

UNILATERAL JOINT AND MANDIBULAR RECONSTRUCTION ASSOCIATED WITH BIMAXILLARY ORTHOGNATHIC SURGERY AFTER SQUAMOUS CELL CARCINOMA RESECTION

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Received: 11/03/2020. Accept 12/13/2020

ABSTRACT

Squamous cell carcinoma is a type of cancer that can affect the head and neck, with high rates of mortality and morbidity. Its treatment can often be associated with permanent sequelae that bring psychosocial, functional, and aesthetic changes to the patient, significantly interfering with their self-esteem and quality of life. Technological development offers the possibility to carry out realistic and reliable virtual plans, as well as the possibility of developing customized prostheses for each case. The aim of this article is to report a case of highly complex joint and mandibular reconstruction, with satisfactory results, optimizing function and aesthetics.

KEYWORDS: Joint Prosthesis, orthognathic surgery, mandibular reconstruction.

1. INTRODUCTION

Squamous cell carcinoma (SCC) has a high mortality rate when it affects the head and neck region. Despite being extremely aggressive, the evolution in chemo and radiotherapy treatments associated with more effective surgical techniques has improved the survival rate of patients affected by this disease¹.

Neck dissection (ND) associated with tumor resection is the main surgical treatment modality. ND includes excision of regional lymph nodes and may or may not include removal of the internal jugular vein, accessory nerve, and sternocleidomastoid muscle².

Even when cured of SCC, patients can carry stigmas of the disease and its treatment, which can affect general and mental health, social life, employment, appearance, and can significantly change the patient's aerodigestive tract. Such factors have important impacts on the quality of life of these people¹.

To improve the quality of life of head and neck SCC victims, numerous treatments have been described. The joint prosthesis surgery associated with partial and total resections of the mandible was first documented around the 19th century. The evolution of the design and materials used, as well as the possibility

of using technology to make customized prostheses for each case have been important factors for the success of complex treatments³.

The aim of this article is to address a clinical case of a patient affected by malignant neoplasm in the head and neck region submitted to total resection of the hemimandible, discussing the reconstructive treatment to improve his quality of life after 18 years of living with the consequences of cancer.

2. CASE REPORT

A 53-year-old male patient sought the Oral and maxillofacial surgery service at hospital Ânima, presenting complaints regarding his reduced masticatory capacity associated with poor phonetics, unsatisfactory facial aesthetics, and snoring.

Upon initial evaluation, severe facial asymmetry was observed at the expense of hemimandibulectomy (right side), unstable occlusion of the prostheses on implants, maxillomandibular discrepancy, and after exams obstructive sleep apnea syndrome was also found.

The patient reported having been affected by SCC, diagnosed and treated 18 years ago with radio and chemotherapy associated with partial resection of the mandible and adjacent structures, as well as partial right neck dissection, without recurrences.

After performing a thorough analysis of the case, we proposed to the patient to perform a surgical procedure for total reconstruction of the temporomandibular and partial reconstruction of jaw joints with customized prostheses. For better aesthetic-functional rehabilitation, we decided to perform a bimaxillary orthognathic surgery procedure at the same surgical time.

We performed this procedure under general anesthesia, nasotracheal intubation, and started with orthognathic surgery for bimaxillary advancement and better adaptation for customized prosthesis (ENTERPRISES ARTIFIX®) previously planned due to the development of orthognathic surgery.

The base to extraoral surgical approaches were the pre-existing scar. Modification was performed in its anteromedial portion, extending in the submental region to install the mandibular component and endaural access to install the prosthetic component (Figure 1). The perforation and installation of the prosthetic components were carried out according to the templates and guides planned virtually (Figure 2).



Figure 1. Preoperative appearance.

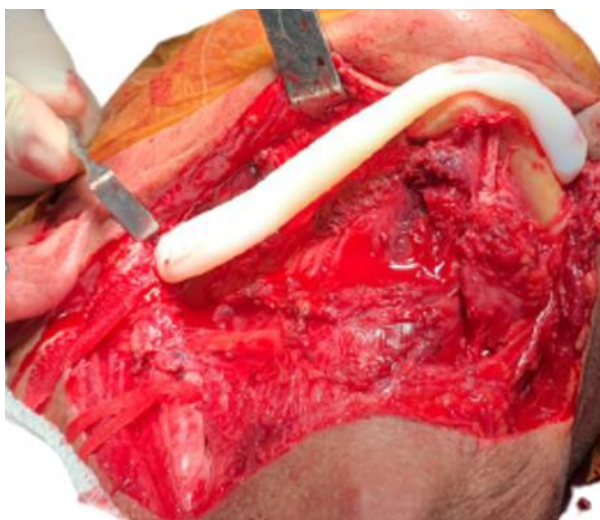


Figure 2. Positioning of the template with drilling guides.

