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Comparative Characteristics of the Methods of Treatment of Malignant Oral Mucosal Tumor

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Abstract: Treatment of malignant tumors of the oral mucosa is a multi-modal challenge. Radiation therapy, chemotherapy, as well as surgical treatment are used in different succession or combination. At the same time, the issues concerning combined or complex treatment, effective against one or several neoplasms, post-therapeutic stage, further progression of a tumor, restoration of postoperative defects, flaps used, as well as patient's life quality following plastic and reconstructive surgery still remain to be pending. Based on our material we compare and evaluate the treatment results - We try to distinguish the optimal treatment option according to the individual plan of each patient

Keywords: Malignant tumors; oral mucosa; delto-pectoral; thoraco-pectoral; skin flaps; single-step plastic surgery.

INTRODUCTION

Malignant tumors of the oral mucosa belong to the neoplasms that are characterized by aggressive growth. These tumors are encountered mainly in age groups over 60 years, although risk of the disease manifests itself at the age of 40 years. According to statistics, malignant tumors of oral mucosa occupy the 6th place among all oncological diseases, while the total incidence of malignant head and neck tumors make up 3% in men and 1.5% in women. Despite the fact that tumors of the aforementioned localization are neoplasms of visual localization (fig. 1.2, 3), in patients with such tumors, the rate of active manifestation at an early stage of the disease does not exceed 10%, while 67% of tumors are diagnosed in the third and fourth stages.

Fig 1.

Fig 2.

Fig 3.

Treatment of malignant tumors of the oral mucosa is a multi-modal challenge. Radiation therapy, chemotherapy, as well as surgical treatment are used in different succession or combination. At the same time, the issues concerning combined or complex treatment,

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effective against one or several neoplasms, post-therapeutic stage, further progression of a tumor, restoration of postoperative defects, flaps used, as well as patient's life quality following plastic and reconstructive surgery still remain to be pending. Apart from progressive growth of the tumor, a certain difficulty in the treatment process is the very concept of a malignant tumor of the oral mucosa that implies neoplasms of anatomically different localizations as well as neoplasms of neighboring organs of the following localizations: buccal mucosa, tongue, floor of the mouth, mucous membrane of the maxillary alveolar process and hard palate, soft palate, uvula, tonsils, palatine vault, and mucous membrane of the mandibular alveolar process.

The assembly of localizations united under one concept, that have various anatomical distinctions as well as sharply different patterns of metastasis differ in distribution/spread as well as in frequency and localization.

Fig 4.

In addition, distant metastasis is distinguished by certain specific patterns (Fig.4).

The oral mucosa make up an important part of an organism, which due to their anatomy and physiology, participate in a complex of indispensable functions: mastication(chewing), respiration, deglutition(swallowing), speech and esthetic aspects. Any manifestation of pathology on the face or in the oral cavity cause undesirable conditions for medical, labor and social adaptation, worsening of life quality, and expansion of the period of social re-integration, while post-operative defect is often incompatible with life without plastic and reconstructive surgery. The problems mentioned are the reason why the issues related to the management of malignant tumors of oral mucosa, in particular the choice of treatment, are important and responsibility-requiring, though the consensus in final decision making remains to be reached.

The Objective of the Study

The study was aimed at the assessment and analysis of the effectiveness of radiation therapy, chemotherapy and surgical treatment in patients with malignant oral mucosa tumors as well as the results of hemiglossectomy and restoration of postoperative defect after the resection of the mouth floor by a single- step plastic and reconstructive surgery using delto-pectoral and thoraco-pectoral skin autotransplant.

The Goals of the study

The goal of the study was to draw up an algorithm for the treatment of malignant tumors of Stages II, III, IV and to make an analysis of the positive and negative aspects of the above methods based on the assessment of the viability of a skin flap used to restore a postoperative defect caused by a surgical operation.

363 patients with malignant tumors of oral mucosa received treatment at Tbilisi Research Center of Oncology from 2016 to 2021.

The patients were grouped as follows: 28 patients made up the age group of 40 years, 137 patients - the group of 40-60 years, 198 patients- the group of over 60 years.

According to the localization, squamous cell carcinoma of the buccal mucosa was revealed in 80 patients, squamous cell carcinoma of the tongue - in 241 patients (Fig. 5, 6), malignant tumor of the mouth floor- in 41 patients.

Fig 5.

Fig 6.

