Determining the epidemiologic, outcome, and prognostic factors of oral malignant melanoma by using the Surveillance, Epidemiology, and End Results database

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Oral malignant melanoma (OMM) is a rare tumor of neural crest–derived melanocytes in the basal layer of the oral mucous membrane.[1-4] Primary mucosal melanomas of the head and neck are more rare than cutaneous melanomas and among those of the head and neck region, OMM constitutes 0.5% of oral neoplasms and 0.2% to 8% of all melanomas.[1,3-10] OMM is highly aggressive and has a greater tendency to metastasize and invade the surrounding tissues than do other malignant tumors of the oral cavity.[4]

Eighty percent of OMMs arise in the mucosa of the maxilla, with the most common sites being the keratinizing mucosa of the hard palate and the alveolar gingiva.[2,4,7-9,11-13] OMM occurs at a higher frequency in African Americans, the Japanese, and people from India, presumably because of the more common existence of melanin pigmentation in their oral mucosa.[1,4] Unlike cutaneous melanomas, OMM has been reported overwhelmingly to occur more in males than females,[1,2,4,5,7,10,11,14,15] with a male-to-female ratio of approximately 3:1.[4,7] However, Moore and Martin[16] reported an almost equal OMM sex distribution, whereas investigators in other studies demonstrated a sex distribution with mostly females.[17,18]

No specific etiologic factors have been identified for OMM.[1,4,19] Although investigators have suggested that tobacco use, chronic irritation from ill-fitting dentures, and alcohol consumption may play

ABSTRACT

Background. The authors conducted a retrospective analysis to determine the epidemiologic, outcome, and prognostic factors in patients with oral malignant melanoma (OMM).

Methods. The authors used the US National Cancer Institute's Surveillance, Epidemiology, and End Results database to analyze patients with OMM from 1973 to 2012. Study variables included age, sex, race, decade of diagnosis, extent of disease, tumor size, treatment modality, and socioeconomic status (SES).

Results. The search identified 232 patients with OMM. Overall survival (OS) and disease-specific survival (DSS) were 25% and 40%, respectively, at 5 years. Age (OS, $P = .004$; DSS, $P = .294$), surgical resection (OS, $P = .046$; DSS, $P = .005$), and extent of disease (OS, $P < .001$; DSS, $P < .001$) were independent survival determinants; tumor size was an independent predictor of OS ($P = .085$). For confined and locally invasive disease, surgery (OS, $P = .001$; DSS, $P = .004$) and size (OS, $P = .154$; DSS, $P = .007$) were independent determinants of OS and DSS. For metastatic disease, surgery (OS, $P = .675$; DSS, $P = .518$) was a survival determinant for both OS and DSS, whereas radiotherapy predicted improved OS (hazard ratio, 0.18; 95% confidence interval, 0.03 to 0.99; $P = .049$).

Conclusions. Age at diagnosis, decade of diagnosis, extent of disease, tumor size, and SES are prognostic factors related to OMM survival. Surgical resection and radiation therapy both improve OMM survival.

Practical Implications. Early and detailed examinations for OMM are critical to improving the survival rate in patients with OMM, especially in older patients and patients of lower SES.

Key Words. Cancer; epidemiology; mouth neoplasms; oral and maxillofacial disease; oral cancer.

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TABLE 1

Patient demographic characteristics, tumor characteristics, and treatment modality.

CHARACTERISTIC	PERCENTAGE OF PATIENTS
Age, y	
< 50	16.8
50-69	37.5
≥ 70	45.7
Sex	
Male	47.8
Female	52.2
Race	
White	79.3
African American	5.2
Asian or Pacific Islander	8.6
Native American	3.9
Other or unknown	3.0
Decade of Diagnosis	
1970s	3.4
1980s	12.9
1990s	13.4
2000s	70.3
Primary Site*	
Lip	5.2
Tongue	9.1
Gingiva	30.6
Floor of mouth	2.2
Palate	39.2
Buccal mucosa	9.5
Mouth, not otherwise specified	4.3
Extent	
Localized	34.9
Regional	33.6
Distant	16.4
Unknown	15.1
Tumor Size, Centimeters*	
< 2	28.4
2-4	15.8
> 4	7.3
Unknown	48.3
Surgery Performed	
Yes	75.9
No	24.1
Radiation Therapy	
Yes	31.5
No	66.8
Unknown	1.7

* Percentages do not add up to 100% due to rounding.

roles, evidence for their correlation remains weak.[2,11,12,19,20]

Clinically, OMM is typically asymptomatic in the early stages, which may result in delayed detection and account for the poor prognosis of the disease.[1,4] Patients with OMM have a reported 5-year survival rate from 10% to 25%, with a mean survival rate of 18.5 months.[1,4] Because of the poor prognosis, especially in later stages of the disease, any pigmented lesion of uncertain origin should be biopsied to rule out malignancy. Incisional biopsy remains the method of choice for diagnosis.[1,4]

OMM exhibits aggressive behavior, vertical growth pattern, high risk of developing metastasis, and poor survival rates.[4] In the early stages, patients with OMM may seek care for pigmented growths or swelling.[4] In the later stages, common symptoms include ulceration, bleeding, paresthesia, and ill-fitting prostheses.[4] OMM also may be detected in the later stages by the presence of pain, ulceration and hemorrhage of the overlying epithelium, swelling, and loose teeth.[1] OMM may metastasize to regional lymph nodes, as well as distant sites such as the lungs, liver, brain, and bone.[1,2,4,11]

Early diagnosis of OMM requires a thorough review of the patient's history, physical examination, and examination of radiographic and histopathologic features. The conventional therapy for OMM is surgical excision with adequate negative margins and supplemental radiotherapy.[1,4] Adjunctive chemotherapy and immunotherapy may be performed to minimize distant metastasis of the tumor.[1] Chemotherapy, however, yields a low response rate.[14] Although dacarbazine is used to treat cutaneous melanomas, it has no effect on OMM.[21] When combined with interleukin-2, however, its effects may be beneficial.[21,22] Other immunotherapies are believed to reduce OMM tumor size by activating killer T cells and inhibiting suppressor T cells.[21] Recurrent OMM may develop 10 to 15 years after primary therapy,[4] with more than one-half of all recurrences and metastases occurring within 3 years.[23] Presence of distant metastasis may be monitored by means of chest radiography every 6 months after surgery.[24]

Investigators in a previous study using the population-based US National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) registry found anatomic primary site was a statistically significant predictor of survival for patients with mucosal melanoma of the head and neck, with tumors in the nasal cavity and oral cavity allowing higher patient survival rates than

ABBREVIATION KEY. **DSS:** Disease-specific survival. **OMM:** Oral malignant melanoma. **OS:** Overall survival. **SEER:** Surveillance Epidemiology, and End Results. **SES:** Socioeconomic status.