Detection of tongue cancer in primary care

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SUMMARY

Background: *The incidence of tongue cancer is increasing, and survival has not improved since the majority of patients present at an advanced stage. Patient delay has remained the same over the years and is difficult to influence. Much less is known about the delay in diagnosis caused by physicians and dentists.*

Aim: *To investigate the detection of tongue cancer in primary care in Northern Finland and to examine the consultation prevalence of oral symptoms in primary care in Finland.*

Study: *Analysis of data from medical records of tongue cancer patients kept between 1 January 1974 and 31 December 1994 for the general health insurance scheme.*

Setting: *The two northernmost provinces of Finland (population of 700 000).*

Method: *Data were collected on demographic and clinical variables and on the first medical visit on 75 tongue cancer patients. In addition, primary care physicians recorded all patient visits during four weeks in 25 health centres randomly selected throughout Finland in 1996.*

Results: *At the initial visit, the tongue cancer patient was correctly referred for further examinations in 49 (65%) cases. In 12 (16%) of cases the patient was not referred but was scheduled for a follow-up visit, and was neither referred nor followed-up in 14 (19%). When compared with the referred patients the median professional delay was somewhat longer for the unreferred patients but increased dramatically if no follow-up was arranged (0.6 months [range = 0.1–2.4] versus 1.2 [range = 0.3–2.2] versus 5.2 [range = 0.7–18.2],* P*<0.001). Compared with the referred patients the adjusted relative hazard of death for the non-referred followed-up patients was 1.4 (95% confidence interval [CI] = 0.31–6.5) and that for the non-referred/not followed-up patients 6.3 (95% CI = 1.7–22.9). The high-risk patients included those who sought an early professional evaluation, those who made the appointment for a completely different reason and only mentioned the symptom suggestive of cancer incidentally, those that had a small ulcerative lesion, and blue-collar workers. Oral symptoms were a rare cause of visits (0.55% of all visits) in primary care in Finland.*

Conclusion: *Misdiagnosis of tongue cancer at the initial professional evaluation often leads to a fatal delay if the patient is left without any follow-up.*

Keywords: *tongue cancer; detection; prognosis; survival, symptoms.*

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Introduction

TONGUE cancer incidence and mortality rates have increased both in Europe and in the United States of America in recent decades, especially in young males.[1-3] The stage of the disease at the time of diagnosis is the most important factor affecting the prognosis.[4] Unfortunately, a large proportion of these tumours are advanced at the initial presentation.[5] The overall delay in diagnosis is owing to both the patient and the medical professional. Patient delay is difficult to influence and has not become shorter over the years.[6] Knowledge of the initial medical visit and professional delay in oral cancer is rather limited and most of it has been derived from hospitals either by interviewing after the diagnosis[7-9] or from referral letters.[10-12] Nevertheless, diagnostic failures at the initial professional evaluation have been reported to occur in about 30% of the cases of oral cancer.[7,8,11]

We wanted to study more accurately the process of detecting tongue cancer patients in primary care. To examine whether the quality of symptoms and patients' and physicians' characteristics have an effect on the correct detection of cancer and how this affects the prognosis, we gathered information from primary care units about the early signs and symptoms and about the first medical visits in a population-based sample of tongue cancer patients in Northern Finland. In addition, we evaluated the consultation prevalence of oral symptoms in primary care in Finland.

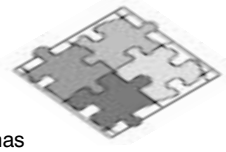
Method

Data on tongue cancer in the two northernmost provinces of Finland

The health care system in Finland is based on a general health insurance scheme and provides equal access to medical and hospital services for everyone. The Finnish law obliges all licensed physicians to keep medical records of each medical visit that must be kept for 20 years after a patient's death. In practice, all records have been kept so far. Primary care physicians record each visit on a specific sheet with the following subheadings: reason for the visit, medical history, status, diagnosis, treatment, and possible referral. All new patients who come to a tertiary care centre must have a referral letter from a physician working in primary care.

The study area comprised the two northernmost provinces of Finland with a population of approximately 700 000. The Oulu University Hospital is the only tertiary centre in the area and all patients with tongue cancer are treated and followed up there. All the patients who lived in the area and were diagnosed for tongue cancer (International Classification for Diseases, version 9, code 141) during the period from 1 January 1974 to 31 December 1994 were identified from the registers of the tertiary centre, from Statistics Finland, and from cause of death statistics, where possible death and its cause were derived.