As the etiological factor, 61% of patients named chronic mechanical irritation, improperly fitted dentures, damaged fixed orthopedic structures or fractured teeth roots. Some patients suggested various causes: belated visit because of the threat of pandemic, lupus erythematosus, or Bowen's disease in their medical histories or inadequate long-term treatment of parodontosis or chronic aphthous stomatitis in the dental clinic. The majority of patients did not report on malignant tumors of oral cavity in their family medical histories. Of all examined patients, only in one case malignant tumor of oral mucosa was revealed in the medical history of the previous generation. 31% of patients reported on various oncologic pathologies of genetic origin. In women, cases of family breast cancer were especially common.

Stage I malignant tumor of oral mucosa T1N0M0 was diagnosed in 74 cases,
Stage II, T2N0M0 – in 83 cases.
Stage III, T1-2-3N1 M0 - in 152 cases.
Stage IV, T1-2-3N1-2-3 M1 – in 54 cases.

Accordingly, regional lymphatic metastases were revealed in 206 patients, while distant metastases were diagnosed in 54 cases.

All the patients underwent successive clinical and laboratory examination as well as, cytological and morphological examination of postoperative tissue samples. Ultrasound examination of cervical, mandibular and submental lymph nodes was also performed to detect regional metastases. Cranial, thoracic and abdominal CT Scans were done for distant metastases. Of the patients examined, 3 patients received physical treatment of a neoplasm. 15 patients underwent chemo-radiation therapy 2 years ago. 93% of patients with Stage I tumor received chemoradiation therapy. 7% of patients underwent combined therapy due to the residual tumor: surgical treatment following chemo-radiation therapy.

Surgical treatment implies vast/radical excision of the tumor via single-step plastic surgery using local flaps.

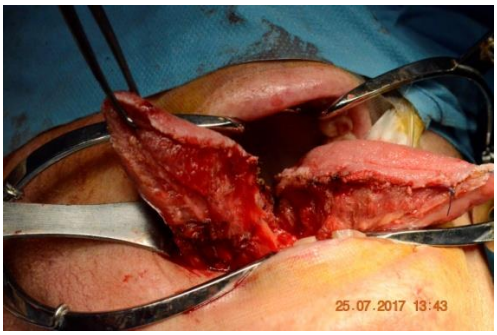

Fig 7.

Fig 8.

Noteworthy, no tumor recurrence was documented in any of these cases for two years.

Of 83 patients with Stage II tumor, 16 patients received chemoradiation treatment, while 67 patients underwent combined therapy: at the

first stage of treatment – surgical intervention, at the second stage - chemoradiation therapy. The surgical treatment included both the resection (removal) of primary tumor and preventive surgery – Wanach's lymph node dissection or radical (fascial-case) dissection of cervical lymph nodes. (Fig. 9).

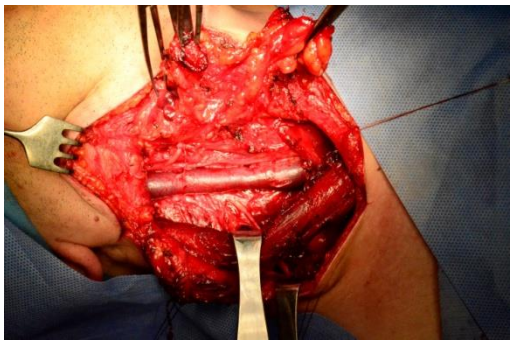

Fig 9.

Of 67 patients, 53 patients underwent cervical lymph node dissection, hemiglossectomy, resection of the mouth floor, fragmentary resection of the mandible, single-step restoration of postoperative defect. (Fig.10 - 11).

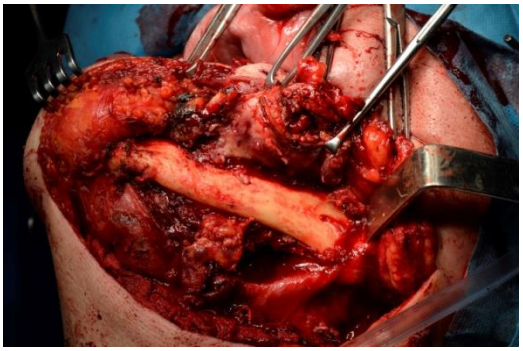

Fig 10.

Fig 11.

Resection of buccal mucosa, fragmentary resection of the mandible, Wanach's lymph node dissection, and extirpation of the salivary gland was performed in 16 cases.

With Stage III tumor, combined or complex mode of treatment was used. Combined treatment for these patients included surgical and chemo-radiation therapy. In particular, radiation therapy was performed simultaneously with chemotherapy according to the radical program. The latter was performed in the form of combined therapy, at the total dose of focal radiation of 70 Gy. For the purpose of chemotherapy, 6 infusions of the new cytostatic VGOG were done every eighth day. One course of treatment included 150 mg of carboplatin and 6 vials of carbocel, 150 mg each.

