



Biopsy Technique and Histopathological Diagnosis of Oral Squamous Cell Carcinoma of the Tongue - A Case Report

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Abstract

Introduction: Early detection and diagnosis of oral cancer can increase cure rates from up to 50% to 80% and also improves the quality of life by decreasing the extent of debilitating treatments. Tobacco smoking, alcohol, betel quid, immunocompromised states are some of the known risk factors of the disease. It is important to not only address the patient's chief complaint but to do a comprehensive oral examination to rule out suspicious lesions especially in patients presenting with known risk factors.

Case Presentation: A 59-year old female patient presenting for treatment of periodontitis shows a non- scrapable red-white lesion with indurate borders on the lateral and ventral aspect of tongue undergoes biopsy for a histopathological diagnosis of well- differentiated oral squamous cell carcinoma.

Conclusion: Oral cancer screening is necessary at routine dental appointments, particularly for smokers to provide early detection and appropriate management.

Keywords: Oral squamous cell carcinoma; Biopsy; Well-differentiated; Periodontitis

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Introduction

The most common oral malignancy, squamous cell carcinoma comprising of at least 90% of the all oral cancers has a noteworthy incidence and onerous prognosis due to its early metastasis and high rates of recurrences. The mortality and morbidity rates for OSCC, worldwide have not changed significantly despite the numerous medical advances [1,2]. However, when diagnosed early the survival rate of OSCC is close to 80% as compared to only 30% to 50% when diagnosed in later stages III and IV [3]. The tongue is the most common oral site for SCC comprising 25% to 50% of all cancers and is usually seen in conjunction with alcohol or tobacco abuse [4].

Case Presentation

A 59-year old Caucasian woman was referred to the Department of Periodontics, University of Tennessee Health Science Center with the chief complaint of severe periodontal disease. Medical history revealed neck surgery done a decade ago due to fusion of cervical vertebrae and mild anxiety. The patient also presented with chronic smoking with a pack a day history of more than forty years. Periodontal examination showed generalized probing depths deeper than 7 mm to 8 mm, severe attachment loss, mobility in all teeth, furcation involvement in all molars and generalized severe horizontal and localized areas of vertical bone loss warranting a diagnosis of generalized stage IV grade C chronic periodontitis. Complete oral examination also showed a 1 cm × 1 cm, non-scrapable white lesion with reddish indurate edges and whitish center on the left lateral border and ventral surface of the tongue (Figure 1). The patient also complained of sporadic discomfort arising from the left side of the tongue since once month. The lesion however was not very conspicuous and needed a detailed examination to be revealed. Given the history of smoking and suspicious nature of the lesion it was decided to prioritize biopsy over comprehensive periodontal treatment.

Technique

Lingual nerve block anesthesia was obtained using 2% lidocaine with epinephrine 1:100,000 and local infiltration was done slightly further from the lesion with 2% lidocaine and 1:50,000 epinephrine to obtain hemostasis. A scalpel was used to make an elliptical incision surrounding the lesion with 3 mm of seemingly uninvolved tissue (Figure 2). The depth of the incision was restricted 4 mm to 5 mm deep to include the entire epithelium and some part of the connective tissue. Holding



Figure 1: Suspicious non-scrapable indurated whitish lesion on the left ventral tongue.



Figure 4: Continuous interlocking sutures for primary closure.



Figure 2: Elliptical incision made with a scalpel.

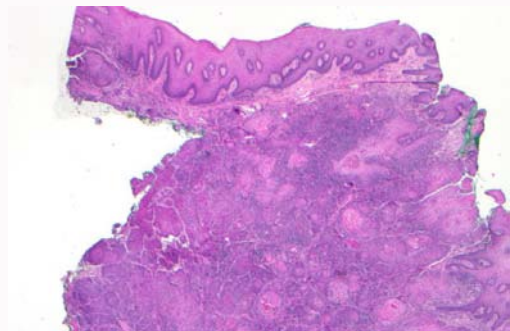


Figure 5: Photomicrograph showing a well differentiated squamous cell carcinoma with keratin pearl formation (H&E stain, total magnification x20).



Figure 3: Suture was placed through the anterior end of the specimen for directional orientation.

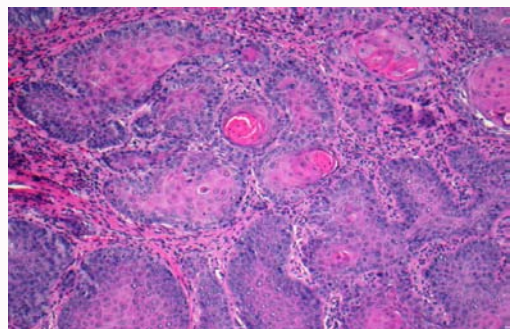


Figure 6: Photomicrograph showing the invasive tumoral cells with keratin pearl formation (H&E stain, total magnification x100).

the tissue with a tissue forceps the tissue was pulled up as the incision continued along the established depth. A suture was placed through the anterior end of the specimen for directional orientation (Figure 3). The specimen was then carefully transferred to 10% neutral formalin bottle with volume at least 20 times that of the biopsied tissue, for proper fixation. The margins of the wound were then undermined to allow them to be sutured. Continuous interlocking sutures were placed to approximate the margins and to obtain primary closure (Figure 4).

Histological examination

The lesion was excised completely, and a suture was placed in the anterior margin of the specimen. The specimen was submitted for routine histopathologic examination, and consisted of one piece of soft tan tissue measuring 14 mm × 11 mm × 6 mm. The tissue margins were inked for marginal assessment.

