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Major approaches oral cancer and bucomaxillofacial surgical procedures: a concise systematic review

Ricardo Barbosa de Freitas[1,2*], **Gisele Delmaschio Amigo Aredes**[1,2], **Igor Mariotto Beneti**[1,2]

[1] UNORTE - University Center of Northern São Paulo, Dentistry Department, São José do Rio Preto, São Paulo, Brazil.
[2] UNIPOS - Post Graduate and Continuing Education, Dentistry Department, São José do Rio Preto, São Paulo, Brazil.

*Corresponding author: Ricardo Barbosa de Freitas.
Unorte/Unipos – Graduate and Postgraduate education,
Dentistry department, São José do Rio Preto, São Paulo,
Brazil.
E-mail: peritovipricardob@hotmail.com
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Abstract

Introduction: In oral neoplasms, squamous cell carcinomas (SCCs) account for more than 90% of cases. SCCs can have several levels of differentiation and often give rise to lymph node metastases. Clinical recognition and evaluation of oral mucosal lesions can detect up to 99% of oral cancers. **Objective:** It was sought to list the main approaches to treating oral cancer, both in early identification and in bucomaxillofacial surgical procedures. **Methods:** The systematic review rules of the PRISMA Platform were followed. The search was conducted from July to August 2024 in the Web of Science, Scopus, PubMed, Science Direct, Scielo, and Google Scholar databases. The quality of the studies was based on the GRADE instrument and the risk of bias was analyzed according to the Cochrane instrument. **Results and Conclusion:** A total of 115 articles were found. 23 articles were fully evaluated and 14 were included and developed in the present systematic review study. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 35 studies with a high risk of bias and 32 that did not meet GRADE and AMSTAR-2. Most studies presented homogeneity in their results, with X^2=88.8%>50%. It was concluded that oral mucosa cancer is one of the most common oral cancers and has a poor prognosis. This can confirm that the planned dental treatment performed during oral cancer treatment produces an improvement in the quality of life of oral cancer patients. The indication for bucomaxillofacial surgery should be meticulously planned. In addition, dentists should consider a patient's ongoing cancer therapy for those patients who come to the dentist while receiving cancer treatment. The use of nomograms in clinical practice should bring significant benefits to patients with oral mucosa cancer.

Keywords: Oral cancer. Bucomaxillofacial surgery. Squamous cell carcinomas.

Introduction

In oral neoplasms, squamous cell carcinomas (SCCs) account for more than 90% of cases. Other tumors of the oral cavity include those of the minor salivary glands, melanomas, and lymphomas [1,2]. SCCs can have several levels of differentiation and often give rise to lymph node metastases. Lymphatic spread to the neck is directly related to the T stage, as well as the depth of invasion and thickness of the tumor [3,4]. Furthermore, an estimated thousands of new cases of oral cancer are diagnosed each year worldwide, with two-thirds of these occurring in Asian countries [1].

The incidence of oral cancer increases with age and is highest in those over 60 years of age, although cases in people under 40 years of age are growing [1]. Oral cancer (OC) is preventable due to predictors such as tobacco and alcohol, which increase the likelihood of the disease. Prevention and early diagnosis begin with the identification of potentially malignant lesions of the oral mucosa and local conditions that promote chronic inflammation [2].

Clinical recognition and evaluation of oral mucosal lesions can detect up to 99% of oral cancers. As stated

by the World Health Organization, any suspicious lesion that does not diminish within two weeks of detection and removal of local causes of irritation should be biopsied, in addition to vital staining with toluidine blue and autofluorescence imaging [5-9].

In this context, studies address the importance of dental surgeons in reducing oral cancer, with their participation in prevention, the anticipation of diagnosis, treatment orientation, and rehabilitation of patients [10,11]. In this context, smoking is one of the main risk factors for oral cancer, becoming an important object for dentistry students and dental surgeons who are directly involved in the early diagnosis, treatment, and orientation of patients [12-14]. Oral cancer therapy is associated with a multitude of head and neck sequelae including hyposalivation, increased risk of tooth decay, osteoradionecrosis of the jaw, radiation fibrosis syndrome, mucositis, chemotherapy-induced neuropathy, dysgeusia, dysphagia, mucosal lesions, trismus, and infections [15].

Given this, the present study sought to list the main approaches to treating oral cancer, both in early identification and in bucomaxillofacial surgical procedures.

Methods

Study Design

This study followed the international systematic review model, following the PRISMA (preferred reporting items for systematic reviews and meta-analysis) rules. Available at: http://www.prisma-statement.org/?AspxAutoDetectCookieSupport=1. It was accessed on: 07/19/2024. The AMSTAR-2 (Assessing the methodological quality of systematic reviews) methodological quality standards were also followed. Available at: https://amstar.ca/. It was accessed on: 07/19/2024.