Surgical treatment was a combined and extended operation, meaning a complete or partial resection of both the primary tumor and nearby organs, as well as intervention in the regional lymphatic collector. More specifically, with malignant tumors of buccal mucosa these were: mastication (chewing) muscles, alveolar process of the maxilla or lower pole of the parotid salivary gland; with malignant tumors of the mouth floor or tongue, it was mandatory to perform hemiglossectomy, resection of the mouth floor including suprahyoid muscles, extirpation of submandibular salivary gland and hemimandibulectomy with or without exarticulation.(Fig 12-13).

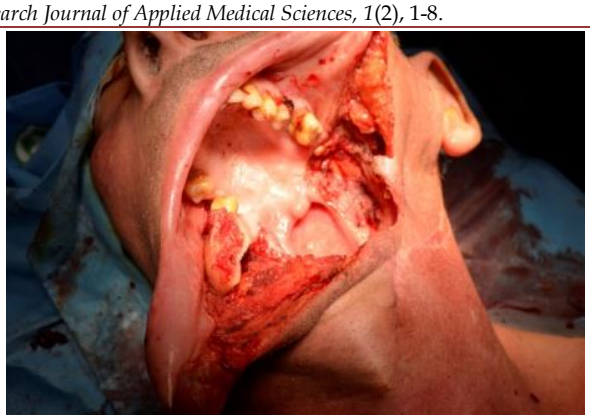

Fig 12.

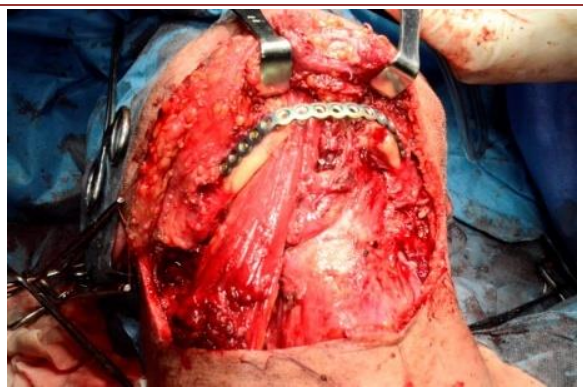

Fig 13.

Regional metastases were radically removed by Wanach's operation or fascial-case dissection of cervical lymph nodes.

In 19 cases post- operative defects were restored using delto-pectoral or thoraco-pectoral skin flaps.(Fig. 14-15-16-17).

Fig 14.

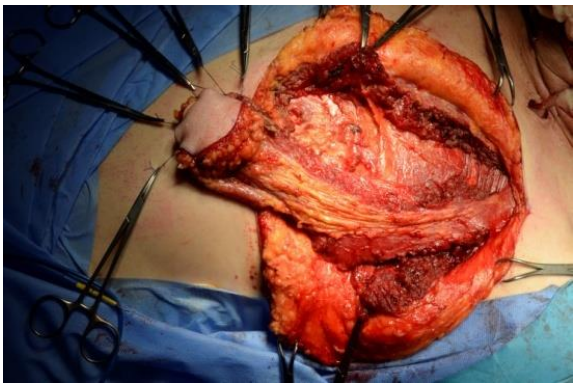

Fig 15.

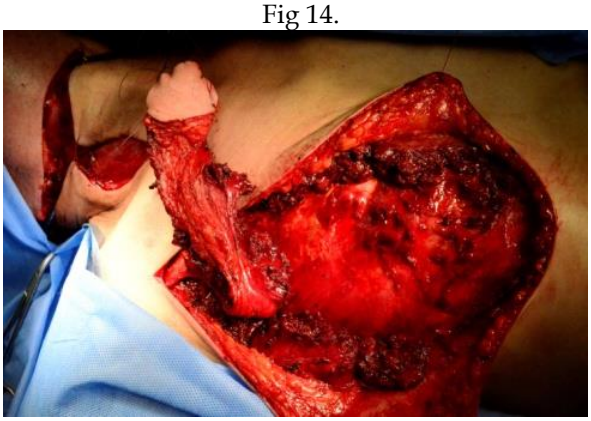

Fig 16.