Histopathologically, an infiltrative tumor arising from the surface

stratified squamous epithelium was noted. The tumor was composed of a proliferation of atypical epithelioid cells arranged in nests and islands with keratin pearl formation (Figure 5 and 6); extending to the depth of the tissue, up to 6 mm with intramuscular infiltration. The tumoral cells exhibited nuclear pleomorphism and atypical mitotic figures (Figure 7). No perineural and perivascular invasion was evident. A final diagnosis of squamous cell carcinoma, well differentiated type was made.

Marginal assessment of the specimen showed the anterior margin was transected by the tumor. Posterior and inferior margins were involved with the dysplastic epithelium (Figure 8), while superior margin was free of involvement.

Discussion

Biopsy, whether incisional or excisional is a universally accepted method for establishing a correct diagnosis for mucosal lesions

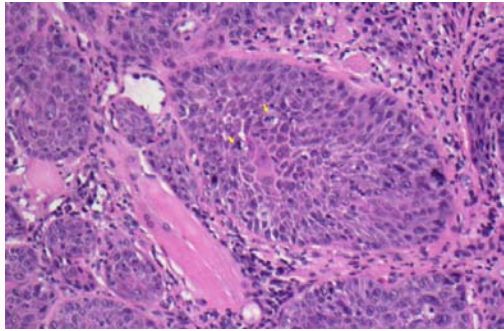


Figure 7: Photomicrograph showing the infiltrating tumoral cells into the skeletal muscle fibers and atypical mitotic figures (arrows) (H&E stain total magnification x200).

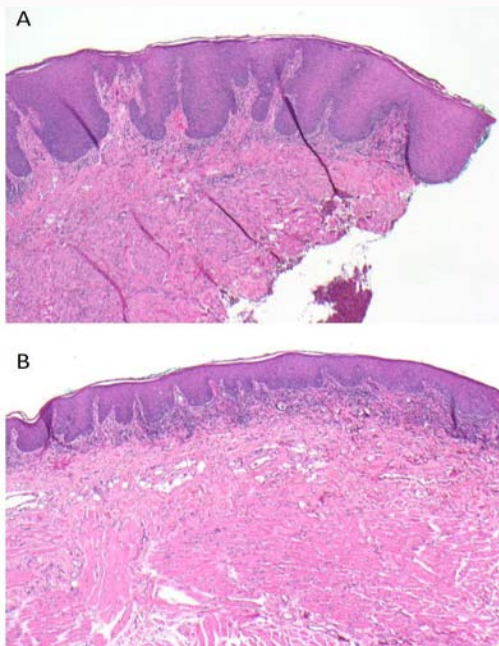


Figure 8: Photomicrograph showing the infiltrating tumoral cells into the skeletal muscle fibers and atypical mitotic figures (arrows) (H&E stain total magnification x200).

suspected to be cancerous. Excisional biopsy is the treatment of choice for localized tumors where there is no metastasis to the neck. Usually excisional biopsy is reserved for exophytic tumors less than 20 mm in size and entophytic tumors less than 15 mm in size and 3 mm in depth [5]. Selection of the site for taking the biopsy is the most important part of the procedure. The tissue should be representative of the most severely affected area and surrounding healthy margins. Inaccurate site selection leads to inaccurate diagnosis, which may further lead to under or over treatment depending upon the specimen. Sometimes, biopsy will need to be taken from multiple sites if the lesion is non-homogeneous, however multiple samples need to be submitted in separate containers. With 1.3 billion smokers worldwide, tobacco is the most important, independent, but preventable risk factor for premature death, globally [6]. A number of multifaceted pathways have been implicated in tobacco's carcinogenic role. Tobacco is known to alter the expression of multiple genes like the cancer suppressor p53 gene. Mutation of this gene transforms its regulatory effect on cell growth to an oncogene. Tobacco also inhibits functions

of immune response systems and alters the IL-2 and IL-4 expressions in CD4 and CD8 subsets of T-cells. Suppression of immune system as seen in immunocompromised patient's leads to a 100 times increase in malignancy rates as compared to normal ones. At lower concentrations free radical like reactive oxygen species, reactive nitric oxide species and others produced by cellular metabolites are an important line of defense against microbial invasion. But, foreign substances especially tobacco and its toxic metabolites have been known to induce free radicals causing cellular DNA damage and induction of carcinogenesis. Another possible theorized carcinogenic pathway is the role of tobacco in inducing the latent Epstein-Barr virus to cause malignancies [7]. The form in which tobacco is consumed, that is either smoked or smokeless is interestingly known to affect the histopathological changes. A study by Samantha et al. [8] correlating the clinical diagnosis of leukoplakia to histological diagnosis of malignancy has shown smokeless tobacco to show more severe dysplastic changes than smoked tobacco and also patients who used tobacco for more than 10 years were 2.17 times more likely to have moderate to severe dysplasia than those using under 10 years.

Hence an important step in reducing cancer mortality is the early detection of smaller lesions allowing less aggressive treatment modalities. However, prognosis remains poor as most often detection is usually made in later, either Stage III or IV stages of cancer [9]. In a study to attain information on the screening ability of dentists to correctly detect suspicious lesions leading to oral cancer, the ability was limited to only 61.4%. The study indicated a need to improve the diagnostic ability of clinicians to detect oral malignancies or precancerous conditions [10].

Conclusion

Chronic history of smoking is a red flag and a thorough examination is mandatory at every dental appointment to rule out suspicious oral lesions irrespective of the patients' chief complaint.

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