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## Gingival squamous cell carcinoma in young patients: report of a case and review of the literature

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Squamous cell carcinoma is a malignant neoplasm of epithelium, most frequently occurring in intraoral tumors. In this article we describe a rarely reported, because the frequency of oral cancer in young people is extremely low, case of a 16-year-old Chinese girl with squamous cell carcinoma of anterior mandibular gingiva. The clinicopathologic features, etiology, clinical evaluation, management of squamous cell carcinoma of gingiva in young patients are discussed and the applicable literatures are reviewed. (*Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2009;107:696-700)

### CASE REPORT

A 16-year-old Chinese female patient complained of a painless mass in the anterior mandibular gingiva, which had gradually increased in size over the preceding 3 months. Being diagnosed as having epulis, the patient underwent a simple excision of the tumor in a local hospital in her hometown. One month later, the mass recurred in the same location with ulcerative surface. The patient then went to the Periodontal Department of the School and Hospital of Stomatology of Wuhan University, complaining of painful mass with unhealed ulcerative surface in the anterior mandibular gingiva. A biopsy was performed and the specimen diagnosed as well differentiated squamous cell carcinoma. The patient was immediately hospitalized in our department.

Clinical evaluation showed a 1.5 × 2 cm ulcerative mass with white pseudomembrane in the anterior mandibular gingiva, presenting with irregular borders. The root labial surface of mandibular right canine was exposed; the right canine and the lateral incisor were sensitive to percussion, suffering from slight mobility (Fig. 1). The oral cavity examination didn't show any odontogenic pathology. There were no palpable neck lymph nodes. The radiologic examination showed that the alveolar bone was eroded. Additionally, there was a broad area of well and poorly circumscribed radiolucency extending from mesial of tooth #22 to distal of tooth #27, with no evidence of alveolar crest involvement. There also appeared to be widening of the periodontal ligament (PDL) associated with tooth #27 as well as PDL and lamina dura destruction of several other teeth. (Fig. 2). However, no contributing factors in social history were found, such as smoking, alcohol intake,

or chemical exposure. There was no significant family history of malignancy or genetic or immunologic disease with predisposition.

Given the definitive diagnosis of malignancy, a metastatic work-up, including chest radiography, blood chemistry testing, etc., was performed before the operation. The results of all of these tests were within normal limits. The patient underwent extended gingival excision and segmental mandibular resection between premolar regions (from right premolar to left canine) with additional 1.5-cm margins under general anesthesia. Bilateral suprahyoid neck dissection was performed. Postoperative pathology confirmed the initial diagnoses (well differentiated squamous cell carcinoma [SCC]). There were no distinctive histologic features compared with typical adult SCC (Fig. 3). Postoperative radiotherapy and chemotherapy were not necessary, considering the patient's age (16 years) and diagnosis (well differentiated SCC). Prognosis was remarkable. Seventeen months' follow-up showed that there was no evidence of recurrence.

### DISCUSSION

Squamous cell carcinoma is a kind of epithelial tumor and the most common malignant tumor of the oral cavity.<sup>1</sup> Generally, a large variety of benign neoplasms can develop in the gingiva, clinically manifesting as a single slow-growing nodular lesion of variable size. These neoplasms tend to be painless and covered by a normal-appearing mucosa. The case presented here was SCC of the anterior mandibular gingiva. However, our initial impression was not SCC, because it is generally considered that oral cancer is most common in men in the sixth to eighth decades of life, and it is rare in patients <40 years old.<sup>2</sup> The frequency of oral cancer in young people is extremely low. Krolls et al.<sup>3</sup> showed in his extensive review that people <40 years old accounted for only 2.7% of patients presenting with oral cavity and oropharyngeal cancers. In their review of more than 1,000 patients, there were only 5 patients

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Fig. 1. The intraoral clinical view of the mandibular squamous cell carcinoma, showing  $1.5 \times 2$  cm ulcerative mass with white pseudomembrane in the anterior mandibular gingiva, with irregular borders. The labial root surface of the mandibular right canine was exposed; the right canine and the lateral incisor were sensitive to percussion and suffering from slight mobility.



Fig. 2. The panoramic x-ray examination, showing that the alveolar bone was eroded (*arrows*). Additionally, there was a broad area of well and poorly circumscribed radiolucency extending from mesial of tooth #22 to distal of tooth #27, with no evidence of alveolar crest involvement. There also appears to be widening of the periodontal ligament (PDL) associated with tooth #27, as well as PDL and lamina dura destruction of several other teeth.

<30 years old, among which just 1 patient <18 years old (a 10-year-old boy), who had a well differentiated SCC of the alveolus.

Lower gingival SCC is a relatively common type of intraoral malignancy with its own unique clinical significance. Because the thickness of gingiva overlying the alveolar bone does not exceed 2-3 mm, gingival SCC has a strong predilection for bone invasion.<sup>4</sup> Therefore, the majority of patients with lower gingival SCC already have bone invasion when they are first admitted.<sup>5</sup> Muller and Slootweg<sup>6</sup> described 2 basic patterns of bone involvement based on the alignment of the invading tumor: In the erosive pattern, the tumor advances on a broad front and sharp tumor bone interface, whereas the infiltrative pattern showed irregular focal infiltration by tumor cells into the cancellous bone.

The etiology of malignancies in general is considered to be multifactorial and based on the so-called cocarcinogenic theory, where intrinsic and extrinsic factors acting simultaneously or in succession are considered to be responsible for the development of malignant neoplasms. Among the intrinsic factors often mentioned are immunity, nutrition, age, heredity and DNA composition (proto-oncogenes and oncogenes). Contributing extrinsic factors associated to oral SCC include: tobacco use, either smoked or chewed in its various forms, actinic radiation, viral infections, especially with human papilloma viruses (HPV), Epstein-Barr virus, HIV, lichen planus, chronic infections such as syphilis and candidiasis, chronic irritation, and alcohol intake. Of all of these factors, the connection be-

tween the use of tobacco and oral cancer has been firmly demonstrated by a raft of statistical studies. Regarding smoking and alcohol habits, it has been estimated that smoking and alcohol consumption account for 75% of all cases of oral cancer. However, the significance of these risk factors among young patients is still controversial. Franceschi et al.<sup>7</sup> reported results of a case-control study showing that smoking is strongly associated with the development of oral cancer in older patients but is not generally considered to be a significant etiologic agent in younger patients. This view is shared by a number of descriptive studies.<sup>8,9</sup> Questions remain, however, as to factors associated with carcinomas in younger individuals.<sup>2</sup> Although exposure to behavioral risk factors is similar, in younger persons they have had less time to act, and yet the lesions are similar in terms of stage and pathology, although they are more commonly on the tongue.

There are no specific pathologic characteristics of carcinomas in young adults. The outcome of oral SCC in young patients does not appear to be different from that of the older population. For all age groups, clinical stage and the pattern of invasion were the most significant prognostic factors.

Clinically, it may be misdiagnosed because of its variable appearances. Carcinomas of the gingiva in particular tend to present with benign features, and this leads to delays in diagnoses or even to misdiagnoses.<sup>1</sup> The similarity of SCC of the gingiva to periodontal or periapical disease, such as pseudoepitheliomatous hyperplasia, pyogenic granuloma (PG), aggressive periodontitis, and acute necrotizing ulcerative gingivitis,

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