HOW THIS FITS IN



What do we know?
Patient delay in oral cancer has remained the same for decades. Patient delay is very difficult to influence and it has not proved to have prognostic value.

What does this paper add?
Unlike patient delay, professional delay is an accurate measure and can be influenced. The diagnostic skill and activities of the primary care physician/dentist first contacted by the tongue cancer patient have a profound effect on the patient's survival.

Altogether, 108 new cases of tongue cancer were detected in the period 1974 to 1994. We excluded 10 cases referred from primary care because of a premalignant oral lesion that underwent a cancerous change during the hospital follow-up and two cases discovered incidentally at the tertiary centre, leaving 96 patients. We recorded detailed data on the first medical visit from the patient files of the primary health centres and the private medical and dental practitioners who could have been consulted by the patient for medical help. Data on demographic and clinical variables were drawn from the tertiary centre. The primary care patient files for 21 cases were missing, leaving 75 (78%) patients. The age and sex distribution or the stage of the disease of these patients did not differ from the rest of the patients (data not shown).

Patient delay was defined as the interval between the perception of the first symptoms and the initial professional evaluation, which was the first visit after the onset of symptoms regardless of the symptom the patient gave as the main reason for the visit. Professional delay was determined as the interval between the initial consultation and the final histologically verified diagnosis. Total delay was the sum of patient and professional delays.

Data on primary care consultations for oral symptoms in Finland

The consultation prevalence of oral symptoms in primary care in Finland was collected as part of a study that examined patient pain in general practice.[13] A total of 25 health centres were randomly selected throughout Finland. Four of these health centres were in urban or industrial towns, five in smaller towns, and the remaining 16 were from sparsely populated rural communities. Altogether, 28 primary care physicians took part in the four-week study, one week from each of the four seasons in 1996. All visits except out-of-hours visits were recorded. The reason for the visit and age and sex of the patient were collected. The symptoms were classified according to the International Classification of Primary Care[14] (oral symptoms were those with ICPC codes D19, D20, D82, and D83). Altogether, 5646 visits were recorded of which 4037 (71%) were primary consultations and 1609 (29%) were follow-up visits.

Statistical analysis

We present the summary statistics for the continuous variables by using the median and range. We analysed the differences in categorical data using the chi-square test. For continuous data we compared the groups using the Kruskal–Wallis tests. Disease-specific mean survival times and SEs were calculated using the Kaplan–Meier method and the survival functions were compared using the log rank test. Multivariate analyses were undertaken using the stepwise Cox regression model with survival from diagnosis as the outcome measure. In addition, to the result of the primary medical consultation ('referred' versus 'not referred but followed-up' versus 'neither referred nor followed-up') the following factors that were found earlier to be the most important prognostic factors in oral squamous cell carcinomas were included in the model: Tumour, Nodes, and Metastases (TNM)[15] stage classification,[4,16] age ('60 years or over' versus 'under 60 years'),[16] and histological malignancy grading.[17] TNM stage was dichotomised as stage I–III versus stage IV as, according to the log rank test, survival in stage IV was substantially lower than in the other stages.

Results

Tongue cancer in the two northernmost provinces of Finland

The median age of the 75 patients (34 men, 41 women) at diagnosis was 64 years (range = 26–85 years). Sixty-eight (91%) of the patients were 40 years of age or older. Sixty (80%) had low occupational status according to the United Nations classification (1978)[18] and 45 (60%) came from an urban domicile (Statistics Finland, 1993).[19] The median size of the tumour was 32 mm (range = 5–100 mm). In 50 cases (67%) the tumour was located marginally in the tongue and in 25 cases it was located on the lower or upper surface or diffusely. Forty-two (56%) patients had a localised disease. Sixty-one (81%) patients first contacted a medical practitioner and 14 a dental practitioner. The mean follow-up time was 53.3 months.

At the initial visit, the tongue cancer patient was correctly referred for further examinations in 49 (65%) cases, was not referred but was scheduled for a follow-up visit in 12 (16%) of cases, and was neither referred nor followed-up in 14 (19%) of cases (Figure 1). The overall median professional delay was 0.7 months (range = 0.1–18.2 months). Compared with the referred patients this delay was significantly longer for the non-referred patients and further increased dramatically if no follow-up was arranged ($P<0.001$). In contrast, the median patient delay was shortest in the non-referred/not followed-up patients ($P = 0.05$). The mean disease-specific survival time was significantly shorter among the non-referred patients than the referred patients and shortest among the non-referred/followed-up patients ($P = 0.001$). The difference in survival functions between these groups is shown in Figure 2.

