Clinical Oral Medicine

Actinic cheilitis: clinical and pathologic characteristics in 65 cases

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OBJECTIVE: The purpose of this study was to determine the clinical and histopathologic presentation of actinic cheilitis.

STUDY DESIGN: A retrospective study on 65 patients attending an Oral Medicine clinic in Greece over a 10 year period. For each case the demographic, clinical and histopathologic information were evaluated.

RESULTS: The mean age at the time of diagnosis was 53.1 \pm 11.4 years. Thirty-nine patients (60%) used tobacco in any form. An outdoor occupation was indicated for 43 (66.2%) patients. The location of the lesions of actinic cheilitis was in all cases on the lower lip. Actinic cheilitis appeared in three forms; white non-ulcerated lesions (29%), erosions or ulcers of the lip (48%), mixed white and erosive (23%). The histopathologic characteristics included increased thickness of keratin layer, alterations of the thickness of spinous cell layer, epithelial dysplasia, connective tissue changes, perivascular inflammation and basophilic changes of connective tissue. In 11 cases (16.9%) the presence of squamous cell carcinoma was observed.

CONCLUSIONS: This case-series highlights varied clinical presentation of actinic cheilitis among whom a high proportion developed squamous cell carcinoma. *Oral Diseases* (2004) **10**, 212–216

Keywords: actinic cheilitis; lip mucosa; keratosis; lip cancer

Introduction

Actinic cheilitis is a pathologic condition affecting mainly the lower lip and it is caused by chronic and excessive exposure of the lips to the ultraviolet radiation in sunlight. Although actinic cheilitis is a recognized precancerous lesion of the lip, not enough studies in the literature have examined its clinical and histopathologic spectrum.

The purpose of this retrospective study was to evaluate the clinical, demographic and histopathologic findings in 65 patients with actinic cheilitis.

Materials and methods

All cases with a diagnosis of actinic cheilitis from January 1993 to January 2003 were retrieved from the diagnostic pathology files of the Department of Oral Medicine and Pathology.

Demographic data, clinical features and histopathologic characteristics were recorded in each case. Histological sections were reevaluated by one of the authors (A.M.).

For inclusion in the study, the following criteria were required: (1) a white or erosive lesion clinically located on the lip; (2) epithelial change equal to or greater than mild epithelial dysplasia and (3) basophilic changes of the connective tissue. Basophilic changes are characterized by the replacement of eosinophilic collagen by an amorphous basophilic granular material. Blood vessels in these regions are usually dilated.

Demographic data that were recorded were the age, the gender, the job and the ethnicity of each patient.

Clinical features that were evaluated were the location and the form of the white lesion or the erosion, the coexistence of other clinical findings or lesions and the presence of predisposing factors.

In general the patients were seen four times a year. In case of changes during the follow-up period the lesions were re-photographed and depending on the clinical indication a biopsy was obtained.

Histopathological characteristics that were evaluated included the presence and the degree of epithelial keratinization, the thickness of the spinous cell layer, the presence and the degree of epithelial dysplasia or the development of squamous cell carcinoma, connective tissue changes, such as inflammation or presence of basophilic changes. In all cases the staining method was Hematoxylin–Eosin staining.

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Results

Sixty-five patients were found in the database over a 10-year period. The mean age at the time of diagnosis was 53.1 ± 11.4 years (men 53.2 and women 51.4 years). All the patients were white people and no other ethnic group was represented.

Thirty-nine patients (60%) were cigarette smokers. An outdoor occupation was indicated for 43 (66.2%) patients. Twenty-seven of those patients were farmers, 12 were working in building construction and four were fishermen. Twenty-eight outdoor workers were smokers.

The range of the follow-up period was 0.3–10 years (mean: 4.1 years).

The demographic data of the patients are presented in Table 1.

The location of the lesions of actinic cheilitis was in all cases on the lower lip. In several cases (n = 30, 46.1%) the lesions were restricted towards the right side of the lip.

