

Case report

Oral Carcinogenesis Unveiled: A Comprehensive Case Study on the Progression from Verrucous Carcinoma to Squamous Cell Carcinoma

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Abstract

This case report presents the clinical history, examination findings, and histopathological analysis of Mr. Sankar, a 40-year-old male patient, who reported pain and swelling in the lower left side of the jaw for the past 3 months. Initial examination revealed a whitish proliferative growth with papillary projections. The patient's history of tobacco and mawa chewing, cigarette smoking, and alcohol consumption for 25 years raised concerns about potential oral malignancies. The subsequent biopsy and histopathological investigation unveiled a progression from Verrucous Carcinoma to Squamous Cell Carcinoma.

Keywords: Oral Carcinogenesis, Verrucous Carcinoma, Squamous Cell Carcinoma, Progression, Histopathological Analysis, Oral Cancer.

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Introduction

Oral cancers being a global health concern, encompassing a diverse spectrum of malignancies with varied clinical presentations and outcomes. Among these, Verrucous Carcinoma (VC) and Squamous Cell Carcinoma (SCC) are two distinctive entities, each posing unique challenges in terms of diagnosis, treatment, and prognosis (1). This case report delves into the intricate clinical history and histopathological findings of Mr. Sankar, shedding light on the rare progression from Verrucous Carcinoma to Squamous Cell Carcinoma.

Verrucous Carcinoma is an uncommon and distinct variant of oral squamous cell carcinoma. A locally aggressive growth pattern characterizes it and is often carcinoma. A locally aggressive growth

pattern characterizes it and is often associated with well-differentiated, slow-growing lesions (2). VC commonly arises in the oral cavity, including the buccal mucosa, gingiva, and alveolar mucosa, as observed in our patient. Clinically, these lesions present as white or greyish-white plaques or masses with a verruciform or papillary surface. Unlike conventional squamous cell carcinoma, VC exhibits minimal invasion into the underlying tissues and has a propensity for local extension (3).

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One of the hallmark features of VC is its low metastatic potential, making it a distinct entity within the spectrum of oral cancers. However, its locally destructive behaviour can lead to significant morbidity if not diagnosed and managed in a timely fashion. (4) Risk factors for VC include chronic irritation, such as that caused by tobacco use, which was notably present in our patient's history. Despite its relatively indolent nature, VC poses challenges in diagnosis due to its clinical resemblance to benign lesions, emphasizing the importance of histopathological confirmation. (5)

In contrast to Verrucous Carcinoma, Squamous Cell Carcinoma is the most common malignant neoplasm of the oral cavity. SCC arises from the squamous epithelial cells lining the oral mucosa and may manifest in various anatomical locations, including the tongue, floor of the mouth, palate, and gingiva. Unlike VC, SCC is characterized by a more aggressive growth pattern, with a higher potential for invasion into adjacent tissues and metastasis to regional lymph nodes.

Clinically, SCC often presents as an ulcerative or exophytic mass, and patients may experience symptoms such as pain, dysphagia, or odynophagia. The risk factors for SCC are diverse and include tobacco use, alcohol consumption, human papillomavirus (HPV) infection, and chronic irritation. (6) Early detection and intervention are paramount for favorable outcomes in SCC, as delayed diagnosis can lead to advanced disease stages with poorer prognoses.

The progression from Verrucous Carcinoma to Squamous Cell Carcinoma, as observed in our case, is a rare phenomenon. While VC is generally considered a low-grade malignancy with minimal metastatic potential, the transformation to SCC signifies an alteration in the tumor's biological behavior. Understanding the factors driving this transition is crucial for developing

targeted interventions and improving patient outcomes.

In the subsequent sections of this report, we will explore Mr. Sankar's clinical journey, the comprehensive examination findings, and the detailed histopathological analysis that unveiled the rare transformation from Verrucous Carcinoma to Squamous Cell Carcinoma.

Case Presentation

A 40 year old male came with a chief complaint of pain and swelling in the lower left side of the jaw. Initial examination revealed an irregular, whitish proliferative lesion with papillary projections on the alveolar and buccal mucosa. The lesion measured 9.5 x 4.5 cm and exhibited everted, well-defined edges. Notably, the patient's personal history included a long-standing habit of tobacco and mawa chewing, cigarette smoking, and alcohol consumption.

Clinical Examination

On examination the patient was, well-oriented patient with no systemic abnormalities. Facial asymmetry and a palpable, hard sublingual lymph node were observed on extraoral examination. Intraoral examination identified reduced mouth opening and an indurated, non-tender lesion.



Figure 1: Shows the presence of a whitish proliferative lesion with surface papillary projections seen on the alveolar and buccal mucosa

Histopathological Analysis

An incisional biopsy from the left mandibular alveolus revealed hyperparakeratinized stratified squamous epithelium with extensive parakeratin plugging, verrucous projections, and broad elongated rete ridges. Mild to moderate dysplasia was evident, with a break in the basement membrane. The connective tissue stroma showed minimal malignant cells, intense chronic inflammation, moderate vascularity, and areas of haemorrhage. The diagnosis suggested a progression from Verrucous Carcinoma to Squamous Cell Carcinoma.

