



Modified Labiomandibuloglossotomy Approach for Solid Tumor of the Floor of the Mouth: A Case Report and Literature Review

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Abstract

Surgical access for tumors found on the floor of the mouth represents a challenge for surgeons due to its location. Different techniques have been described for this type of tumors (transcervical, transmandibular, transparotid, transoral), however, sometimes they have anatomical limitations. The purpose of this study is to describe a modified labiomandibuloglossotomy approach through a case report of a 36-year-old male diagnosed with adenoid cystic carcinoma on the floor of the mouth. Performing this technique allows more exposure for the resection of these tumors, without damaging the adjacent anatomical structures. Previous planning and respect for facial aesthetic subunits as references for surgical incisions optimize the aesthetic results and wound healing when performed appropriately. The proper selection of the patient, exposure, modification of the surgical technique and its complications will be discussed.

Keywords: Labiomandibuloglossotomy; Tumors; Floor of the Mouth; Aesthetic Subunits

Introduction

The presence of large tumors on the floor of the mouth represents a challenge when choosing the correct approach for their management. The treatment of these tumors is mainly ruled by the site, stage and histopathology [1,2]. Open surgery has been one of the main treatments, and multiple approaches have been described in the literature. The most commonly used are the transcervical, transparotid, transmandibular, transoral and endoscopic approaches, which, if done inadequately, could cause limitation for the surgeon, due to incorrect vascular control and potential nerve damage [3-5]. The labiomandibuloglossotomy (Trotter's) approach was described by William Trotter in 1920, who described it as the combination of a transmandibular and transoral approach, being an excellent option to access benign and malignant tumors present in the oral cavity and deep neck spaces, allowing more exposure, without presenting difficulty when surgically resecting

the tumor and ensuring wide margins without affecting adjacent vital anatomical structures [3,6]. This approach divides the oral cavity and the floor of the mouth into two parts, accompanied with the division of the lower lip, performing a paramedian osteotomy, which preserves the integrity of the mental nerve [7-9]. The use of the aesthetic subunits of the face as an anatomical guide to make surgical incisions is an advantage that allows the scars to be hidden easier, restoring functional structural support of the soft tissues and achieving a better aesthetic appearance [10,11]. The correct preoperative planning and a meticulous technique are crucial to avoid potential complications [2,4].

Objective of the Study

The objective of this study is to describe a modified labiomandibuloglossotomy technique as a surgical approach for a solid tumor on the floor of the mouth through a case report of a 36-year-old male diagnosed with adenoid cystic carcinoma.

Case Report

A 36-year-old male attended the Oral and Maxillofacial Surgery Unit of the University Hospital of Maracaibo, Venezuela, presenting a tumor on the floor of the mouth with an 8-year course of evolution, asymptomatic, without previous treatment. Extraoral examination revealed a diffuse swelling, firm on palpation in the anterior cervical region without signs of inflammation. Cervical lymph nodes were not palpable. A clinical intraoral examination revealed a mass on the floor of the mouth with the same color as the mucosa, smooth surface, firm consistency, poorly defined edges and painless on palpation. CT scan showed a hypodense, multilobed space-occupying lesion, affecting the muscular planes at the level of the lower portion of the oral cavity including the base of the tongue, of approximately 52 x 45 x 45 mm in size, partially delimited, with compromise of the oropharynx at its posterior limit (Figure 1). Jointly, a nasofiberscopy did not reveal lesions into the deep structures of the nose, throat and larynx. Incisional biopsy and fine-needle aspiration cytology were not performed due to size and location of the tumor. The treatment plan was the complete excision of the lesion through a labiomandibuloglossotomy approach under general anesthesia.



Figure 1: CT scan (axial view) showed a hypodense, multilobed, partially delimited image affecting the muscular planes at the level of the oral cavity and the base of the tongue.