The results of the multivariate analysis of factors influencing survival were as follows (reference category in parenthesis): primary consultation resulting in non-referral with a scheduled follow-up (referral), hazard ratio (HR) = 1.4, 95% confidence interval (CI) = 0.31–6.5; primary consultation resulting in non-referral with no scheduled follow-up (referral), HR = 6.3, 95% CI = 1.7–22.9; stage IV (stage I-III), HR = 3.0, 95% CI = 0.92–9.7; age 60 years or over (less than

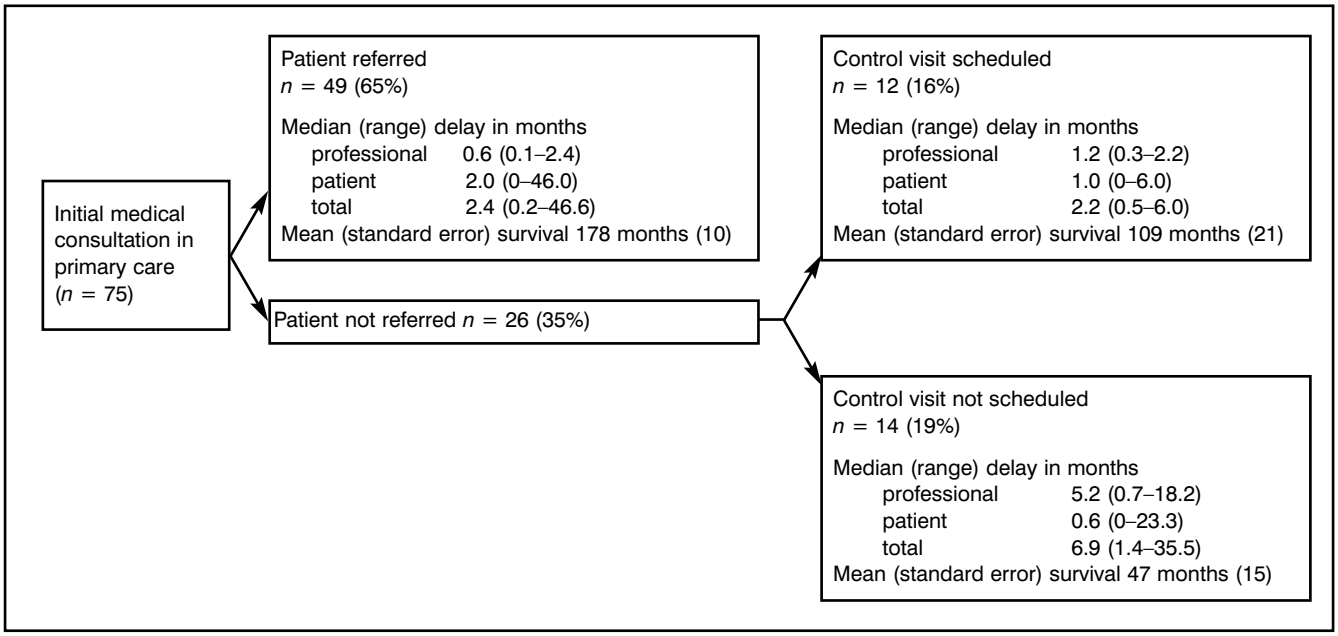


Figure 1. Detection of tongue cancer patients in primary care in Northern Finland in 1974–1994 (mean survival times are disease-specific)

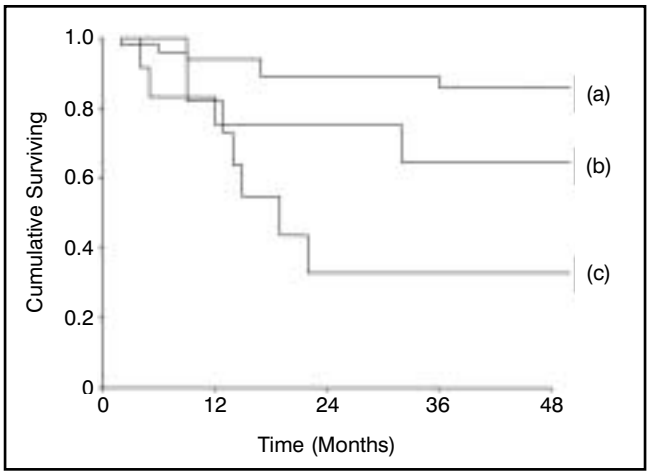


Figure 2. Influence of the decisions made on the initial professional consultation on survival in 75 tongue cancer patients: (a) patient referred onwards; (b) patient not referred, but a follow-up visit scheduled; (c) patient not referred and no follow-up scheduled.