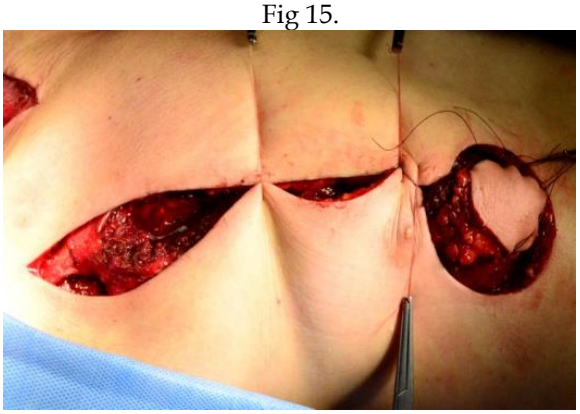

Fig 17.

Hemimandibulectomy was performed in 8% of cases, titan implants were used in 18 cases following hemimandibulectomy. Hemimaxillectomy and alveolar process resection was performed in 13 cases, while

Noteworthy, the majority of patients did not undergo orthopedic treatment for restoration of dentition and occlusion following these large-scale operations, which, undoubtedly, impairs chewing, swallowing, speaking and eating processes and directly worsens the quality of life.

In the group investigated, signs of tumor progression were observed only in 3 patients, whose treatment was continued with chemotherapy, and one patient received palliative care. Necrosis of thoraco-pectoral skin flap was not observed. (Fig. 18-19-20).

Fig 18.

Fig 19.

Fig 20.

In the group with malignant tumor Stage IV the treatment was complex. At the first step of the treatment the patients received chemoradiation therapy. The second step of treatment involved surgery in the form of combined and extended operation which was performed in 47 patients out of 54, while 7 patients underwent only chemoradiation therapy or palliative care. The restoration of post-operative defect was performed by microsurgical technique using skin, muscle and mucosal auto-transplants as well as bone auto-grafts. (Fig. 18 and 19).
(Fig.20)

Necrosis of free grafts was seen in 5 cases out of 45 patients. It should be noted that tumor progression was not observed in any of these cases, however the quality of life and state of vital functions in these patients are extremely low, or rather unsatisfactory.

Regarding distant metastases, the decision whether surgical treatment or palliative care, was made based on their resectability.

Of all above methods, according to the ESMO recommendation, radiotherapy or surgical treatment are separately used in case of limited processes. Both of these methods are thought to be equally effective for local regional control. However, conclusions should be made based on a retrospective clinical analysis. With relatively common forms T1-2-3, a combination of the methods is used – surgery and radiation therapy with or without chemotherapy. The latter can be performed before or after surgery.

Inoperable tumors are treated using radiation therapy and chemotherapy or by a combination of these modes.

US oncologists recommend to perform chemo-radiation therapy only at Stage III-IV. According to the literature data, the local-regional control makes up 95% at the background of radiation therapy. With the spread of tumor T2, this rate drops from 95 to 79% while a five-year life expectancy without recurrence is 80-67%. Clinicians studying the effectiveness of surgical treatment for tongue cancer note that with monotherapy, a five-year life expectancy makes up 81.2%, while a five-year recurrence-free course of the disease is 67.2%.

According to the research results, an important fact is that a 5 mm thick neoplasm is considered to have a favorable prognosis, while a neoplasm of 15 mm or more to be a risk factor for

metastasis to cervical lymph nodes. This points to the need of a mandatory consistent dynamic monitoring of the process and preventive lymph dissection. When choosing a method and strategy of treatment, it is important to take into account that N1-2 makes up 11% of distant metastases even with a small-size tumor T1-2 . This rate is increased up to 28% with N2-3, which indicates that chemotherapy is mandatory to be used in a complex therapy.

According to our study, based on comparative characteristics of the treatment methods of oral mucosal malignant tumors, the leading role is assigned to chemo-radiation therapy. Regarding surgical treatment, in terms of organ-sparing, this method should be used very rarely in specific cases. At the same time, it is necessary to consistently investigate and take into account the thickness of the neoplasm as an indicator of prognostic value in the treatment of Stage II progressive tumors. With Stage II tumors, chemo-radiation therapy is preferable at the initial step of treatment (step1), which should be followed by step 2 to make a decision regarding surgical treatment.

The treatment of Stage III tumors is complex; step 1 – chemo-radiation therapy, step 2 – surgical treatment in the form of a combined and extended surgery.

It is mandatory to refine the approach to postoperative rehabilitation in such patients. In this regard, the issues concerning the restoration by plastic –reconstruction using titan implants or dental implants into the rest of the jaw should be highlighted. This will considerably improve the outcome of postoperative rehabilitation and maintenance of desirable life quality in the patients.

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