

Immediate Surgical Obturator Prosthesis: Case Report

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ABSTRACT

Resection of the maxilla often results in severe functional, aesthetic, and psychological sequelae. This loss of substance creates breaches that can extend throughout the palatal vault, affecting the maxillary sinus, the nasal cavities, the floor of the orbit, and even the orbital cavities.

The prosthetic management of these patients is in fact a complex task involving several immediate, secondary, and definitive stages. The transition from one stage to the next depends on a number of factors, including the post-surgical follow-up and the stage of healing.

This article discusses, through a case report, the importance of the immediate obturator in preventing post-operative complications and its role in protecting the surgical site during the initial healing period.

Keywords: Immediate obturator; immediate surgical obturator prosthesis; maxillectomy.

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I. INTRODUCTION

Despite advances in reconstructive surgery, obturator prosthesis remains the preferred rehabilitation method for most maxillectomy defects [1]. Partial or total maxillectomies often result in bucco-nasal, bucco-sinusal or bucco-naso-sinusal communication, with nasal food reflux associated with mastication and phonation problems [2].

All of these functional and anatomical changes affect the patient's quality of life. Surgical or prosthetic reconstruction is required to restore the defects caused by resectional surgery. However, surgical reconstruction is not always possible due to the high risk of tumour recurrence and necrosis of the reconstruction flap following radiotherapy and/or chemotherapy [3].

If the surgeon and the maxillofacial prosthodontist collaborate in a pre-operative consultation, immediate prosthetic treatment can be organised.

An immediate obturator is an important step in improving post-operative progress; otherwise the only option is to insert a nasogastric tube to ensure nutrition. Also known as a surgical obturator, this prosthesis is inserted immediately after maxillary resection, in the operating room [4]. It consists of a resin palatal plate with an obturator that the patient uses 2 to 3 weeks before the secondary prosthesis [4]. A multidisciplinary consultation, including the surgeon, dentist and dental laboratory technician, is essential prior to surgery, to prepare a medical report, take dental arch impressions and

determine the edges of the tumor removal.

The surgical obturator offers a wide range of advantages. It facilitates feeding by enabling early removal of the nasogastric tube, improves the patient's ability to speak by restoring normal palatal contours, and prevents wound contamination thus reducing the risk of infection [5]. If the patient is concerned about aesthetics, anterior prosthetic teeth can be fitted to give the patient a psychologically acceptable face. The immediate plate thus reduces the psychological impact of surgery by improving post-operative recovery [5].

The immediate obturator prosthesis usually consists of 2 parts: a palatal plate that reproduces the palatal contours combined with an obturator that fills the substance loss.

The palatal plate should be a simple, transparent acrylic palatal plate to allow post-operative examination of the exeresis site. Alternatively, if the patient already has prosthesis, it can be modified and adapted to the new post-operative situation. The obturator can be made of a high-viscosity silicone recommended for large substance losses because it is easy to place and resistant to ageing and discoloration. Its advantage is that it can be pre-sterilised, thus avoiding possible contamination of the surgical site [6]. Conditioning resins can also be used per operatively for small to medium substance losses. As they can be relined, corrections and additions can be made. Their elasticity and texture make them comfortable for the patient. However, their limited durability means that they must be changed periodically.

If time is a constraint, another type of surgical obturator can be fabricated that does not require preoperative impressions. In this case, a high-viscosity silicone ball is molded to the shape and contours of the substance lost immediately after surgery [4].

II. CASE REPORT

A 60-year-old female patient was referred to the Department of Removable and Maxillofacial Prosthodontics of the University Hospital Center Casablanca-Morocco for a pre-surgical consultation. The patient reported severe nocturnal pain in the left side of the maxilla, and severe discomfort when eating and speaking due to the presence of a mass on the palate.

Endo-buccal examination revealed a completely edentulous jaw, with a 3 to 4 cm cauliflower-like tumor in the left maxillary alveolus (Fig. 1). The lesion was immobile, adherent and very painful and bleeding on palpation. The clinical appearance was suggestive of malignancy.



Fig. 1. Endobuccal view showing left maxillary lesion.

Anatomopathological examination of the biopsy showed a squamous cell carcinoma.

Preoperative multidisciplinary consultation is very important. The general treatment plan must be studied and discussed by the surgeon, the prosthodontist, and the dental laboratory technician. The prosthodontist discusses with the surgeon the surgery margins of resection, the type of prosthesis planned, and the support points desired to ensure its stability.