Data Sources and Search Strategy

The literature search process was carried out from July to August 2024 and developed based on Web of Science, Scopus, PubMed, Lilacs, Ebsco, Scielo, and Google Scholar, covering scientific articles from various periods to the present day. The descriptors (DeCS / MeSH Terms. Available on: https://decs.bvsalud.org/) were used: "Oral cancer. Bucomaxillofacial surgery. Squamous cell carcinomas", and using the Boolean "and" between MeSH terms and "or" between historical findings.

Study Quality and Risk of Bias

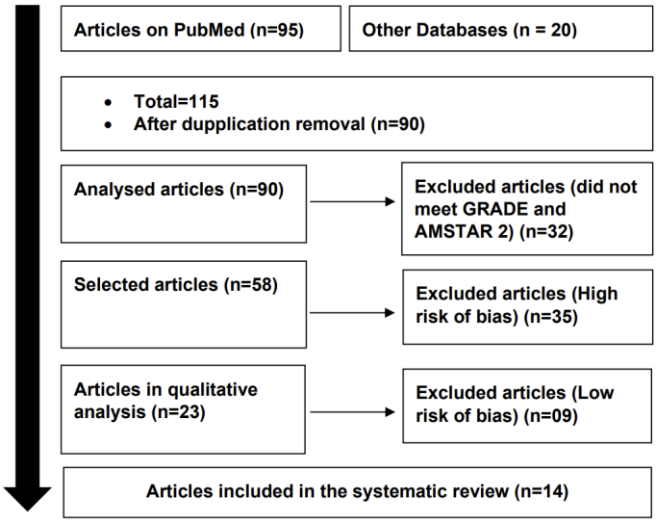
The quality was classified as high, moderate, low, or very low regarding the risk of bias, clarity of comparisons, precision, and consistency of analyses. The most evident emphasis was on systematic review articles or meta-analysis of randomized clinical trials, followed by randomized clinical trials. Low quality of evidence was attributed to case reports, editorials, and brief communications, according to the GRADE instrument. The risk of bias was analyzed according to the Cochrane instrument by analyzing the Funnel Plot graph (Sample size versus Effect size), using Cohen's d test.

Results

Summary of Findings

A total of 115 articles were found that were submitted to eligibility analysis, and 14 final articles were selected from the total of 23 to compose the results of this systematic review. The studies listed were of medium to high quality (Figure 1), considering the level of scientific evidence of studies such as meta-analysis, consensus, randomized clinical, prospective, and observational. Biases did not compromise the scientific basis of the studies. According to the GRADE instrument, most studies presented homogeneity in their results, with X^2=88.8%>50%. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 35 studies with a high risk of bias and 32 studies that did not meet GRADE and AMSTAR-2.

Figure 1. Flowchart showing the article selection process.

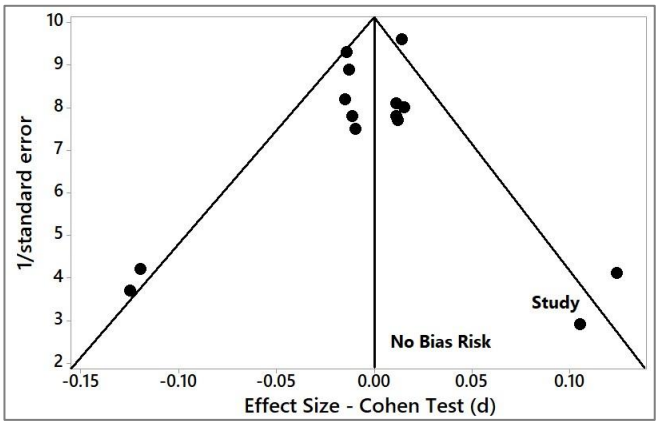


Source: Own authorship.

Figure 2 presents the results of the risk of bias of the studies using the Funnel Plot, showing the calculation of the Effect Size (Magnitude of the difference) using Cohen's Test (d). Precision (sample size) was determined indirectly by the inverse of the standard error (1/Standard Error). This graph had a symmetrical behavior, not suggesting a significant risk

of bias, both among studies with small sample sizes (lower precision) at the base of the graph and in studies with large sample sizes at the top.

Figure 2. The symmetrical funnel plot does not suggest a risk of bias among the studies with small sample sizes, which are shown at the bottom of the graph. High confidence and high recommendation studies are shown above the graph (n= 14 studies).



Source: Own authorship.