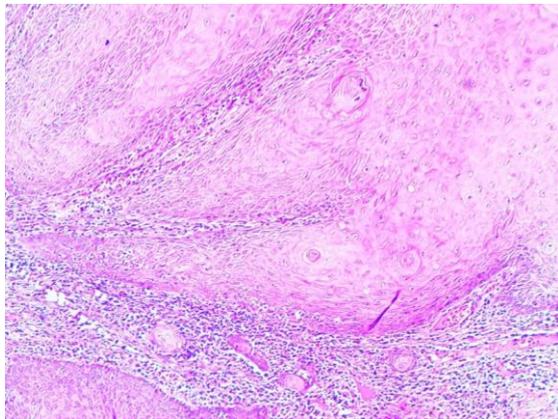


Figure 2: Photomicrograph shows stratified squamous epithelium with acanthosis and mild epithelial dysplasia along with a break in the continuity of the basement membrane with few malignant epithelial cells and intense chronic inflammatory cell infiltrate in the subjacent connective tissue stroma.

Discussion

Clinical Implications of Verrucous Carcinoma (VC): Verrucous Carcinoma (VC), though relatively rare, poses unique challenges due to its indolent nature and clinical resemblance to benign lesions. It typically manifests as a well-differentiated, slow-growing lesion with a verruciform or papillary surface. (5) The occurrence of VC

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is often associated with chronic irritation, as seen in our patient's history of prolonged tobacco and mawa chewing. The slow progression of VC can lead to delayed diagnosis, emphasizing the importance of thorough clinical examination and histopathological confirmation.

The local aggressiveness of VC is a distinctive feature, causing considerable tissue destruction despite its low metastatic potential. In Mr. Sankar's case, the facial asymmetry and palpable sublingual lymph node indicated the local impact of the lesion. The reduced mouth opening further underscored the challenges posed by VC, affecting functional aspects such as speech and nutrition.

Histopathological Characteristics of Verrucous Carcinoma:

Histopathologically, VC is characterized by hyperparakeratinized stratified squamous epithelium with extensive parakeratin plugging, surface verrucous projections, and broad elongated rete ridges. (7) In this case, the histopathological examination confirmed these features along with mild to moderate dysplasia. The underlying connective tissue stroma showed evidence of malignant cells, chronic inflammation, and moderate vascularity, indicative of the tumor's dynamic interaction with the surrounding microenvironment.

The break in the basement membrane observed in the histopathological findings highlights a critical aspect of VC, suggesting the potential for invasion. Despite its generally slow growth and local aggressiveness, VC's transformation into Squamous Cell Carcinoma, as witnessed in this case, introduces a new layer of complexity to its clinical behavior.

Squamous Cell Carcinoma (SCC) – A Shift in Behavior:

Squamous Cell Carcinoma is a more common and aggressive form of oral cancer, characterized by a higher potential for invasion and metastasis. (8) The clinical

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presentation of SCC often includes ulceration, exophytic masses, and symptoms such as pain and dysphagia. Unlike VC, SCC demands prompt attention due to its rapid progression and increased risk of regional and distant spread.

The transition from Verrucous Carcinoma to Squamous Cell Carcinoma represents a significant shift in the tumor's behavior. The underlying molecular mechanisms driving this transformation remain an area of active research. (9,10) Potential factors may include genetic mutations, changes in the tumor microenvironment, or the influence of long-standing habits, such as tobacco use, as seen in Mr. Sankar's case.

Clinical Diagnosis and Management Challenges:

The clinical diagnosis of VC can be challenging, given its clinical resemblance to benign lesions. In Mr. Sankar's case, the delayed recognition of the initial whitish growth, coupled with the long-standing habits, further complicated the diagnostic process. The facial asymmetry and palpable lymph node indicated the locally aggressive nature of the lesion, prompting the need for comprehensive investigations.

The transition to Squamous Cell Carcinoma, as revealed by the histopathological findings, underscores the need for a multidisciplinary approach in the management of oral cancers. The shift in behaviour from a seemingly low-grade malignancy to a more aggressive form emphasizes the importance of vigilant follow-up and timely intervention.

Conclusion:

This case report provides valuable insights into the clinical and histopathological evolution of Verrucous Carcinoma progressing to Squamous Cell Carcinoma. Understanding the factors contributing to such transitions is crucial for refining diagnostic approaches, prognostication, and developing targeted therapeutic strategies.

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Additionally, emphasis on public health initiatives targeting tobacco cessation and lifestyle modifications remains imperative to curb the prevalence of oral cancers and their complications.

In conclusion, the comprehensive analysis of Mr. Sankar's case serves as a reminder of the complexities inherent in the diagnosis and management of oral malignancies. The integration of clinical, histopathological, and molecular insights is vital for improving patient outcomes and advancing our understanding of the diverse spectrum of oral cancers.

Conflict of Interest: NIL

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