60 years), HR = 1.4, 95% CI = 0.47–4.3; histological grading, HR = 0.98, 95%CI = 0.74–1.3.

Forty-eight (64%) of the patients named a specific sign or pain in the tongue as the primary reason for the initial visit and 37 (77%) of these patients were referred (Table 1). In contrast, only 10 (40%) of the 25 patients whose main complaint was either an unspecified tumour symptom or a totally unrelated symptom were referred. All the patients had mentioned an oral symptom during the visit. The median duration of the main symptom was 1.0 month (range = 0–46.0 months) and it was not related to any patient characteristics or to the TNM stage at diagnosis, or to survival (data not shown).

The tumours that remained undiagnosed at the initial visit tended to be larger at the time of the diagnosis, located on the lower or upper surface, ulcerative, histologically more aggressive and more advanced than the recognised tumours (Table 2). Inspection of the mouth was done in every case but palpation of the tongue was performed in only 14 (19%) cases and biopsy of the lesion in 11 (15%) cases (Table 3). The palpated lesions were referred more often. Four of the biopsies were too superficial and failed to give the right diagnosis. In 35 (72%) of the referred patients, a correct suspicion of cancer was made. The non-referred patients were most often suspected of having either a benign lesion or an infection. There were no statistically significant differences in the ability to refer cancer patients correctly between physicians and dentists. Low occupational status, rural domicile, and the patient being unable to live independently at home were all qualities that were related to non-referral (Table 4). Among the non-referred patients urban domicile was associated with no planned follow-up.

Primary care consultations for oral symptoms in Finland

There were a total of 31 visits (0.55% of all visits) made for oral symptoms. Twenty-nine visits (93%) were primary consultations and two were follow-up visits. The visits were made for the following reasons: symptom/disease of mouth, tongue or lips (24 visits) and symptom/disease of teeth or gums (seven visits). Nineteen of the patients (61%) were women and the mean age was 45 years (range = 1–80 years). Twenty-one visitors (68%) were older than 40 years.

Discussion

Our results show that the diagnostic skill and activities of the professional first contacted by the tongue cancer patient in primary care have a profound effect on the patient's survival. Patients who are suspected of having cancer at the initial visit and are hence referred naturally have the best prognosis; however, the delay is usually not fatally long in the undetected cases for whom a follow-up visit is scheduled within a

Table 1. Primary reason for the initial professional consultation by 75 tongue cancer patients stratified according to whether the patient was referred or not. (P = 0.02[b])

Primary reason for consultation	Referred (%) (*n* = 47)[a]	Not referred but followed up (%) (*n* = 12)	Neither referred nor followed up (%) (*n* = 14)	*P*-value[b]
Specific sign or pain in tongue	37 (77)	4 (33)	7 (50)	0.02
Unspecific tumour symptom[c]	4 (8)	2 (17)	3 (21)	
Other reason[d]	6 (12)	6 (50)	4 (29)	

[a]The primary reason was unknown in the case of two referred patients. [b]Calculated using a chi-square test that compares the groups collectively. [c]The unspecific tumour symptoms in an order of frequency were: chafing tooth or denture, swollen tongue, altered speech, a neck node. [d]The other reasons in an order of frequency were: fatigue or general weakness, common cold, routine dental examination, blood pressure control, chest pain, installation of hearing aid, hemoptysis, menopausal problems, rehabilitation control, stomach ache, tension neck.

Table 2. Tumour characteristics of 75 tongue cancer patients according to whether the patient was referred at the initial professional consultation[a] .

