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Referral Patterns of Patients with Oral Squamous Cell Carcinoma, Australia

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Early diagnosis is an important factor affecting the prognosis of patients with oral cancer. Delays in diagnosis have been variously reported as being linked to the patient, the clinician or both. The purpose of this study was to investigate the referral patterns of patients with oral cancer by medical and dental practitioners, in order to assess the delays in diagnosis and to establish the reasons for these delays. 51 consecutive patients diagnosed with oral mucous membrane squamous cell carcinoma were retrospectively reviewed. In this study it was found that over one-third of the patients (38%) delayed seeking professional advice for more than 3 months after first being aware of the lesion. Initial delays in diagnosis of oral cancer was identified in one-third of the cases (17 patients), with antimicrobial medications prescribed and denture adjustments constituting the most frequently administered inappropriate therapy. General medical practitioners were more likely to encounter and refer patients with more advanced (T4) primary oral cancers than their dental colleagues. The findings of this study raise the concern that lack of patient awareness and inappropriate clinical management prevails in a community that should be better informed.
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INTRODUCTION

APART FROM skin, oral mucosal squamous cell carcinomas (OMSCC) are amongst the most accessible and most readily detectable malignant lesions. Langdon *et al.*, [1] reported that half of patients with OMSCC presented with advanced lesions. Prognosis and long-term survival is dependent on early recognition of the malignant disease [2] which otherwise has a high mortality rate. OMSCC is usually asymptomatic in the early stages and may mimic common non-neoplastic conditions. Berlin [3] considered the major problem of OMSCC detection was the frequent lack of symptoms and a consequent delay in instituting early diagnostic investigations.

Delays from the time of onset of signs and symptoms to time of diagnosis have been variously reported in the literature to be linked with the patient, the clinician or both. A North American study of 779 patients with OMSCC [4] revealed that 115 (14.8%) had a significant delay in diagnosis or inappropriate therapy because of failure to recognise or suspect malignant disease by physicians, dentists and patients. A contemporary British survey [5] reflected similar findings of substantial delays in diagnosis of oral cancer by both medical and dental practitioners despite an earlier report [2] which emphasised the dangers of delays in diagnosis.

Scully *et al.* [6] found that the most common reason for delay was due to clinicians, particularly general medical practitioners. Perriman [7] mentioned that ignorance and fear of cancer, as a result of lack of public awareness of the nature of OMSCC, were major obstacles contributing to the delay by patients in seeking medical treatment. Pogrel [8] found that over 50% of patients with symptoms eventually found to be due to OMSCC waited 3 months or longer before seeking professional assistance. In a review of 189 cases, Gardner *et al.* [9] found that the average time from the first symptom to treatment was approximately 9 months, with a range of 10 days up to 9 years. More recent studies [10–12] have shown the mean time delay between the first symptoms and diagnosis of OMSCC ranged from 3 to 5 months.

The purpose of this study was to investigate the referral patterns by medical and dental practitioners of patients eventually diagnosed as having OMSCC in Victoria, Australia where community health education and clinical services are relatively well developed.

PATIENTS AND METHODS

Hospital records of 51 consecutive patients with an eventual diagnosis of OMSCC who were referred to The Royal Dental Hospital of Melbourne (RDHM) by general medical and dental practitioners. These patients were treated at the Royal Melbourne Hospital or the Peter MacCallum Cancer Institute and were retrospectively reviewed. The study was approved by the Ethics in Clinical Research Committees of the hospitals.

Data relating to the sources and delays in patient referrals as well as clinical information concerning each OMSCC were recorded. The study focussed on the management of each patient from the time a "change" was first noticed in their mouths to the time they first sought professional advice. Types of changes first noted by each patient, dates and number of consultations prior to a definitive diagnosis and pertinent comments in referral letters were documented. The date of the definitive diagnosis was taken as the day of a positive pathology report.

The TNM system of tumour classification [13] and staging was used to describe the extent of clinical disease at the time of diagnosis.