A geometrical skin incision was made, taking into account the mentolabial groove, until reaching the lower edge of the jaw in the submental fold, extending to the anterior cervical region in a zig-zag pattern, allowing for better adaptation of the soft tissues. Dis-

section was made by planes, reaching the reflection of the mucosa of the gingivolabial sulcus. Another incision was made at the level of the midline of the mandibular gingiva for the elevation of the mucoperiosteal flap on both sides, until reaching the anterior aspect of the mandible at a distance of 2 to 3 cm from the midline, avoiding injury to the mental nerve. A paramedian osteotomy is made starting at the level of the lateral incisor and canine implemented in a staggered manner, culminating on the mental symphysis respecting the root of the lower incisors (Figure 2). Next, the soft tissue and muscle dissection was completed to reach the mucosa on the floor of the mouth. The mandible was separated into two parts laterally, and a partial glossectomy was performed in the middle raphe of the tongue, in its avascular plane, preserving the bilateral neurovasculature and giving a broader exposure. Extracapsular dissection of the tumor lesion was completed (Figure 3) and intraoral closure by planes was performed. Once the transient maxilomandibular fixation has been completed, internal fixation of the osteotomy was carried out with osteosynthesis material, to finally perform extraoral closure by planes. A modified closure on the lip vermilion with a Z-plasty was performed in order to avoid retraction (Figure 4). The histopathological study revealed a diagnosis of adenoid cystic carcinoma, cribriform pattern, and immunohistochemistry was performed exposing the same result in minor salivary gland, immuno-reactive to broad-spectrum cytokeratin (CK AE1/AE3), epithelial membrane antigen (EMA) and cytokeratin 7 (CK7) with moderate expression of indicator of cell proliferation KI-67 (15%) and myoepithelial basal cells positive for smooth muscle actin (SMA) and P63 protein.



Figure 2: Staggered paramedian osteotomy.

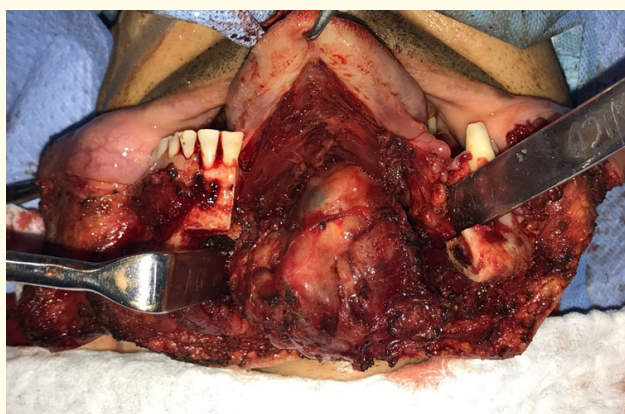


Figure 3: Wide tumor exposure due to mandibular separation and partial glossectomy.



Figure 4: Modification of the closure using a Z-plasty in the vermillion of the lower lip.

The patient received medical treatment with antibiotic therapy along with NSAIDs, nasal decongestants and antiallergics for a period of 10 days, a hypercaloric and hyperproteic liquid diet through nasogastric tube for a period of 8 weeks. Adequate oral hygiene was explained through conventional brushing and locoregional irrigations with 0.9% saline, physiotherapy was indicated for the mobility of the perioral muscles. The patient attended 7 days post-operative where the wounds were in a healthy healing process, without any complications. Periodic controls were carried out for 1 year where there were no signs of recurrence or sensory and motor neuronal changes. In addition, the patient underwent adjuvant therapy.

Discussion and Conclusion

Labiomandibuloglossotomy or Trotter's approach is an important technique to access and eradicate larger benign and ma-

lignant tumors located at the base of the tongue, oropharynx, and the cranio-cervical junction that require extensive exposure to be resected, without damage to neurovascular structures, however, it is contraindicated in patients with infiltration of bone tissue of the jaws [1,2,4]. In our experience, the labiomandibuloglossotomy can be considered when the lesion covers the entire floor of the mouth, where an intraoral approach is not sufficient to expose the tumor, since it is generally reserved for small well-circumscribed tumors. This procedure gave us excellent exposure and local control of the tumor, avoiding its rupture.

Imaging modalities, such as computed tomography and magnetic resonances, represent an important support in determining the extent and location of these entities, their relationship to adjacent anatomical structures and, thus, helping to establish a surgical plan, in conjunction with the clinical examination [3,12,13]. In the present case, the main imaging method used was the computed tomography, not only for the general evaluation, but for the planning and selection of the approach. It was evident in the CT scan that the tumor reached the oropharynx in its posterior limit and thus, the use of this approach was decided since otherwise it would have not been feasible to completely resect it. Also, other previously mentioned criteria such as the presence of malignancy and the size of the solid tumor were taken into account.

