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Obturator prostheses in post-oncological maxillofacial patients: our experience

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Abstract

Background: *Surgical procedures for tumors of the paranasal sinus, palatal epithelium, minor salivary glands or osteosarcoma of the upper jaw require a partial or total maxillectomy of the upper jaw. When the surgical procedure and/or radiation therapy result in a communication, the solution is necessarily prosthetical, through a palatal obturator that recreates a partition between the oral and nasal cavities.*
Methods: *Authors selected 32 post-oncological patients with the upper maxilla completely edentulous prosthetically rehabilitated with a palatal obturator.*
Results: *No serious complications or adverse reactions were reported during the fabrication of surgical or definitive obturators. All patients stated to benefit the palatal obturator in terms of quality of life.*
Conclusion: *Prosthetic rehabilitation of edentulous maxillectomy with oral communication is a demanding challenge for the prosthodontist. The goals of prosthetic rehabilitation include separation of oral and nasal cavities to allow adequate deglutition and articulation of teeth, restore midfacial soft tissue contour and a satisfactory esthetic outcome. When, for any reason, the patient is not a suitable candidate for an implant-retained overdenture, a total removable prosthesis should ensure the most comfort in terms of swallowing, phonation and aesthetics.*

Keywords: *Palatal obturator, oral cancer, quality of life, maxillofacial prosthesis.*

Introduction

Oropharyngeal cancer is among the main types of cancer in the head and neck region according to the World Health Organization, it may arise as a primary lesion originating in any of the tissues in the mouth, by metastasis from a distant site of origin, or by extension from a neighbouring anatomic structure.

Its treatment requires a multidisciplinary approach, involving the cooperation of different specialists, that follow the patient in the different steps of diagnosis, therapy and rehabilitation [1].

The surgical removal of the tumour is the most frequent treatment for patients with a malignant neoplasia and may be followed by a reconstructive phase, associated with radiotherapy and/or chemotherapy.

Surgical procedures for tumors of the paranasal sinus, palatal epithelium, minor salivary glands or osteosarcoma of the upper jaw require a partial or total maxillectomy of the upper jaw, that leads to large defects of the hard or soft palate caused by the removal of the cancerous tissues. The different reconstructive techniques have specific indications and advantages depending on the ablative defect, the medical status of the patient and the patient prognosis [2]. When possible, it is preferable to fill up the defect through a reconstruction of the resected tissues using vascularized free flaps [3]. Alternatively, local flaps can be used, but in this case, is higher the risk of a oro-nasal or oro-antral communication.

Moreover radiotherapy, not rarely associated with surgical treatment, may cause uncomfortable side effects, including osteoradionecrosis, mucositis, xerostomia and

damage of the salivary glands that may compromise both soft and hard tissues reconstruction and the consequent prosthetic rehabilitation [4].

Fig 1. The patient underwent a subtotal left maxillectomy for a squamos cell carcinoma, the surgical site was closed with local flaps. Extraoral view.

When the surgical procedure and/or radiation therapy result in a communication, the solution is necessarily prosthetical, through a palatal obturator that recreates a partition between the oral and nasal cavities; restores facial contour; improves mastication, articulation and speech intelligibility; and reduces drooping [5, 6, 7].

Prosthetic rehabilitation is essential to restore patient's capability to resume a normal working and social life [8, 9,10].

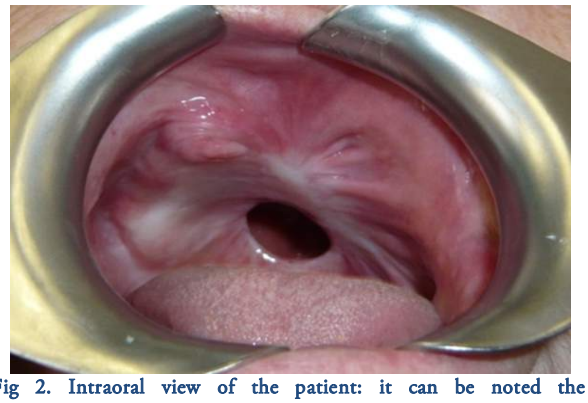

Fig 2. Intraoral view of the patient: it can be noted the comunication resulted from the surgical treatment.

The aim of this study is to present our experience in the prosthetic rehabilitation of maxillofacial post-oncological patients using obturator prostheses.

Materials and method

This study was open to all maxillofacial post-oncological patients that were prostethically rehabilitated using obturators prostheses at the Department of Head and Neck of "Sapienza" University of Rome, they all signed informed consent, according to the World Medical Association's Declaration of Helsinki and met specific inclusion and exclusion criteria.

All prosthetic rehabilitations were conducted from 2009 and 2013 and each obturator has completed at least 1 year of follow-up.

