

Basal cell carcinoma on the vermilion lip: A study of 18 cases

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Basal cell carcinoma (BCC) involving the vermilion border and mucosal surface of the lips is rare, whereas these sites are more frequently involved by squamous cell carcinoma (SCC). The epithelium of the lip is divided into 4 regions: the skin; the vermilion border; the outer mucosa (vermilion); and the inner mucosa. The vermilion border contains the orbicularis oris muscle without a subcutaneous fat layer. It is devoid of hair follicles and sweat glands. During the aging process the upper lip lengthens, the teeth wear down, and the angle of the jaw opens, resulting in a reduction in the amount of outer mucosa, which is exposed to the sun. We present 18 cases of BCC, which involved predominantly the vermilion lip. In our study, we use the term “vermilion lip” to include the vermilion border and the outer mucosal surface of the lip (Fig 1). The clinical presentation and histopathology of these cases were reviewed and characterized. (Figs 2-7).



Fig 1. Vermilion lip.

MATERIALS AND METHODS

We reviewed 18 cases of BCC on the vermilion lip diagnosed from October 1997 to October 2002 in a private Mohs micrographic surgery referral practice in Houston, Texas. There were 7027 cases of histopathologically confirmed BCC in that period. Only BCCs involving predominantly the vermilion lip were included in the study. These patients were called and asked about recurrence and a history of sunscreen use, cold sores, and smoking at the time

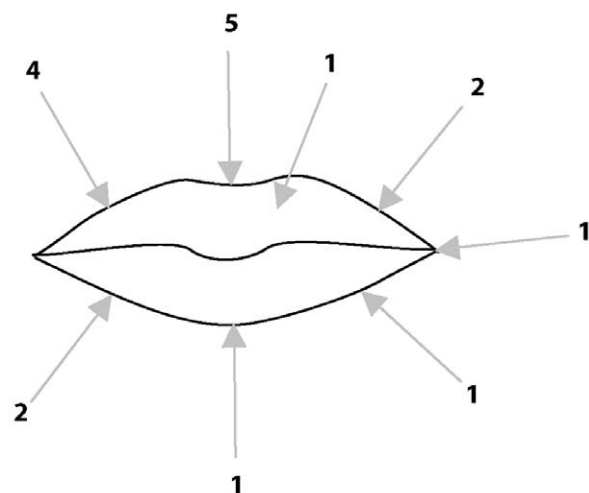


Fig 2. Number of cases of basal cell carcinoma of vermilion lip by anatomic site.

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of the study. Cases of BCC primarily involving the skin surface around the lip with an extension to the vermilion border were not included in this study.

Table I. Age and sex of patients, previous skin cancers, site of basal cell carcinoma, lymph-node involvement, and treatment

No. of cases	18
Average age (y)	64 (36-87)
F	60
M	68
Sex M: F	1:1
Previous skin cancer (BCC or SCC) at other sites (cases)	15
Site (cases)	
Upper vermilion lip	14
Lower vermilion lip	4
MMS (cases)	18
Number of MMS staging required for tumor extirpation	2.55 (1-7)
Lymph-node involvement (cases)	0
Wound closure (cases)	
Simple closure	11
Flap or second intention	7

BCC, Basal cell carcinoma; F, female; M, male; MMS, Mohs micrographic surgery; SCC, squamous cell carcinoma.



Fig 3. Basal cell carcinoma on vermilion lip of 45-year-old woman.

RESULTS

In all, 7027 cases of BCC at all body sites were diagnosed histopathologically during the 5 years. Of these, 18 (0.25%) were centered on the vermilion lip. The distribution of the BCCs in this study is illustrated in Fig 2. The clinical characteristics of the patients are shown in Table I. The clinical diagnosis was accurate in 17 of 18 cases. One case was clinically diagnosed as an SCC but was shown to be a BCC histopathologically. A total of 3 patients presented with BCC on the vermilion lip as their first skin cancer (Fig 3). Histopathologically, the tumors were either superficial, infiltrative, nodular, or morpheic types (Fig 4). There was evidence of tumor infiltration of the nerve, muscle, or vessels in 6 of the 18 cases (Table II and Figs 5 through 7).

We were able to contact 15 of the 18 patients at the period of this writing. There were no recurrences in any of the 15 cases. The average follow-up time

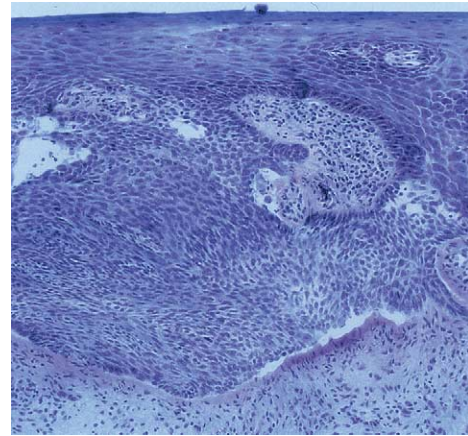


Fig 4. Superficial basal cell carcinoma attached to lower surface of mucosal epithelium. Clefting and mucopolysaccharide surrounding tumor cells is shown. (Toluidine blue stain; original magnification $\times 40$.)

Table II. Invasion of deeper structures

Invasion of various structures	Cases (18)
None	12
Invasion	
Perineural infiltration	1
Perineural and muscular infiltration	3
Perineural, perivascular, and muscular infiltration	2

was 38 months (4-67 months). A history of smoking, sunscreen use, and cold sores were obtained (Table III).