In our case, the histopathological study showed a diagnosis of adenoid cystic carcinoma of minor salivary gland, which according to the literature is the fourth most common malignant tumors neoplasm in the minor and major salivary glands represents 10% of all cases. The palate, parotid, and submandibular and sublingual salivary glands are the most frequent sites of presentation, that unlike our clinical case, this malignant neoplasm in the floor of the mouth is less frequent than intraoral sites [14,15]. Generally, it affects people between the fourth and fifth decades of life with a predilection for the female gender, which differs in our case since the patient is male, being in the third decade of life. 3 types of tumor cell patterns are distinguished: cribriform, tubular and solid. the cribriform pattern, found in our case, is the most classic and recognized variant, with better prognosis than the solid pattern. Furthermore, a characteristic feature of the adenoid cystic carcinoma is the presence of perineural invasion, corresponding to a clinical finding of dull and constant pain, which differs from our case since the patient did not present this symptom [14,16,17].

Regarding the surgical techniques, different incisions in the lower lip have been reported for the approach of head and neck tumors. The midline straight incision continues to be the most com-

monly used. However, this incision results in unfavorable aesthetic results associated with the division of the vermilion on the lower lip and the division of the mental contour [10,11]. In our case, a geometric incision was made at the interface between the aesthetic subunits of the lower lip and chin, facilitating the scar to be imperceptible and giving a satisfactory aesthetic result, as there was no change in contour, thickness, and color, restoring soft tissues functionality. Additionally, a closure with a Z plasty design in the anterior cervical region and labial vermilion, to avoid further retraction of the wound and better aesthetic appearance was performed.

It is important to mention that when performing the glossotomy, care must be taken to remain in the middle raphe of the tongue, since its plane is avascular and allows preservation of the bilateral neurovasculature, allowing a full exposure for tumor resection. Intuitively, this conservative approach should decrease the potential for tongue swelling, wound dehiscence, fistulae formation and a propensity for lingual inversion at the closure line [2-4,18].

Gonzales., *et al.* applied the median labiomandibulotomy with successive modifications, especially in relation to the osteotomy technique and its subsequent fixation. They have described labiomandibulotomy with modification of the layout of the mandibular osteotomy by creating a step in the midline and extraction of the central incisor [19]. In our case, the use of this technique led us to the introduction of another modification, such as a staggered paramedian osteotomy, starting at the level of the lateral incisor and canine and culminating in the mental symphysis, being the best option to preserve the integrity of the mental nerve, avoiding injury to dental roots and facilitating intraoperative mandibular reestablishment, providing more stability and comfort.

Possible complications have been described for the labiomandibuloglossotomy approach, such as wound infections, osteosynthesis material failure, salivary fistulae, hypomobility of the tongue, difficulty in swallowing or speaking and dental malocclusions [2-4]. In our case, postoperative controls were performed for over a year, with no locoregional complications found. When performing adjuvant therapy in this pathology, the use of radiotherapy in doses of 60 Gy or more is vital in helping to completely eradicate the microscopic residues of the disease. Furthermore, although spread to regional lymph nodes is rare, late distant metastasis to the lungs and bones is common [14,17]. Performing this postoperative therapy can improve the patient's prognosis, which is why follow-up is essential, as was done in our case.

In a previous study, the median labiomandibulotomy has been reported for the treatment of tumors of the oral cavity, oropharynx and parapharyngeal space, as it permits obtaining a wide surgical field exposure. This technique was analyzed in 21 patients who presented epidermoid carcinoma and the affected anatomical structures were: the mobile tongue (4.7%), tongue base (38.1%), floor of the mouth (9.5%), oropharynx (33.3%) and clivus (14.2%). There are very few reports of the use of the labiomandibuloglossotomy technique for solid tumors on the floor of the mouth [19]. In our experience, using the modification of this technique, a wide exposure of the surgical field is achieved, providing a primary adequate access in order to perform the procedure safely, allowing the surgeon the best opportunity for total tumor resection without fracturing the specimen, and at the same time, preserving normal neurovascular function. When making a surgical incision, the aesthetic units and subunits on the face are anatomical visual limits which provide an advantage, since they help make incisions appropriate for resections of tumors on the floor of the mouth and thus, they are essential for obtaining functional and aesthetic objectives.

Conflict of Interest

None.

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