



## RESEARCH ARTICLE

### THE USUAL OBTURATOR PROSTHESIS: ABOUT A CLINICAL CASE

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#### ABSTRACT

Maxillary substance loss offers a variety of anatomical and functional deficits that significantly influence the performance of maneuvering functions. Restoring substance loss after maxillectomy is a real challenge. Thus, despite the evolution of surgical techniques and the rise of microsurgery, the conventional obturator prosthesis still occupies a considerable place in the management of these patients. In this article, the authors propose to describe this prosthesis and to illustrate it with a clinical case.

## INTRODUCTION

Prosthetic rehabilitation of maxillary substance loss corresponds to the placement of an obturator prosthesis in the cavity generated by the maxillectomy, in order to close the oral-naso-sinus communication resulting from carcinological, traumatological, infectious, congenital or iatrogenic removal surgery. This equipment is essential from a functional, aesthetic and psychological point of view, and the quality of this reconstruction will directly depend on the patient's quality of life (Benoist, 1975, 1978; Giumelli et al., 2000; Lalire, 1997; Margainaud, 2001).

### General conditions

#### Roles of the maxillofacial obturator prosthesis (Keyf, 2001)

According to KEYF, the main functions of the obturator prosthesis are:

- To allow feeding by reducing the reflux problem
- To improve chewing, swallowing, and speech functions
- To allow the operated site to heal in better circumstances
- To help rebuild the palatal contour and/or soft palate
- To maintain surgical dressings
- To reduce postoperative bleeding, thus preventing the formation of haematoma
- To improve lip and cheek support and to benefit the patient's morale.

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#### Description of the maxillofacial obturator prostheses used (Muster et al., 1999; Voreaux and Amans, 1985):

The obturator prosthesis consists of two parts: a metal or resin palatal plate with prosthetic teeth, and an obturator itself which will be made of hard resin or soft material. This obturator may or may not be integral with the palatal plate. Rigid resin plugs are used in patients with toothed teeth or with a small loss of substance. They are fixed to the plate and can be hollowed out to be as light as possible, with or without a hole. Silicone or soft resin, known as soft, are indicated for total or subtotal edentulous patients to relieve remaining teeth, or for large loss of substance. The connection between the obturator and the plate is made by a sensor-magnet system. Hard resin plugs can be relined with these flexible materials to increase their tightness and improve patient comfort. Hard resin plugs have the advantage of being cheaper, simple to make, easy to relin and maintain, but are less comfortable for patients and require a sufficient mouth opening for insertion. The soft ones are more waterproof, more comfortable and can be introduced in patients with limited mouth opening. Their major disadvantages are the rapid ageing of the material, its bacterial colonisation and its non-evolutionary nature due to the impossibility of relining. Depending on whether or not this obturator is attached to the palatal plate, we speak of a monoblock or stepped prosthesis. Generally speaking, when possible, monoblock prostheses are preferred because they are more functional and easier to use by patients than the ever more complex multi-storey prostheses. However, the stepped prosthesis allows a two-stage insertion compatible with a limited oral opening and large substance losses or associated with facial epithetics.

### **Advantages and disadvantages of the maxillofacial obturator prosthesis**

The advantages of rehabilitation by obturator prosthesis are the speed of completion and the ease of oncological monitoring, by maintaining direct visual access to the margins of excision. Thus, at the slightest doubt, the patient's referral to his surgeon is mandatory. The disadvantages lie in the removable nature of these devices and the need for strict hygiene of both the prosthesis and the excision cavity. In addition to this, stepped prostheses present the difficulty of placing in the mouth, especially in elderly or less severely affected patients. Finally, repeated insertion-desinsertion, especially of an unsuitable obturator prosthesis, can lead to irritation of the margins of substance loss, which can lead to local recurrences.