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The data was recorded on a computer format questionnaire under the following headings; patient details, high risk factors, referral history and characteristics of the disease at the time of biopsy. Each of the variables relating to the information sought was abbreviated. The data was numerically coded for subsequent analysis. The results obtained were either tabulated or graphed. All percentage figures were rounded to the nearest whole number.

RESULTS

Of the 51 patients, 29 (57%) were male and 22 (43%) were female. The ages ranged from 21 to 90 years with a mean of 66 years (Fig. 1). Females (mean age, 72 years) in this study were on average 10 years older than males (mean age, 62 years).

Over 68% (35/51) of the patients in this study smoked tobacco and of these 83% smoked filtered cigarettes. The average duration of tobacco consumption was 36 years with a mean of 29 cigarettes smoked per day. Of the 35 patients with a smoking history, 15 (43%) had stopped smoking prior to the diagnosis of OMSCC. Alcohol was consumed by 75% (38/51) of the patients in this study, however, only 23 (45%) admitted to being regular and frequent drinkers. From Fig. 2, it can be seen that those who smoked heavily (i.e. in excess of 30 cigarettes per day) also consumed alcohol on a regular and frequent basis. Of those patients who smoked less than 30 cigarettes per day, almost half were regular drinkers. In 14% (7/51) cases there were no obvious risk factors identified.

The most common site for OMSCC was found to be the anterior two-thirds of the tongue (24%, 12/51), particularly the lateral margins and ventrum. This was followed by the mandibular alveolus (20%, 10/51), floor of the mouth (18%, 9/51) and the retromolar trigone (12%, 6/51). The cheek mucosa, labial mucosa, palate and maxillary alveolus were less commonly involved sites and made up the remaining 28% of lesions, in descending order of frequency.

The size of the primary OMSCC on initial presentation was described according to the UICC (1987) classification for oral

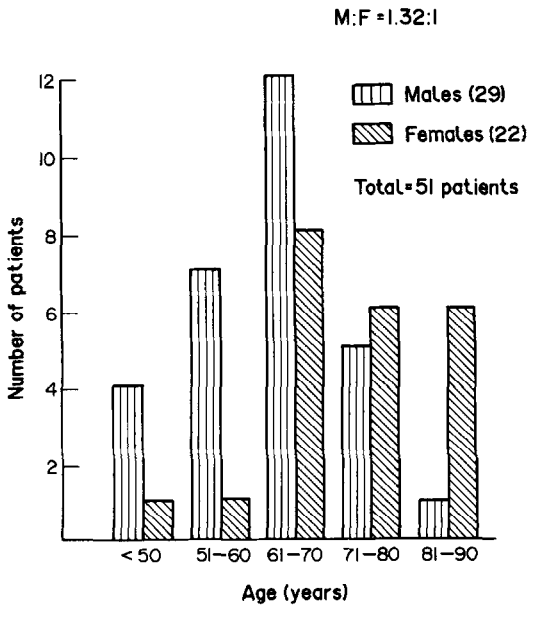

Fig. 1. Age and sex distribution.

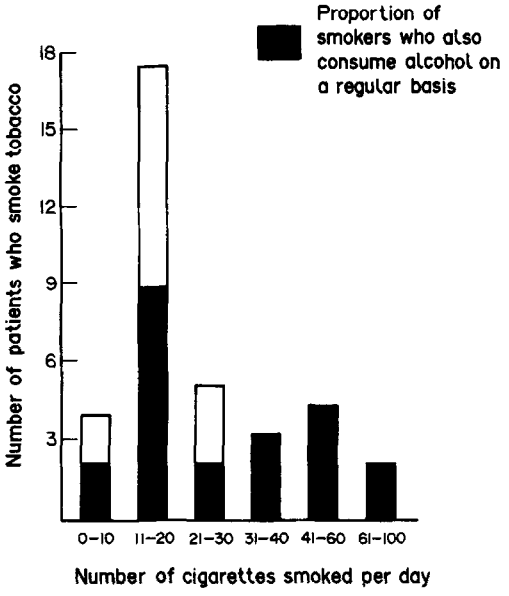

Fig. 2. Tobacco and alcohol consumption.

cancers. The majority of tumours (45%, 23/51 cases) presented with T4 lesions, that is, tumours which extended into underlying tissue planes (e.g. bone or underlying muscle). 25% (14/51) of cases presented as T1 OMSCC, or OMSCC that were less than 2 cm in the greatest dimension. There were 22% (11/51) cases with T2 OMSCC and 6% (3/51) of cases of T3 lesions (Table 1). T1S, carcinoma *in situ*, lesions were not identified in this series nor were TX lesions, because adequate assessment of primary lesions was undertaken in all cases.