DISCUSSION

The distribution of malignant tumors of the lips is usually sharply divided between SCC of the lower lip and BCC of the upper lip. The lower vermilion lip is subjected to intense sun exposure and is the most common site of origin for SCC. In our study, 14 of the 18 cases of BCC were on the upper vermilion lip. If the histogenesis of BCC was entirely actinic or solar-related, one would have expected to see the distribution of the tumor more in favor of lower vermilion lip. The precise histogenesis of BCC on the vermilion lip is not clear. The concept of its origin from the pluripotential epithelial cells of the squamous mucosa and epidermis has been postulated.^{1,2} Their origin from a heterotopic sebaceous gland or a primary epithelial germ may be considered.³ The other possibility of origin may be from traumatic epithelial implantation.⁴

A limited number of BCCs involving primarily the vermilion border or outer mucosal surface of lip

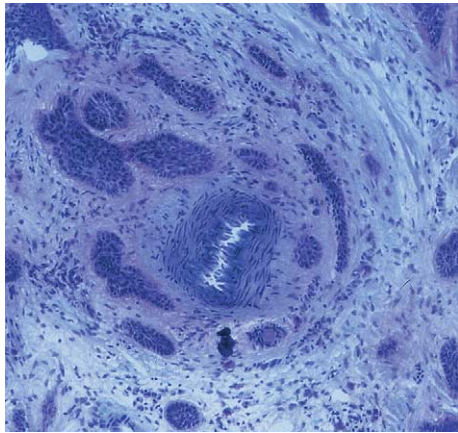


Fig 5. Small groups of basaloid cells infiltrating perivascular space of inferior labial artery. (Toluidine blue stain; original magnification $\times 40$.)

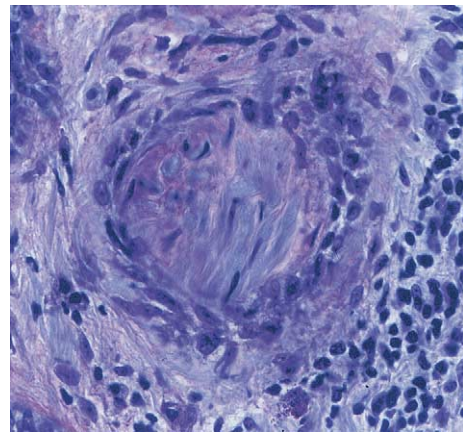


Fig 7. Basal cell carcinoma cells surround small nerve on lower lip.

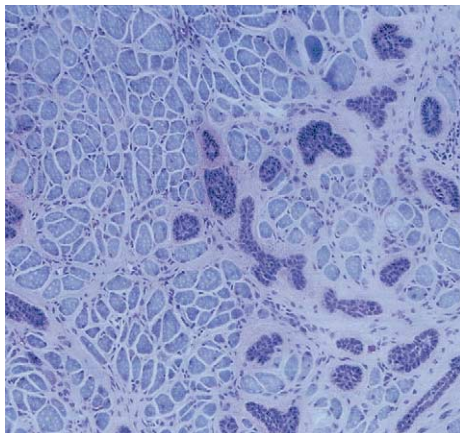


Fig 6. Small groups of basal cell carcinoma infiltrating orbicularis oris muscle. (Toluidine blue stain; original magnification $\times 20$.)

have been reported (Table IV). In 1949, Welton et al⁵ found 2 cases of BCC on the mucosal surface of the lower lip among 620 cases of BCC at all sites. In 1975, a retrospective review of 652 cases of BCC indicated that there were 3 cases of BCC on the vermilion mucosa.³ In 2001, 6 cases of BCC on the vermilion border of the lip were found from a review of 3477 cases of BCC diagnosed in a period of 11 years.⁶

BCC of the lips usually presents with ulceration or bleeding. The differential diagnosis of ulceration of the lip is shown in Table V. The ulceration and bleeding from BCC of the lips are commonly intermittent; much like that seen in herpes simplex. The most frequent diagnosis of ulceration of the lip is herpes simplex. It is not unusual for BCC of the lower lip to be initially diagnosed and treated as herpes simplex, acute or chronic.

Table III. History of smoking, sunscreen use, and cold sores

	Cases (15)
At the time of diagnosis	
History of smoking	
Nonsmoker	10
Ex-smoker	4
Smoker	1
History of sunscreen use	1
History of cold sores	7

Table IV. Previously reported cases of basal cell carcinoma on the vermilion lips

Authors	Year	Reported cases	Site
Welton et al ⁵	1949	2	Mucosal surface
Keen and Elzay ⁴	1964	1	Vermilion border and mucosal surface
Weitzner and Heutel ⁷	1968	1	Vermilion area
Weitzner ³	1975	3	Vermilion mucosa
Kelly et al ⁸	1975	1	Vermilion border
White et al ⁹	1980	1	Vermilion border
		1	Mucosal surface
Hume and Turner ¹⁰	1982	1	Mucosal surface
Oriba et al ¹¹	1998	3	Vermilion area
de Sousa et al ⁶	2001	6	Vermilion border

BCC of the vermilion lip is rare. In this location, the tumor appears to originate at the vermilion border and invades onto the rest of the vermilion lip. The contiguity of growth of BCC on the vermilion border onto the mucosal surface of the lip was clearly demonstrated from sequential Mohs layers in our cases.

Table V. Differential diagnosis of ulceration of the lip

Herpes simplex
Aphthous ulcer
Actinic cheilitis
Basal cell carcinoma
Squamous cell carcinoma
Trauma
Burn, bite, bumps, and factitial cheilitis
Lichen planus
Contact cheilitis

BCC invasion to deeper structures of the lips occurs early and is common in these cases. This could be explained by the proximity of the nerve and the muscle to the surface because of thinness of the submucosal layer of the lip, compared with glabrous skin at other parts of face. We recommend Mohs micrographic surgery as the treatment for BCC of the lips. Physicians treating BCC in the region of the vermilion lip should be aware of the possibilities of mucosal invasion and early deep spread.

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