### **Prognosis and follow-up**

The prognosis of the obturator prosthesis depends on the size of the loss of substance, the remaining teeth on the arch, the time when the patient is referred to the prosthesis specialist by his surgeon and the economical and especially psychological profile of the patient. Regular follow-up after insertion should make it possible to detect and manage any postoperative complications, and requires:

- Oral hygiene control
- Late occlusal equilibration
- Rehabilitation of the obturator in the event of loss of tightness or ageing of the material
- Clinical control by inspection and palpation of the excision cavity to detect inflammation, ulceration, pain or bleeding and to make an accurate diagnosis.
- Psychological support for the patient and his or her family and friends for a better psychosocial integration.
- Collaboration between prosthesis specialist and surgeon is essential to manage any recurrence situation as quickly as possible.



**Figure 1. Endobuccal view of substance loss**



**Figure 2: Static occlusion view**

### **Clinical case**

#### **Clinical examination**

Mr X, 21 years old, partially edentulous, was referred by his maxillofacial surgeon for the prosthetic rehabilitation of maxillary substance loss. The patient was received several months after the removal of squamous cell carcinoma in the right hemi-maxillary.

At the first consultation, we noticed:

- Speech difficulties with incomprehensible speech that complicates communication with others.
- A psyche affected due to its suffering following its painful surgical and medical therapeutic past and especially to the alteration of all functions: phonation and feeding with nasal discharge during meals.

On the endobuccal examination, we note:

- The presence of partial maxillary edema by the absence of 15, 16 and 17, associated with a loss of class IIB substance according to the DEVAUCHELLE classification, and a completely toothed mandibular arch.
- Slight inflammation at the lateral limits of the cavity (Fig. 1)
- An average limitation of the mouth opening
- In static occlusion: absence of anterior and posterior overlap with Cuspid/Cuspid posterior contacts (Fig. 2)
- The radiological examination shows (Fig. 3):
- Osteosynthesis plates at the maxillary level placed after Lefort 1 surgery
- Absence of the image of the right hemi-maxillary.

#### **Therapeutic objectives**

Respond to the patient's reason for consultation:



Figure 3. Panoramic radiograph

- Rehabilitate the loss of substance
- Restore the functions: phonation and power supply

Maintain the periodontal health of the remaining teeth  
Manage occlusion and maintain neuro-musculo-articular balance

#### Therapeutic approach

- Motivation for oral hygiene and periodontal rehabilitation
- Occlusal equilibration (Fig. 4):

After occlusal balancing in the mouth, we were able to have:

**Statically:** anterior and posterior coverage of the mandibular teeth by the jaw teeth and posterior cuspid/fosse and cuspid/embrasure contacts.

**In dynamics:** a functional front guide in propulsion without posterior contacts and a canine function in right and left training.

-Musculo-articular rehabilitation for 20 days :

**Massotherapy:** endo and exo-oral massage of the cheeks, on either side of the Masseters, between the thumb inside and the index finger and middle finger outside and bilaterally.



Figure 4. Static occlusion after occlusal equilibration of the natural teeth

#### Exercises

**Scissor technique:** the patient is led to put the thumb at the level of the free edges of the central maxillary incisors and the index finger at the level of the mandibular ones, then ensures an opening movement by applying downward pressure on the mandible.

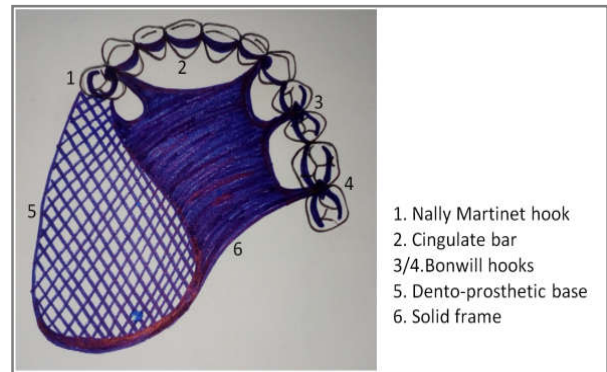


Figure 5. Layout of the metal frame

**Tongue depressor technique:** during the first consultation, only 12 tongue depressors could be introduced into the mouth, and on the 20th day 20 tongue depressors could be introduced. At the end of the rehabilitation phase, the amplitude of the buccal opening was considerably increased from 20mm to 33mm.