Delay by patients was recorded as the time from the first onset of the signs and/or symptoms of the disease to the time of the patient's first consultation with either a medical or dental practitioner. The delay by patients in seeking professional assistance (Table 2) ranged from 6 days to 8 years. In this study there were two outstanding cases, one of 5 years and one of 8 years delay by patients in seeking treatment for lesions which have been reported to be present for the respective lengths of time mentioned. By excluding these two remarkable cases, the mean delay by patients in seeking professional assistance was found to be approximately 5 months (Table 2).

Almost two-thirds of the patients presented to their clinician within 2 months of the onset of signs/symptoms related to

Table 1. Tumour presentation

Tumour size		
T1	14 cases	(27.5%)
T2	11 cases	(21.5%)
T3	3 cases	(5.9%)
T4	23 cases	(45.1%)
Cervical nodes		
Clinically Positive		21 cases
Clinically Negative		30 cases
Histopathology		
Well differentiated SCC		25
Moderately differentiated SCC		18
Poorly differentiated SCC		3
Undifferentiated		1
Level of differentiation not recorded		4

Table 2. Delays in diagnosis

Delay by patients in seeking professional assistance	
Range:	6 days to 8 years
Mean:	134 days (approximately 4.5 months)
Delay by clinicians in establishing definitive diagnosis of oral cancer	
Range:	2 days to 3.2 years
Mean:	58 days (approximately 2 months)
Number of consultations prior to definitive diagnosis of oral cancer	
Range:	2 to 10 visits
Mean:	4.2 visits

their malignant disease. As illustrated in Fig. 3, the majority of patients with T1 lesions presented within a week of first being aware of the presence of an oral lesion, whereas those patients with larger primary tumours showed a tendency towards delaying their first visit to a clinician. Those with T2 or T3 lesions were more inclined to delay their first visit (>6 months) to their clinician or hospital than those patients who eventually presented with T4 lesions (1–3 months).

Delay in diagnosis was measured as the time delay from the patient's first consultation with a clinician to the date when the histological diagnosis of OMSCC was made. Delays ranged from as little as 2 days, to 3.2 years (Table 2). The mean delay in diagnosis by clinicians in this study was found to be approximately 2 months. The number of clinical consultation prior to definitive diagnosis ranged from two visits to more than 10 visits with a mean of four visits (Table 2).

More than half of the patients (57%) had the diagnosis of OMSCC confirmed histologically within 2 weeks of their first presentation. In a small number of patients (18%), 2 months elapsed from their initial presentation for a diagnosis of