Tumour characteristic	Referred (*n* = 49)	Not referred but followed up (*n* = 12)	Neither referred nor followed-up (*n* = 14)	*P*-value[b]
Median tumour size (mm) (range)	30 (5–100)	40 (15–100)	40 (15–60)	0.11
Tumour location				0.07
Marginal (%)	34 (69)	10 (83)	6 (43)	
Lower/upper surface/diffuse (%)	15 (31)	2 (17)	8 (57)	
Tumour appearance[c]				0.02
Exophytic (%)	25 (51)	3 (25)	2 (14)	
Ulcerative (%)	23 (47)	8 (67)	12 (86)	
Neck nodes (%)	18 (37)	8 (67)	7 (50)	0.15
TNM stage classification				0.04
I (%)	8 (16)	0	1 (7)	
II (%)	17 (35)	2 (16)	3 (21)	
III (%)	21 (43)	5 (42)	7 (50)	
IV (%)	3 (6)	5 (42)	3 (21)	
Median (range) malignancy grade[14]	10 (7–16)	12 (9–14)	12 (9–16)	0.02

[a]Data were collected at the time of the final diagnosis. [b]Calculated using a chi-square test that compares the groups collectively. [c]Data available for 67 patients.

reasonable timeframe. In contrast, the undiagnosed patients who are left without any follow-up have a significantly longer delay resulting in a poorer survival even after the other known prognostic factors are adjusted for. This is unfortunate as these patients seem to be seeking professional help early; an incorrect diagnosis probably gives them a false sense of security that causes them to postpone the second consultation. In this series, 19% of the patients were left without any follow-up resulting in a median professional delay of 5.2 months and an adjusted relative hazard of death of 6.3 (95% CI = 1.7–22.9). The effect of the misdiagnosis at the initial presentation on survival was even greater than that of the TNM stage.

From a GP's point of view, tongue cancer is a rare disease. In the two northernmost provinces of Finland four new cases of tongue cancer emerged per year on average during this study. According to the Finnish Medical Association, the numbers of physicians and overall visits in 1996 in this area were 520 and 1 502 800, respectively. These figures give a detection rate of tongue cancer of 4/1 502 800; i.e., one per 375 700 visits. Assuming that the consultation prevalence of oral symptom is 0.55% as was found, the detection rate is increased to approximately one per 2000 in patients with oral symptoms and to one per 1400 in patients older than 40 years with oral symptoms. These figures mean that, on average, a GP would see a case of tongue cancer about once in every 130 years. Considering the rarity of the tongue cancer the misdiagnosis rate that we calculated is relatively good. However, it is important that GPs and dentists know that misdiagnosis at first presentation to primary care results in a substantial reduction in survival. As not all of the GPs will even see a tongue cancer during their career, repeated education is needed to give a reminder of these rare cancers.

We found several factors that affected the referral rate. The more closely the primary symptom given by the patient as the main reason for the visit was related to the tongue, the more often the patient was referred. It is noteworthy that as many as 21% of the patients made the initial appointment for a completely different reason and only incidentally mentioned the oral symptom, resulting in only 37% of these patients being referred. In the recent study by Allison *et al*[9] it was found that co-morbidity present at the initial visit to the health care professional increases the professional delay. Awareness of the possibility of having a malignant lesion and a tendency to observe one's symptoms more closely, ignorance, indifference to one's health, and finally, denial of cancer are some of the reasons for the different presentation of the patients.[6,20]

The referred patients tended to have exophytic tumours located on the marginal edge of the tongue, which are more readily visible. The non-referred patients tended to have larger and histologically more aggressive tumours and more

Table 3. Characteristics of the first medical visit by 75 tongue cancer patients according to whether the patient was referred at the initial professional consultation.

Characteristic	Referred (%) (*n* = 49)	Not referred but followed up (%) (*n* = 12)	Neither referred nor followed up (%) (*n* = 14)	*P*-value[a]
Examination				
Inspection of mouth	49 (100)	12 (100)	14 (100)	-
Palpation of tongue	13 (27)	1 (9)	0	0.04
Biopsy of tumour	7 (14)	3 (25)	1 (7)	0.43
Suspected diagnosis				
Malignant lesion	35 (72)	1 (8)	0	
Premalignant lesion	2 (4)	1 (8)	0	
Benign lesion	6 (12)	3 (25)	5 (36)	
Infection (bacteria, fungi)	1 (2)	6 (50)	7 (50)	
Not named	5 (10)	1 (8)	2 (14)	
Medical professional				0.13
Physician	39 (80)	9 (75)	13 (93)	
Dentist	10 (20)	3 (25)	1 (7)	
Primary care unit				0.60
Health centre	37 (76)	11 (92)	12 (86)	
Private professional	12 (24)	1 (8)	2 (14)	

[a]Calculated using a chi-square test that compares the groups collectively.