As this is an irradiated patient, having already undergone a previous surgical procedure, it was expected that there would be significant tissue contraction and loss of vascularization. In order to avoid possible complications related to prosthesis exposure, a pedicled flap of the sternocleidomastoid muscle (Figure 3) associated with abdominal fat filling (Figure 4) was planned, fixing them with sutures on the vestibular face of the prosthetic mandibular body and

angle.



Figure 3. Sternocleidomastoid muscle pedicled flap positioned on the lateral face of the mandibular component.



Figure 4. Abdominal fat graft positioned over the mandibular component.

Abdominal fat was also transplanted to the articular region. The suture was performed by planes with polyglactin 910 4-0, nylon 5-0, ending with the installation of a vacuum drain and bandages.

In the immediate postoperative period, the facial contours and mandibular perimeter are reestablished

(Figure 5). In the postoperative radiography, there are images that suggest a good positioning of the prosthetic components and satisfactory fixations of the performed osteotomies (Figure 6). At a 9-month follow-up, the patient is satisfied with the surgical result, showing significant improvement related to masticatory function, sleep quality, occlusion, and facial aesthetics.



Figure 5. Immediate postoperative appearance.

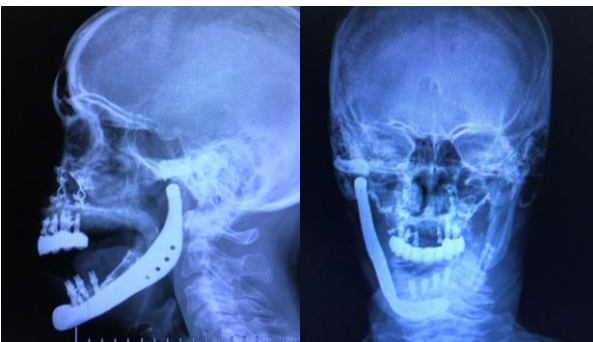


Figure 6. Profile and P-A skull radiographs, respectively, showing images suggestive of satisfactory fixation and prosthetic positioning.

3. DISCUSSION

Reconstructions of the temporomandibular joint (TMJ) with alloplastic implants have been widely studied over the years, showing to be an effective, reliable, and safe treatment option. TMJ prostheses can be divided into two groups: stock and customized. Stock products are ready-made with standardized shapes and sizes in an attempt to make it appropriate for the largest number of patients. Customized ones are manufactured in a personalized way for each patient taking into account surgical plans and individual anatomy. Both have consistent results and precise indications⁴.

Total TMJ reconstructions with prostheses can be

considered as the best treatment option for ankylosis, autoimmune diseases, multiple failed TMJ surgeries, tumors, irreparable trauma, among others^{3,5}. However, some prerequisites such as: history of pain and functional changes, imaging tests confirming the presence of pathologies and structural changes, as well as failure in conservative treatments, must be associated to indicate total joint reconstruction³.

Regarding which type of prosthesis would be the most suitable for each treatment, despite the fact that stock prostheses have similar results, the customization associated with virtual planning allows better adaptation of the components, increasing predictability and safety and reducing surgical time⁴.

The choice of the material used in the present article took into account the difficulty of the case and the need to perform associated orthognathic surgery. In complex cases, with the need to reposition the jaws, customization is recommended, showing the disadvantage of a high production cost⁴.

In some countries, registration certificates for the use of the most renowned customized brands on the market, such as ZIMMER BIOMET® and TMJ CONCEPTS® are not available due to their high commercial value^{5,6}. This fact has led to the creation of countless other competing brands using similar models with more accessible values, but they do not have the same types of materials, design, pre-clinical laboratory tests, and extensive reports of clinical results. These are factors that must be considered by the patient and the surgeon^{7,8}.

Research that supports total unilateral TMJ reconstruction is found in the literature, with evidence of success, making it a predictable procedure when the contralateral side is healthy, as in the case of this article⁹.

In order to optimize the results of this case, a pedicled flap of the sternocleidomastoid muscle was planned, although not so commonly used, it is an interesting resource for head and neck reconstructions. With reports of consistent results for mandibular reconstructions, they present few complications and are in a favorable anatomical region due to the proximity to the recipient site¹⁰.

In addition to this, autogenous abdominal fat transplantation was performed, as it was a previously operated area and irradiated with significant tissue contraction and fibrosis. Besides preventing the formation of fibrosis and heterotopic calcifications, fat helps to increase tissue volume, reducing possible exposure of the prosthesis and favoring local aesthetics¹¹.

4. CONCLUSION

Cases of maxillofacial reconstructions in patients with sequelae of head and neck cancer are complex and challenging for the surgeon and team. The care and attention to the smallest details of the surgical planning invariably using technologies and the greater amount of available resources in addition to the surgeon's

expertise are essential to achieve predictable results, restoring quality of life to the patient.

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