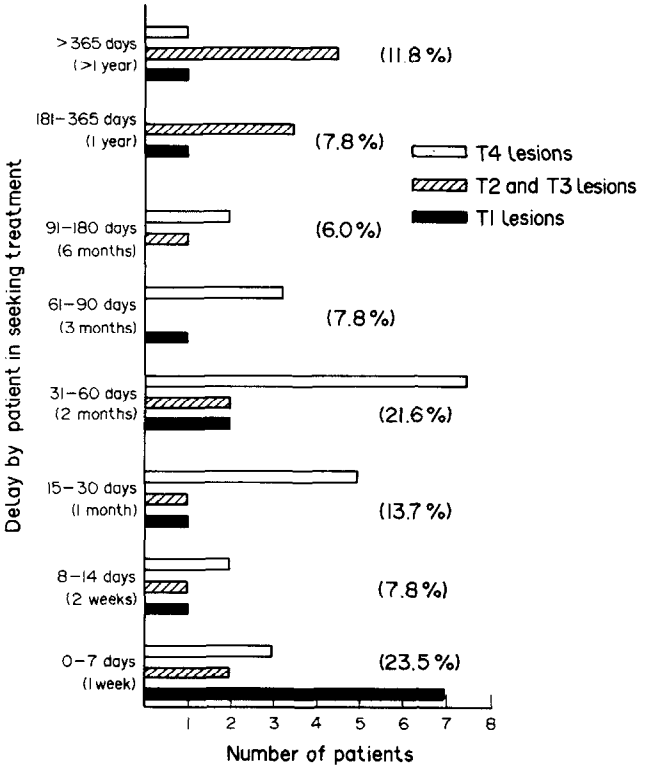

Fig. 3. Delay by patients.

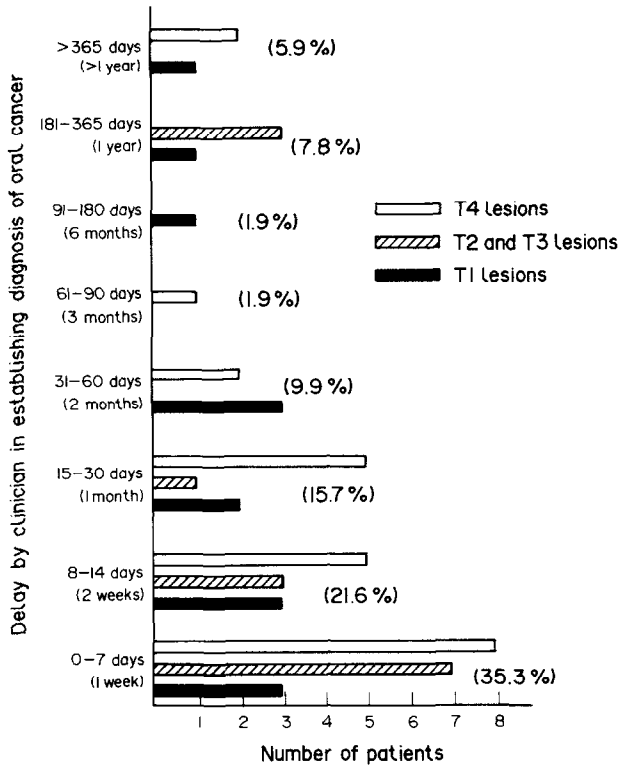

Fig. 4. Delay by clinicians.

OMSCC to be confirmed. As illustrated in Fig. 4, of those OMSCC confirmed within 1 month of initial presentation, larger lesions (i.e. T4) were diagnosed earlier than the smaller T1 lesions. In the cases of substantially delayed diagnosis (>2 months), the size of the primary lesions appeared to have no bearing on the extent of the delay.

Of the patients in this study, 67% (34/51 patients) were promptly referred for specialist advice on their first visit to a clinician. Included amongst this group of patients were 11 cases where the OMSCC was detected as an incidental finding by the clinician on routine oral examination. The remaining 33% (17/51) cases were found to have been managed initially by inappropriate treatment. As outlined in Table 3, the most commonly employed ineffectual therapies were the prescription of antimicrobial medications and denture adjustments. Dental extractions were performed in 7/51 cases. 5 patients, had multiple ineffective therapies adminstered prior to referral.

49% (25/51) of patients had referrals from general dental practitioners. General medical practitioners referred approximately one-quarter (24%, 12/51) of the patients and the remaining 28% (14/51) presented directly to The Royal Dental Hospital of Melbourne. The proportion of patients referred from general medical practitioners who presented with advanced OMSCC (75% with T4 lesions) was found to be greater than the proportion of patients with advanced OMSCC (40% with T4 lesions) referred from general dental practitioners (Fig. 5). On the other hand, 50% of patients with T1 lesions presented directly to the hospital. In this group 71% were found to have OMSCC as incidental findings on routine oral examination.