Table 4. Patient characteristics of 75 tongue cancer patients according to whether the patient was referred at the initial professional consultation.

	Referred (*n* = 49)	Not referred but followed up (*n* = 12)	Neither referred nor followed up (*n* = 14)	*P*-value[a]
Median (range) age (years)	64 (26–85)	61 (32–85)	67 (47–84)	0.78
Female (%)	25 (51)	5 (42)	11 (79)	0.12
Low occupational status (%)	34 (69)	12 (100)	14 (100)	0.009
Urban domicile (%)	32 (65)	2 (17)	11 (79)	0.003
Living at home independently (%)	47 (96)	10 (83)	14 (100)	0.02
Smoking[b] (%)	25 (51)	9 (75)	7 (50)	0.09

[a]Calculated using a chi-square test that compares the groups collectively. [b]Data available for 65 patients.

advanced disease than the referred patients at the time of the diagnosis. Although the exact values of these parameters at the time of the initial visit can only be concluded we presume that because of the relatively long professional delay the non-referred/not followed-up cases probably had smaller tumours and more localised disease than the referred ones, regardless of the fact that the tumour growth rate is not constant.[7] This is in agreement with the studies of Wildt *et al*,[8] Allison *et al*,[9] and Dimitroulis *et al*[11] where larger and more visible lesions were diagnosed earlier than smaller lesions.

Mouth inspection was recorded as having been done on every patient and 67 (89%) patients were given a diagnosis indicating that a pathological change of some kind was seen in the mouth. The lesions suspected to be cancer tended to be palpated more often than the unsuspected ones. Only 11 of the tumours (15%) were biopsied at the initial visit but, alarmingly, one-third of these biopsies were too superficial and failed to give the right diagnosis. Thus we feel that clinical suspicion should outweigh the biopsy result in case the histology does not support the clinical diagnosis. We did not find any statistically significant differences in correct referrals between physicians and dentists. Although our sample was small with limited statistical power this result confirms the findings of Scully *et al*.[10] It is particularly distressing to find that patients' characteristics, such as low occupational status and inability to live alone at home, were related to unreferral. These qualities together with the patient's main complaint may affect whether cancer enters the physician's or dentist's mind. If the possibility of cancer is not recognised then the examination although performed and recorded, may remain superficial and the cancer may go undetected.

We aimed at collecting data on all tongue cancer cases in the two northernmost provinces of Finland during the years 1974 to 1994. Data were drawn from the Oulu University Hospital which is the only tertiary care centre in the area where all the cases are treated and also followed up. The cases were checked against the cause of death statistics from Statistics Finland and we believe that virtually all of the cases in the area were included. Information on the initial visit was not available for all patients, giving rise to the possibility of small selection bias. However, the missing cases did not differ from the rest of the sample with regard to age, sex, and TNM stage. Since ours was a retrospective sample we had no control over the nature and quality of the records from which the variables were gathered. Nevertheless, the primary care records were detailed and enabled us to obtain accurate information about the early signs and items at the initial visit. Furthermore, these records were made before the patients knew that they had cancer and thus were not biased by this knowledge. A clear drawback was that only the cancer cases were recorded, leaving a gap in our knowledge of overdiagnoses. However, our experience is that the

false-positive referral rate is not very high. According to the present data, physicians were circumspect in giving a diagnosis of cancer even for those patients who they immediately referred to tertiary care. The patients were drawn from a relatively small geographical area and the sample size was small; these are factors that may detract from the precision and generalisability of this study. However, in other respects than the higher proportion of women, the present series resembles those reported elsewhere.[8,12,21]

Tongue cancer is a rare disease, which not all GPs will even see during their career. However, we have shown that the misdiagnosis of tongue cancer at the initial professional evaluation often leads to a fatal delay if the patient is left without any follow-up. All physicians who manage patients with oral lesions should keep in mind the possibility of a malignant disease and follow up the patient, particularly if there is any doubt as to the diagnosis. All the symptoms should be taken seriously, even those that are not the patient's main complaint but are only mentioned incidentally. The high-risk patients include those who seek professional evaluation early, those who make an appointment for a completely different reason and only mention the symptom suggestive of cancer incidentally, those having a small ulcerative lesion, and blue-collar workers.

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