Actinic cheilitis appeared in 19 patients (29.2%) in the form of white, non-ulcerated lesions (Figure 1). In thirty-one patients (47.7%) cheilitis manifested as erosions or ulcers of the lip (Figure 2), while in 15 cases (23.1%) erosions and ulcers co-existed with white lesions or atrophic areas of the lower lip (Figure 3, Table 2).

In 11 cases (16.9%) the presence of squamous cell carcinoma was observed (Table 2). In nine of these patients the presence of squamous cell carcinoma was

Table 1 Demographic data of 65 patients with actinic cheilitis

	Number of cases (%)
Males	60 (92.3)
Females	5 (7.4)
Mean age (years)	53.1 ± 11.4
Cigarette smokers	39 (60.0)
Out-door occupation	43 (66.2)
Out-door occupation + smoking	32 (49.2)



Figure 2 Actinic cheilitis presenting with the form with erosive and fissured lower lip



Figure 3 Erosions co-exist with white lesions or atrophic areas of the lower lip in this actinic cheilitis patient

Table 2 Clinical characteristics in 65	patients	with	actinic	cheilitis
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	White lesion (%)	Erosion- ulcer (%)	Mixed (%)	Duration (mean, years)	Development of SCC (%)
No. of cases	19 (29.2)	31 (47.7)	15 (23.1)	1.6	11 (16.9)



Figure 1 Actinic cheilitis in the lower lip of a male patient. A welldefined white lesion of variable thickness is seen

detected at the initial examination, while two patients manifested malignant transformation in a follow up period of 2.4 and 2.8 years respectively (Figure 4).

The demographic and clinical characteristics of these patients are presented in Table 3.

The histopathological findings of actinic cheilitis patients are presented in Table 4 and are illustrated in Figures 5–7.

Discussion

The early signs of sun damage to the lip are subtle and the degree of clinical change is not necessarily related to the amount of either epithelial or connective tissue 213



Figure 4 An infiltrating squamous cell carcinoma developed on actinic cheilitis lesion is seen

 Table 3 Demographic and clinical characteristics in 11 patients with actinic cheilitis who developed squamous cell carcinoma

Patient	Gender	Age at presentation	Cigarette smoking	Outdoor job	Time from onset of actinic cheilitis (years)	Type of lesion
1	Male	59	Yes	Yes	-	Erosive
2	Male	60	Yes	Yes	2.8	Erosive
3	Male	68	Yes	Yes	-	Mixed
4	Male	72	Yes	Yes	-	White
5	Male	41	Yes	No	-	Erosive
6	Male	50	No	Yes	-	Erosive
7	Male	51	Yes	No	-	Erosive
8	Male	70	Yes	Yes	2.4	Mixed
9	Male	46	Yes	Yes	_	Mixed
10	Female	47	No	Yes	_	Erosive
11	Male	41	Yes	Yes	-	White

-, Unknown.

damage (Kaugars *et al*, 1999). To our experience almost one half of the patients with lip cancer have lesions > 1.0 cm in diameter at the time of their initial diagnosis. Therefore the issue of the early diagnosis of actinic cheilitis is important.

Diagnosis of actinic cheilitis is mainly based on demographic, clinical and histopathologic findings.

Starting from demographic findings the classical profile as it is reported in the literature, for a patient

at high risk for actinic cheilitis is a Caucasian man older than 50 years of age, who uses tobacco (Cataldo and Doku, 1981) and has a history of chronic exposure to the sun (Lundeen *et al*, 1985, Nicolau and Balus, 1964, Main and Pavone, 1994). Our results agree with this profile of an actinic cheilitis patient.

From the clinical histories that were available, in most cases the right side of the lower or upper lip was affected more frequently. In several cases (n = 30, 46.1%) the white lesions or erosions were restricted towards the right side of the lip. A possible reason for the preference of lesions to the lower lip may be that the lip has less protection than the skin because the epithelium is thinner, lacks the thicker keratin covering of skin, in white populations has less melanin, and has fewer secretions from sebaceous and sweat glands (Nicolau and Balus, 1964). However, these are not the only causes. Cigarette smoking may have played a role in the preferential occurrence for the right side, because most of the 30 patients with known histories of smoking reported that they preferred the right side to hold their cigarette.