#### Prosthetic phase

The maxillary study model, resulting from a preliminary impression, was studied on a parallelizer and the prospective layout of the metal frame was established (Fig. 5) and the actual prosthetic steps were started. We decided to use a tray frame for the secondary impression. Thus, we carried out the dental preparations according to the prospective outline already established and an alginate impression with a commercial impression holder was taken (Fig. 6). The impression tray frame is made in the laboratory from the primary model (Fig. 7). We then decided to take an ambulatory impression of the loss of substance at the Fitt de Kerr and the patient is seen again 48 hours later, so that the material reaches its maximum elasticity stage and the patient is comfortable during speech and during meals. This impression is then dried and filled with an Impregum-type polyether, and then introduced into the mouth so that the elements of the metal frame perfectly recover their counterparts. The patient is asked to close with maximum intercuspid occlusion and perform all physiological movements to register the free play of the para-prosthetic organs and close with occlusion until the





Figure 6. Alginate impression after tooth preparation, for the production of the impression frame



Figure 7. Impression frame

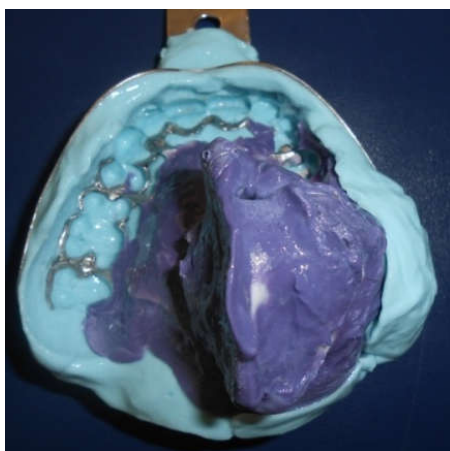


Figure 8. Secondary impression



Figure 9: Polymerization of the obturator prosthesis



Figure 10. Relining the obturator with Soft Liner resin



Figure 11. Placement of the obturator prosthesis in the mouth and patient satisfaction with the result of the treatment

polymerization of the impression material has been completed. At this time, a global impression of the frame in place is being taken with alginate and a commercial metal tray. The secondary impression is then removed after gelation, rinsed and disinfected (Fig. 8). The correct recording of the underside and contours of the loss of substance is noted. It is then sent to the laboratory for casting. On the secondary model, a wax occlusion model was made which served as an occlusion support for the intermaxillary ratio.

The assembly of the three missing teeth is carried out, then tested and validated in the mouth. The polymerized prosthesis has an obturator part that integrates into the loss of substance without interference (Fig. 9). The compression and over-extension areas identified were removed with a low-viscosity silicone and the plug is then relined with a soft Soft Liner resin (Fig. 10). The final obturator perfectly follows the contours of the loss of substance with slight undercuts at the internal and posterior levels to allow the insertion of the prosthesis along an oblique axis from bottom to top from right to left and from front to back. The prosthesis is placed in a conventional way by adjusting the occlusion. At the end of the insertion the tightness of the obturator was checked by asking the patient to drink water with the head bent forward and checking the phonation by the correct pronunciation of the constrictive (S, CH) and explosive (P, B) consonants. The patient shows satisfaction with the rehabilitation offered (Fig. 11). Finally, we instructed the patient in the hygiene of his prosthesis, teeth and mucous membranes and a check-up appointment booklet every 6 months was delivered to him for the renewal of the Softliner resin and for the occlusal and functional follow-up of the obturator prosthesis.

## Conclusion

Maxillary substance losses, depending on their extent, connect the oral cavity and surrounding sinus cavities. The anatomical, functional, aesthetic and psychological damage caused by maxillectomy must be corrected to allow the patient to regain orofacial functions and return to his or her social environment.

Maxillofacial prosthesis is still relevant despite the progress in plastic reconstructive surgery, especially with the current evolution of implantology, which makes it possible to improve the results obtained and the comfort of patients.

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