There were 38 cases for whom referral letters were available. 53% mentioned a history of the lesion whilst 66% of the letters

Table 3. Misdiagnosis of oral cancer patients

Treatment	No. of patients
Antimicrobial therapy	11
Denture adjustment	11
Tooth extraction	7
Mouthwash	5
Antifungal therapy	4
Reassurance and discharge	2

Initial misdiagnosis of patients with oral mucosal squamous cell carcinoma was detected in 17/51 cases where the above inappropriate treatment was provided. There was some overlap due to multiple treatment regimes provided for individual patients in some instances.

contained a description of the primary tumour in terms of size, site and appearance. Only 16% of the letters mentioned the possibility that the lesion may have been malignant. Generally, the referral letters were very brief and many were deficient in basic information that would suggest the presence of malignant disease.

DISCUSSION

Despite the relatively small sample size of 51 patients, the age and sex distribution in this study reflected similar findings with the patient characteristics of a larger study by Rich and Radden [14] of 244 cases derived from the same Oral Pathology Biopsy Service of The Royal Dental Hospital of Melbourne. The pattern of distribution of sites reported in the present study is otherwise similar to Caucasian populations of other western societies [15].

The mean delay by patients in seeking treatment was found to be 4.5 months. Table 4 shows the findings of previous studies related to the delay by patients in seeking professional assistance. The proportion of patients who delayed their first visit to a health professional for greater than 3 months ranged from 46% [5] to as high as 68% [16]. The present study showed that a smaller proportion of patients (38%) presented more than 3 months after the first onset of signs and

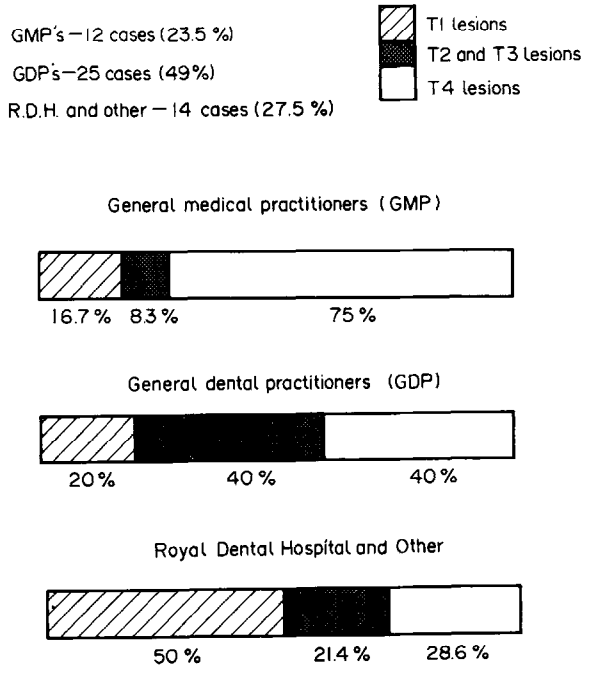

Fig. 5. Sources of oral cancer referrals.

Table 4. Delay by patients in seeking treatment

Reference	No. of patients in study	>3 months delay (%)
17	778	50.0
8	130	52.0
18	61	65.6
19	904	55.0
5	50	46.2
16	926 (Vic population)	55.6
	108 (RDHM)	68.0
14	244	60.0
Present study	51	37.5

symptoms of oral cancer than had been found in previous studies mentioned (Table 4). The relatively small sample size of this study makes it unwise to claim too much from comparisons with larger studies but, nevertheless, the result [3] may reflect an increased awareness of oral cancer in the community studied.

It was not surprising to find that most patients who presented earlier to their clinician for treatment had smaller primary tumours. It appeared that patients with T2, T3 and T4 primary tumours had a tendency to delay their first visit. Although patients with T1 lesions presented to their clinician earlier than patients with larger primary tumours, it was most interesting to find that patients with T2 and T3 lesions showed a tendency to further delay their first visit to a health professional than patients with T4 lesions. One explanation for this finding may be that T4 tumours have a more dramatic presentation than smaller tumours, thus prompting a sense of awareness in patients. It seems likely that the rate of growth of a tumour rather than its duration, influences the perceived urgency for presentation.