Our results also reflect that combination of smoking and outdoor working is related with actinic cheilitis. Smokers working inside or outside were almost equal.

Actinic cheilitis may appear clinically with localized or diffused lesions. The lesions are usually asymptomatic and they are white, red, or white with interspersed areas of red in color. Whitish areas usually represent hyperkeratotic lesions, while red erosive or atrophic lesions confers chelitis. Most of our cases (n = 31, 47%) appeared clinically with the erosive form. On palpation these lesions give the sense of a gloved sliding finger on fine sandpaper (Kaugars *et al*, 1999). Palpation is also important for the differential clinical diagnosis between actinic cheilitis and squamous cell carcinoma.

Our study showed an association with malignancy in 16.9% of the cases of actinic cheilitis. This rate however may not reflect the true rate of malignant transformation for two reasons: (1) because of the relatively low number of patients in our study and (2) because we did not review our cases diagnosed as squamous cell carcinoma of the lip during the time period of the study to determine how many of them demonstrated actinic cheilitis changes.

The majority of these patients were males in their fifth decade, they had outdoor jobs and were smokers. Most

	No. of cases (%)					
Histopathological characteristic	Negligible	Mild	Moderate	Severe		
Increased thickness of keratin laver	9 (13.8)	22 (33.8)	20 (30.8)	14 (21.6)		
Parakeratosis/orthokeratosis	27 (41.6)	()	8 (12.3)	30 (46.1)		
Increased thickness of spinous cell layer	16 (24.6)	20 (30.8)	14 (21.6)	12 (18.4)		
Atrophy of the spinous cell layer	0	0	3 (4.6)	0		
Epithelial dysplasia	0	18 (27.7)	20 (30.8)	16 (24.6)		
Invasive squamous cell carcinoma		()	()	11 (16.9)		
Connective tissue inflammation	8 (12.3)	22 (33.8)	17 (26.2)	18 (27.7)		
Perivascular inflammation	30 (46.1)	14 (21.6)	11 (16.9)	10 (15.4)		
Basophilic changes of the connective tissue	0	28 (43.1)	18 (27.7)	19 (29.2)		

Table 4 Histopathological characteristics in65 patients with actinic cheilitis



Figure 5 Photomicrograph showing a biopsy from actinic cheilitis lesion. Most prominent is the hyperkeratotic and parakeratotic epithelium. (H&E staining, original magnification ×120)



Figure 6 Photomicrograph showing a biopsy from actinic cheilitis lesion. Hyperkeratotic epithelium with severe epithelial dysplasia and inflammatory infiltration of the lamina propria is apparent. (H&E staining, original magnification $\times 120$)

of them (54.5%) presented clinically with an ulcer of the lip that had a mean duration of 2.6 years. Oral cancer is generally painless and that explains why patients may delay before seeking professional help (Batsakis, 1979, Silverman, 1998).

A finding of this study was that a 13.8% of our patients manifested a negligible hyperkeratosis. This finding may mean that the initial damage takes place in the basal cell layer.

A significant proportion (27.7%) of the patients in our study histopathologically had only mild epithelial dysplasia, while the remaining (72.3) had moderate dysplasia to invasive squamous cell carcinoma. This finding means that these patients necessarily need continued clinical monitoring and patient education with regard to protecting their lips from further sun damage. Another conclusion is that the clinician should not treat actinic cheilitis only on the basis of its clinical appearance but also he always should be aware of its histopathological characteristics. Biopsy is absolutely indicated for lesions that have developed substantial



Figure 7 Lower half of epidermis shows parabasilar hyperplasia and mild epithelial dysplasia. Underlying fibrous connective tissue is characterized by basophilic appearance. (H&E staining, original magnification $\times 200$)

thickness, induration of the base, or ulceration (Sober and Burstein, 1995) to exclude any malignancy and also remains the gold standard for diagnosis of oral precancer (Warnakulasuriya, 2000).