Major Findings

Regarding treatment difficulties in oral cancers, a recent study evaluated the change in laryngeal grade and intubation difficulty at subsequent surgery in patients with prior free flap reconstruction (FFR) for oral cancer (S1) followed by a subsequent surgery (S2) that required intubation. A total of 33 patients were included in the study. At S1, the mean laryngeal grade was 1.1. There were 5 difficult intubations. The mean time to S2 was 19 months. At S2, the mean laryngeal grade was 1.4. There were 17 difficult intubations. The analysis showed a significant association between FFR and a more obstructed view of the glottis at S2. FFR increased the odds of having >1 intubation attempt by almost 7-fold (OR 6.74; 95% CI 1.35–33.75), and the odds of difficult intubation by almost 6-fold (OR 5.95; 95% CI 1.84–19.19) at S2, both significant [16]. Furthermore, oral mucosa cancer is one of the most common oral cancers and has a poor prognosis. The study aimed to develop and validate nomograms to predict 1-, 3-, and 5- year overall survival (OS) and cancer-specific survival (CSS) of patients with oral mucosa cancer. A total of 3154 patients with oral mucosa cancer included in this study were randomly assigned to training and validation groups in a 2:1 ratio. Independent prognostic predictors were identified, confirmed, and adjusted in nomograms for OS and CSS, respectively. The C-indices are 0.767 (OS training group), 0.801 (CSS training group), 0.763 (OS validation group), and 0.781 (OS validation group), respectively. Furthermore, the nomograms exhibited remarkable accuracy in prediction and significant clinical significance, as evidenced by receiver operating characteristic (ROC) curves, calibration curves, and decision curve analyses (DCA). Therefore, the developed nomograms performed well in predicting 1-, 3-, and 5-year OS and CSS of oral mucosa cancer patients [17].

A study evaluated in the oral cancer patient population the influence on the quality of life of two dental treatment protocols unregulated hospital treatment versus regular hospital treatment. A quasi-experimental approach was used, justified for ethical reasons. A total of 41 patients were included in the control group (untreated outpatient health center) and 40 in the experimental group (inpatient treatment). A total of 14 questions for both groups were performed in three steps: before starting cancer treatment, during treatment, and after treatment. The proportions of positive responses in the different groups and times were compared by the chi-square test. Based on similar situations during cancer treatment, six questions were identified in favor of the experimental group difference. This number increased to nine after the end of cancer treatment. From the data, it can be confirmed that the planned dental treatment performed during oral cancer treatment produces an improvement in the quality of life of oral cancer patients [6].

A study with a total of 50 newly diagnosed head and neck carcinoma patients had saliva and plasma samples collected, along with periodontal clinical records. The nutritional status parameters consisted of body mass index, serum albumin, hemoglobin, and total lymphocyte count. Cystatin C and lysozyme were the antimicrobial proteins. A logistic regression model showed that periodontal parameters were inversely related to their nutritional status; However, antimicrobial protein levels were directly related to the periodontal condition. Therefore, there is an association between periodontal disease, nutritional status parameters, and antimicrobial protein levels [18].

Tumors found in the mouth and throat are Leukoplakia and Erythroplasia. Leukoplakia is characterized by a whitish area and erythroplasia by a slightly raised red area, usually asymptomatic, which does not go away when the lesion is scraped. These whitish or reddish areas may present with dysplasia or neoplasia. Leukoplakia is a benign condition and rarely develops into cancer. The finding may rule out the possibility of cancer. Only 25.0 % of leukoplakias, when detected, involve precancerous changes that progress to cancer in 10 years if not treated properly. However, in the case of erythroplakia, 70.0 % to 95.0 % of these lesions are cancerous at the time of initial biopsy or will progress to cancer [19].

In this sense, according to Cimardi et al. [20], the

main reason that leads to a low rate of early diagnosis is the low adherence to the dentist's early diagnosis and referral of patients to the treatment of oral cancer in specialized units. Some conditions favor early diagnosis as knowledge of the groups at greater risk and the region of easy access to clinical examination, which does not require special equipment. Deficiencies in professional training or continuing education are pointed out as the main factors for the late diagnosis of oral cancer.

Finally, the dental professional should be able to diagnose, prevent, control, and treat the oral complications that arise during the various stages of cancer treatment. Simple clinical attitudes such as oral hygiene, control of oral biofilm, and use of specific mouthwashes, can prevent or ameliorate secondary manifestations in the mouth caused by cancer treatment [1-5, 21-23].

Conclusion

It was concluded that oral mucosa cancer is one of the most common oral cancers and has a poor prognosis. This can confirm that the planned dental treatment performed during oral cancer treatment produces an improvement in the quality of life of oral cancer patients. The indication for bucomaxillofacial surgery should be meticulously planned. In addition, dentists should consider a patient's ongoing cancer therapy for those patients who come to the dentist while receiving cancer treatment. The use of nomograms in clinical practice should bring significant benefits to patients with oral mucosa cancer.

CRediT

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Conflict of Interest

The authors declare no conflict of interest.

Similarity Check

It was applied by Ithenticate@.

Peer Review Process

It was performed.

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