The use of an immediate surgical obturator was decided. Securing this type of obturator for the edentulous patient requires use of sutures into the surrounding mucosa, bone screw, or circumzygomatic wires. The procedures needed to fabricate the surgical obturator are identical.

An alginate impression (Fig. 2) was taken with a standard impression tray and cast with hard plaster (Fig. 3).



Fig. 2. Alginate impression.

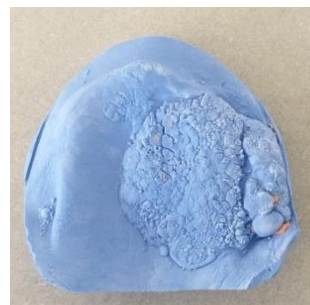


Fig. 3. Plaster model with tumor bulk in left maxilla.

The surgeon drew the margins of the resection. These borders are always imprecise, but the important thing is to identify with certainty the edges of the tumoral mass whose resection is certain. (Fig. 4). The tumor bulk present on the alveolus and hard palate was reduced to normal contour (Fig. 5). The prosthesis was then fabricated with autopolymerizing resin. Its borders extension was identical to a complete denture. Retention clasps were fixed to the intrados of the plate to secure the obturator in the surgical cavity using autopolymerising resin. Surgical resection of the tumour was performed by the maxillo-facial surgeon (Fig. 6).

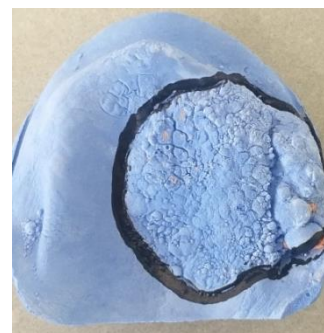


Fig. 4. Identification of the boundaries of tissue loss.



Fig. 5. Preparation of the model for the fabrication of the palatal plate.

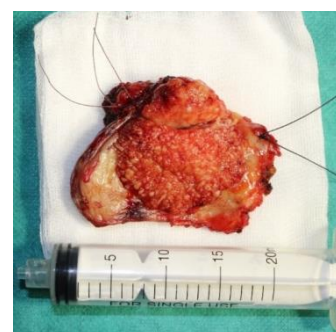


Fig. 6. Surgical specimen.

At the end of the surgery, a pre-sterilised silicone mass was prepared according to the defect size and packed into the resection cavity with minimal pressure. The resin plate was then placed and the retention elements must penetrate the silicone paste before it polymerises.

Once the silicone has polymerised, the plate-obturators was removed, washed in saline and retouched with a scalpel. Unnecessary parts were removed and edges regularised. The obturator is then covered with a layer of antibiotic cream and placed back in the mouth.

Due to the limited anatomical retention sites, the surgical obturator was stabilised by transosseous screws allowing a good oro-nasal separation (Fig. 7).



Fig. 7. Palatal plate with silicone obturator.

The obturator was left in the mouth for a week to avoid the pain on insertion and removal, to accelerate the healing and to facilitate feeding. After one week, the silicone obturator was removed (Fig. 8) the resection cavity was examined and cleaned and the good vascularization was noticed (Fig. 9).



Fig. 8. Silicone obturator was removed after one week.

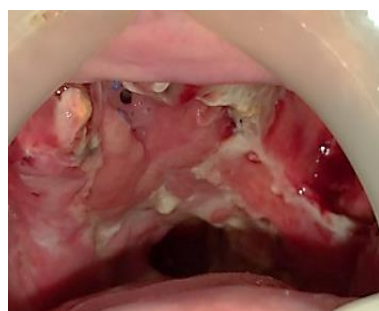


Fig. 9. Intraoral image showing the appearance of the defect after one week.

The aim of this session was to make the necessary corrections to the obturator, eliminating overextensions and compressions that cause discomfort or pain. As it is not possible to relined the silicone, it was decided to replace it with

tissue conditioner to ensure continuity of the healing process (Fig. 11).



Fig. 10. Relining of the palatal plate using tissue conditioner.

Due to its elastic properties and the possibility of relining, tissue conditioning resin is considered the material of choice to improve the health of soft tissue around the defect area. The patient was then seen weekly during the healing period. During each session, the surgical site was carefully examined to check for changes in the resection cavity and the prosthesis was adjusted and relined.

After 3 weeks, (Fig. 11), secondary obturator prosthesis was made. This was a functional prosthesis with prosthetic teeth (Fig. 12) to guide the healing process and improve the patient's function and aesthetics.



Fig. 11. Endo-oral view after healing.



Fig. 12. Placement of the secondary obturator prosthesis in the mouth.
a: endo-buccal view; b: exo-oral.