Other histopathologic findings in our study included increased thickness of keratin layer, parakeratosis/ orthokeratosis, increased thickness or atrophy of the spinous cell layer, connective tissue inflammation, perivascular inflammation and basophilic changes of the connective tissue.

Basophilic changes of the connective tissue are a constant finding in actinic cheilitis. This histological change is because of the replacement of collagen by an amorphous basophilic material (Lever and Schaumburg-Lever, 1990, Marks, 1993). The vessels in the regions of basophilic changes are usually dilated (Murphy, 1995).

Conclusively, the presence of any of the above clinical and histopathologic changes in conjunction with the aforementioned demographic data (sun exposure and smoking) is suggestive for actinic cheilitis and should prompt the clinician for a close evaluation, treatment and follow-up of the patient.

There is uniform agreement that actinic cheilitis should be treated soon after diagnosis.

The available treatment methods for actinic cheilitis can generally be divided into surgical and non-surgical Characteristics of actinic cheilitis A Markopoulos et al

methods. Surgical treatments include excision, cryosurgery, curettage (either alone or combined with electrodessication), and laser surgery (Schwartz, 1996, Barnaby et al, 1997). Non-surgical treatments include topical chemotherapy (fluorouracil or masoprocol creams), chemexfoliation (also known as chemical peels), and dermabrasion (Dufresne and Curlin, 1997). Newer treatments whose role has not yet been established definitively include topical or systemic retinoids, intralesional injection of α -interferon, and photodynamic therapy (Ehlert and Orfanos, 1989).

References

- Barnaby JWJ, Styles AR, Cockerell CJ (1997). Actinic keratoses: differential diagnosis and treatment. Drugs Aging 11: 186-205.
- Batsakis JG (1979). Squamous cell carcinomas of the oral cavity and the oropharynx. In: Tumors of the head and neck clinical and pathological considerations. Williams & Wilkins: Baltimore, pp. 144–176.
- Cataldo E, Doku HC (1981). Solar cheilitis. J Dermatol Surg Oncol 7: 989-995.
- Dufresne RG Jr, Curlin MU (1997). Actinic cheilitis. A treatment review. Dermatol Surg 23: 15-21.
- Ehlert R, Orfanos CE (1989). Local administration of vitamin A acid in chronic actinic cheilitis. Hautarzt 40: 728.

- Kaugars GE, Pillion T, Svirsky JA et al (1999). Actinic cheilitis. A review of 152 cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 88: 181-186.
- Lever WF, Schaumburg-Lever G (1990). Degenerative diseases. In: Histopathology of the skin. JB Lippincott: Philadelphia, pp. 298-300.
- Lundeen RC, Langlais RP, Terezhalmy GT (1985). Sunscreen protection for lip mucosa: a review and update. J Am Dent Assoc 111: 617-621.
- Main JHP, Pavone M (1994). Actinic cheilitis and carcinoma of the lip. Can Dent Assoc J 60: 113-116.
- Marks VJ (1993). Actinic keratosis: a premalignant skin lesion. Otolaryngol Clin North Am 26: 23-35.
- Murphy GF (1995). Dermatopathology: a practical guide to common disorders. WB Saunders: Philadelphia, p. 342.
- Nicolau SG, Balus L (1964). Chronic actinic cheilitis and cancer of the lower lip. Br J Dermatol 76: 278-289.
- Schwartz RA (1996). Therapeutic perspectives in actinic and other keratoses. Int J Dermatol 35: 533-538.
- Silverman S Jr (1998). Epidemiology. In: Oral cancer. BC Decker: Hamilton, Ontario, pp. 1-6.
- Sober AJ, Burstein JM (1995). Precursors to skin cancer. Cancer 75: 645-650.
- Warnakulasuriya S (2000). Lack of molecular markers to predict malignant potential of oral precancer. J Pathol 190: 407-409.

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