The results of the present study indicated that a delay in reaching a definitive diagnosis lead to inappropriate treatments such as the prescription of antimicrobial therapy, denture adjustments and dental extractions. This problem was highlighted by Shafer [4] who found that 14.8% of 779 patients surveyed with oral cancer had been initially inappropriately managed by clinicians. Scully *et al.* [6] and Shafer [4] observed that medical practitioners mainly prescribed antimicrobial medications, in particular antifungal agents, whereas dentists adopted a more mechanical approach, adjusting dentures and extracting teeth. The present study also confirmed similar practices by each group of practitioners in the community studied.

The extent of the delay by clinicians in establishing a diagnosis of oral carcinoma therefore appeared to be closely related to the degree of suspicion and diagnostic skill of the clinician, whom the patient first consulted. Once the patients were seen in the clinics of The Royal Dental Hospital, diagnosis and referral for treatment were often accomplished within 10 days.

Pogrel [8] showed that ". . . dentists missed nearly twice as many cases of oral cancer as the asymptomatic incidental cases they spotted". In this study, 11 (22%) cases of asymptomatic oral cancers were discovered as incidental findings, whilst 17 (33%) patients with oral cancer were misdiagnosed. Cooke and Tapper-Jones [5] found that general medical practitioners

tended to delay onward referral for specialist treatment more so than their dental colleagues. The present study, however, did not show any significant difference in the extent of delay in onward referral between general medical and dental practitioners.

It has been shown in previous studies [5, 6, 8] that more oral cancer patients were referred by dental practitioners than by medical practitioners, but general medical practitioners were far more likely to see advanced tumours. Indeed, the present study was able to demonstrate such a trend, with dental practitioners referring over twice as many cases as medical practitioners. Furthermore, 75% of oral cancer patients encountered and referred on by general medical practitioners had T4 primary tumours, whereas almost 60% of the patients referred by general dental practitioners had T1 and T2 lesions. Scully *et al.* [6] mentioned that the patients referred from medical practitioners were generally older than patients referred by dental practitioners, and suggested that younger patients had a greater awareness of the role of the dental practitioner as well as the disease itself, which may partly explain the greater proportion of advanced tumours seen by general medical practitioners.

The majority of patients with incidental findings of asymptomatic oral cancer had early lesions that were detected at The Royal Dental Hospital of Melbourne. Hence, half the patients presenting directly to The Royal Dental Hospital of Melbourne had early (T1) primary tumours.

Referral letters from general medical and dental practitioners were typically very brief. Medical practitioners tended to provide a history with more general medical information while dental practitioners were likely to give a more detailed description of the tumour. The degree of urgency expressed in the referral letters in this study was difficult to compare with the study of Scully *et al.* [6], who claimed that general medical practitioners were more likely to emphasise the urgency of the referral than their dental colleagues. It was interesting to find that 16% of the referral letters mentioned the likelihood of malignancy, possibly reflecting the uncertainty of the majority of the clinicians or alternatively, that clinicians may have wanted to conceal their suspicions.

It is clear that the more advanced tumours have a worse 5 year survival rate [2, 20]. This study has shown that the greatest delay in presentation of oral cancer was caused by patients seeking advice, especially from general medical practitioners and this finding was similar to Scully *et al.* [6] in Bristol, UK. Clinicians were also identified as a source of delays in diagnosis in one-third of the patients in this study.

The findings from the present study are cause for concern and indicate that a lack of patient awareness and inappropriate clinical management prevail considering the dramatic change that delay in treatment can bring to survival rates, from almost 60% 5 years survival rate for T1 tumours to less than 20% 5 year survival rate for T4 tumours [20]. The dramatic physical and psychological effects of treatment of advanced lesions indicates a need for preventive strategy of intensive public awareness campaigns and continuing medical education programmes aimed at reducing or eliminating delays in presentation, referral and diagnosis of oral cancer. Such programmes can be expected to result in earlier detection of oral precancer and cancer with relatively simple surgical cures in many cases and considerably improved survival rates.

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