III. DISCUSSION

Resection of a tumour in the maxilla often leaves a loss of tissue that can be of infinite variety in shape, size and location. This diversity often leads to complexity in the treatment plan, as management must be personalised and individualised according to the characteristics of each situation [7]. A detailed study of the case is necessary: the characteristics of the surgical defect, the state of the remaining dental structures, the complementary treatment methods (radiotherapy, chemotherapy, etc.), and their repercussions on the oral cavity must be recorded and

analysed in order to establish an overall assessment of the case and to guide the treatment.

Radiotherapy often leaves quite severe after-effects that have a negative impact on the prosthetic prognosis. Muscular atrophy and fibrosis are often observed, resulting in limited mouth opening. Prosthetic treatment in this case must be preceded by sessions of maxillofacial physiotherapy to facilitate impressions taking and dentures insertion. There is also a reduction in salivary flow, which increases post-radiation caries and weakens the teeth that will support the prosthesis. Ideally, the patient should visit the dentist before the radiotherapy sessions to clean the oral cavity and carry out preventive treatment by applying fluoride via splints. The treatment of patients who have undergone tumour resection is a team effort, and a multidisciplinary consultation with the entire medical and paramedic staff involved (surgeon, oncologist-radiotherapist, maxillofacial prosthodontist, psychologist, etc.) must be organised periodically to discuss the different treatment methods, with the common aim of improving the patient's quality of life and ensuring his or her social integration by restoring function and a normal aesthetic appearance.

The treatment of choice to restore the integrity or continuity of affected structures after resection is reconstructive surgery. Defects can be repaired using fasciocutaneous or bone-containing free flaps or local advancement flaps [8]. However, surgeons are limited by tissue availability, the need to minimise morbidity at the flap donor site, the possible compromise of the local vascular bed, the need for regular oncological control, the relatively high risk of recurrence and the physical condition of the patient [9].

When surgical reconstruction is not possible, prosthetic rehabilitation is the treatment of choice to restore the integrity or continuity of the affected structures after resection. Rehabilitation of these deficits should ideally involve three phases [10]:

- Immediate treatment with a surgical obturator placed in the mouth intraoperatively.
- Design of a secondary temporary prosthesis to ensure function and esthetics during the healing period.
- A definitive obturator prosthesis designed when healing is considered complete.

An immediate obturator, also known as a surgical obturator, is the first stage in the prosthetic chain of a maxillofacial obturator prosthesis. It is fabricated prior to resection surgery and placed in the mouth intraoperatively.

Although its design is simple, its role is crucial in improving post-operative recovery. Functions such as eating, swallowing and speaking are greatly improved. In the immediate postoperative period, the patient can eat by mouth and communicate with understandable speech [11], [12].

The use of an immediate obturator is far preferable to the use of a compress in the surgical cavity. The daily changing of compress is a source of pain, bleeding and bad breath.

However, planning for immediate treatment requires close collaboration with the surgical team. The choice of material and means of retention must be discussed beforehand.

After tumour resection with persistence of dental structures, as in the case of an Aramany class III, retention can be ensured with metal clasps. On the opposite, if the patient was

totally edentulous before surgery or if a total maxillary resection has been performed, other means of retention must be considered to ensure good prosthetic stability.

Retention in this case can be established using palatal bone screws, screw-shaped titanium implants, sutures in the surrounding mucosa and suspension wires such as circumzygomaticwires [13]. In cases of very extensive substance loss with bone atrophy preventing immediate insertion of implants or transosseous screws, a craniofacial wiring suspension technique used in "Le Fort" fractures can be used to ensure retention and stability of the immediate obturator [13].

In this case we opted for a transparent single plate obturator with a high viscosity silicone obturator. Retention was provided by two transosseous screws implanted in the residual right bony crest. No nasogastric tube was used postoperatively and semi-liquid feeding was possible due to the tightness of the obturator. The plate reproduced the contours of the palate, making the patient's speech intelligible. After 7 days, the plate was removed and the silicone was replaced with a conditioning resin, which was relined every 4 days throughout the fabrication of the secondary prosthesis, which is total obturator prosthesis, following the rules of conventional fabrication. The aim is to ensure optimal function and aesthetics, as well as social integration throughout the period of the final prosthesis.

IV. CONCLUSION

The immediate obturator should ideally be used in all patients undergoing maxillary resection surgery. It provides effective protection of the surgical site reduces the risk of infection and promotes rapid healing. In addition, the immediate obturator improves the patient's quality of life by restoring adequate nutrition and communication with family and friends.

CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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