arms and indirect supports, which can be invested in the so-called milled crowns.

Malpositions, eruptions, versions and rotations : are the indications for milled crowns in order to favour the balance of the cast partial denture.

- **The Topography of the Remaining Teeth :**

The rather symmetrical bilateral positioning of the teeth is a factor in decision making. We then speak of strategic teeth necessary for the biomechanical balance of the prosthesis. In addition, the space between the remaining teeth plays an important role in this decision.

3- Parameters Related to its Periodontal State:

Any prosthetic treatment must be envisaged on teeth whose periodontal support is sufficient and free of any inflammatory or infectious sign, from where the importance to control the oral hygiene of the patient, only guarantor of the perennality of the prosthetic therapy.

- **The Marginal Gingiva :**

Around the tooth must be healthy, of normal contour, non-inflammatory and light pink in color. The height of the attached and keratinized gingiva must be at least 4 mm.

- **Periodontal Pockets:**

Should not appear when probing after sanitation.

- **The clinical crown/clinical root ratio:**

Is a determining factor in the choice of treatment decision. Being greater than or equal to 1 it is favourable for a fixed reconstitution.

- **The State of the Toothless Crests :**

The volume of the toothless crests must be sufficient. A collapsed or irregular crest, especially at the anterior superior level, can limit the choice of conservation of the teeth to make a fixed or implant-supported prosthesis. The adhesion of the overlying mucosa to the underlying bone must be satisfactory, providing good support for the future prosthesis.

4- Occlusal Parameters :

- **Skeletal ratios:**

exaggerated skeletal class II and III cases are difficult situations that complicate prosthetic treatment.

- **The Vertical Dimension of Occlusion:**

when the residual teeth maintain an underestimated vertical dimension affecting the facial aesthetics of the patient, and reducing the vertical prosthetic space necessary for the assembly of the teeth, coronoplasty is necessary.

The rigorous study of the case by evaluating all these parameters makes it possible to take the most appropriate, least restrictive and most sustainable therapeutic decision. Keeping teeth with a reserved prognosis can lead to : (Abrams, 1980).

Significant tissue loss.

Alveolar collapse.

Limited treatment options.

Increased treatment duration.

Compromised final result.

Several surgical steps should be considered to reconstruct an appropriate alveolar morphology (hard and soft tissues) (Davarpanah et al., 1993).

Besides the composite prosthesis, other therapeutic proposals are possible to treat a case of subtotal edentulism:

Transition prosthesis.

The supra-radicular prosthesis.

Conventional total prosthesis.

The supra-implant prosthesis.

The treatment of these cases has greatly evolved thanks to the development of fixed and removable implant prosthesis techniques, to highlight their advantages in terms of benefit, safety and prognosis.

CONCLUSION

The choice of therapy in the subtotal edentulous is complex. And although the preservation of natural teeth is a fundamental principle in dentistry, the preservation of few teeth must be considered. Currently, the treatment of these cases has evolved greatly thanks to the development of fixed and removable implant prosthetic techniques, to show their advantages in terms of benefit, safety and prognosis

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AUTHORS' CONTRIBUTIONS

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COMPETING INTERESTS

The authors declare no competing interests with this case.

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PATIENTS CONSENT

Written informed consents were obtained from the patient for the publication of this case report.

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