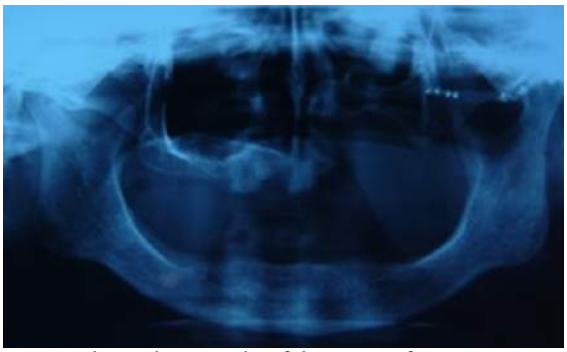

Fig 3. Orthopanthomography of the patient after surgery.

The Authors selected 32 patients meeting the following inclusion criteria:

- patients surgically treated for a tumor of the upper maxilla;
- patients reconstructed with local flaps;
- patients that after surgery resulted in an oro-nasal or oro-antral communication;
- patients with the upper maxilla completely edentulous;
- patients prosthetically rehabilitated with a palatal obturator;
- all patients had to be followed by the same dental team;
- patients with at least one year of follow-up after the delivery of the prosthesis.

The thirty-two patients enrolled in this study, 22 females (68,75%) and 10 males (31,25%) with a mean age of 54±25,45 years old (age range 22-76), were surgically treated for different types of oral tumor.

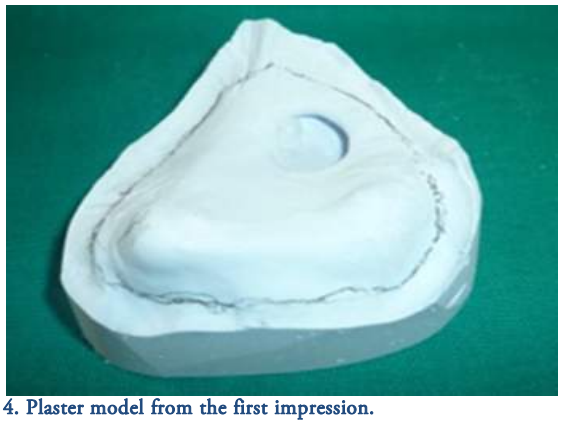

Fig 4. Plaster model from the first impression.

Medical history of osteosarcoma of the upper jaw was reported in eight patients (25%), four patients (12,5%) were treated for a unicystic ameloblastoma of the posterior maxilla, in six patients (19%) a malignant neoplasia of the paranasal sinus was diagnosed.

Of the remaining patients ten (31%) were treated for a squamous cell carcinoma of the hard palate and four (12,5%) for an adenoid cystic carcinoma of the same region.

Fig 5. Second functional impression.

Five patients (15,62%) underwent adjuvant radiotherapy: 45 Gy in 1.8 to 2 Gy fractions per day, five days a week.

All patients were examined and consulted before surgery, sequence of treatment was explained them and appropriate radiographs were obtained.

Results

Stone models of the maxillary arch and the anterior portion of the soft palate were obtained and obturator's size was determined by the surgical boundaries of the resection.

Fig 6. Extraoral view of the patient wearing the obturator superiorly and a total removable prosthesis inferiorly.

Thirty-two surgical obturators were fabricated to obtain an immediate coverage of palate defects and to enable patients to speak and swallow effectively immediately after surgery.

After healing of remaining tissues was completed, final obturators were projected.

No serious complications or adverse reactions were reported during the fabrication of surgical or definitive obturators.

Cumulative patients survival rate was 87,5% (n=28/32) to date, 4 patients (12,5%) died after the first year of follow-up.

Fig 7. Intraoral view.

All patients stated to benefit the palatal obturator in terms of quality of life.

Discussion

A stable obturator is an indispensable requirement for satisfactory functional and esthetic rehabilitation after maxillectomy for these patients [11]. Recent surveys have confirmed the efficacy of obturator prosthesis in terms of speech, masticatory function, swallowing and appearance [12].

There is evidence that the speech can be restored to a preoperative level with the palatal obturator [13].

Nevertheless, size of the maxillectomy defect showed to affect obturator function: patients often experience regurgitation of fluids or solids while drinking and eating and nasal voice, particularly when the defect is not well sealed by the prosthesis [14]. Common consequence of interventions of maxillary removal and closure with local flaps is the loss of the fornix, which causes instability of the prosthesis. Impression taking is a fundamental step when fabricating a removable prosthesis and even more so in these cases, where the oral anatomy is altered and the remaining structures must be exploited as much as possible [15].

Retention of the obturator is also difficult because of enhanced weight of the prosthesis and poor border seal associated with it. In these cases it would be useful the collaboration of the dental technician who can empty the internal heavier portions of the prosthesis.

Prosthetic rehabilitation of edentulous maxillectomy with oral communication is a demanding challenge for the prosthodontist [16].

The goals of prosthetic rehabilitation include separation of oral and nasal cavities to allow adequate deglutition and articulation of teeth, restore midfacial soft tissue contour and a satisfactory esthetic outcome [17].

When, for any reason, the patient is not a suitable candidate for an implant-retained overdenture [18 total removable prosthesis should ensure the most], a comfort in terms of swallowing, phonation and aesthetics.

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