

# Delays in Diagnosis of Head and Neck Cancers

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## ABSTRACT

**Background:** Delayed diagnosis of head and neck cancer is often caused by patient-related factors. However, the primary health care provider may also be responsible.

**Objectives:** To define patient, professional and total delay, and to identify factors that may increase delay.

**Methods:** The study group consisted of 102 patients with oral or pharyngeal cancer referred to Princess Margaret Hospital, Toronto, Ontario. The study took place from September 2005 to September 2006.

**Results:** Median patient, professional and total delays were 4.5 weeks, 11.8 weeks and 22.5 weeks, respectively. Significantly longer delays were found among women ( $p < 0.01$ ), non-smokers ( $p < 0.01$ ), patients who were not referred following initial consultation ( $p < 0.001$ ) and patients who did not visit their dentist ( $p < 0.05$ ).

**Conclusions:** Clinicians should adopt a "universal index of suspicion" in screening for head and neck cancer, with attention to the risk indicators for delay. Patients must also be encouraged to visit their dentist regularly to increase the rate of early detection.

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Head and neck cancer is the term used to describe a variety of malignant tumours (primary and metastatic) that develop in the oral cavity, pharynx, paranasal sinus, nasal cavity, larynx and salivary glands (parotid, submandibular, sublingual and minor salivary glands). In 2007, approximately 159,900 new cases of cancer were reported in Canada, 8,750 (5.0%) of which were in the head and neck region. Of the 72,700 deaths due to cancer, 1,780 (2.4%) were related to cancers of the head and neck.<sup>1</sup> In fact, oral cancer has one of the lowest 5-year survival rates ( $\leq 50\%$ ) among the major types of cancer, including breast, skin, testes, prostate, uterus and urinary bladder cancers.<sup>2</sup>

In 2004, the Royal College of Dental Surgeons of Ontario reported 2 findings of professional misconduct pertaining to misdiagnosis of cancer in the head and neck

region.<sup>3,4</sup> In the first case,<sup>3</sup> the dentist failed to investigate, monitor or diagnose an oral lesion in an adolescent patient over a period of 13 months, although he had a number of opportunities to do so. The lesion was eventually diagnosed by a specialist as an odontogenic carcinoma, and the patient underwent a partial maxillectomy. In the second case,<sup>4</sup> the dentist failed to obtain an adequate medical history for an acutely ill patient and did not record the onset and periodicity of numbness, swelling of the tonsils, nausea, malaise and pain. The patient, a young woman, was ultimately diagnosed with acute lymphoblastic leukemia of the Burkitt's cell type, which required urgent assessment and treatment.

Abnormalities caused by head and neck cancers are often overlooked because they are not always specifically indicative of cancer.

In addition, when patients are considered at low risk for cancer (e.g., non-smokers), both the patient's and the clinician's index of suspicion for malignancy is low. Signs and symptoms vary depending on the location and type of malignancy.<sup>5</sup> Neville and others<sup>6</sup> recommend 8 steps in a proper examination for oral cancer and the use of adequate lighting, protective gloves, 2 × 2 gauze squares and a mouth mirror or tongue blade.

When a malignant tumour is discovered, prognosis depends heavily on early diagnosis and treatment.<sup>7-12</sup> However, previous studies in several populations have shown that there is often a substantial delay in the diagnosis of oral cancer.<sup>13-15</sup> Although the role of the dentist is crucial, diagnosis of early carcinoma in the head and neck region can be problematic even for the most skilled and experienced dental clinician.<sup>16</sup>

Delays in diagnosis include 2 periods.<sup>13,15,17,18</sup> The time from the onset of symptoms to the initial visit to a dental or medical professional is known as "patient delay." "Professional delay" is the time during which the patient is under professional care until a final diagnosis is made, i.e., the tumour is confirmed histologically to be malignant.<sup>19</sup> The "total delay" is the sum of patient and professional delay.<sup>18</sup> The objectives of this study were to estimate patient, professional and total delay and identify factors that might influence the length of the delay.

## Materials and Methods

Factors associated with diagnostic delay among head and neck cancer patients presenting to Princess Margaret Hospital, Toronto, Ontario, were evaluated from September 2005 to September 2006. Informed consent was obtained from all patients who participated in the study. The protocol was reviewed and approved by the Research Ethics Board of the University Health Network (Toronto, Ontario).

Patient characteristics (i.e., age, gender, employment status) were recorded in hospital by a single interviewer. Patients were asked to report the first signs or symptoms noticed (if any) in an open-ended question. The initial action (e.g., antibiotic treatment, referral) was the decision made by the clinician who treated the patient initially following this first contact. Patients were also asked if they had had routine dental checkups at least once a year. Risk marker data included demographic and socioeconomic characteristics, as well as information on tobacco and alcohol use. Dates of biopsies and confirmed histopathologic diagnoses were recorded and confirmed using the medical chart, dental chart and referral notes.

### Patient, Professional and Total Delay

Patient delay was defined as the duration from onset of signs or symptoms to the initial visit to a dental or medical professional. Professional delay was defined as the time from this first visit with a health care profes-

sional to the date of confirmed diagnosis. Total delay was the sum of patient and professional delay.

Median values were calculated for patient, professional and total delay, and bivariate analysis was used to determine whether there were significant relations between length of delay and risk markers. Patients with time periods above the median value were considered "delay groups," while those with values below the median were classified as "non-delay" groups. All variables were analyzed to determine whether they had any significant (or non-significant) relation to patient, professional and total delay.

## Results

In all, 105 patients were interviewed; 3 were excluded from the study because of missing information or lack of consent. Ages ranged from 31 to 93 years, with a mean of 62.2 ± 12.7 years and a median of 60 years. There were 63 males and 39 females. Most patients were employed (46.1%) or retired (32.4%); only 21.6% were unemployed (21.6%).

The most common initial symptom reported was swelling (32.4%), followed by pain (18.6%) and dysphagia (14.7%). When seeking initial consultation, most patients (78.4%) saw their family physician rather than their dentist (14.7%). Following consultation, most practitioners initially referred patients to a specialist (38.2%). Some practitioners recommended antibiotic therapy (17.6%), whereas others did not feel that any further investigation or treatment was necessary (12.7%).

Approximately two-thirds of patients saw their dentists for regular checkups. Most patients smoked or had a history of smoking; median values reported were 20 cigarettes a day for 35 years. Approximately half of the patients reported a history of alcohol intake, whether they were currently drinking or had quit (52% cumulatively); the median value reported was 2 drinks a day.

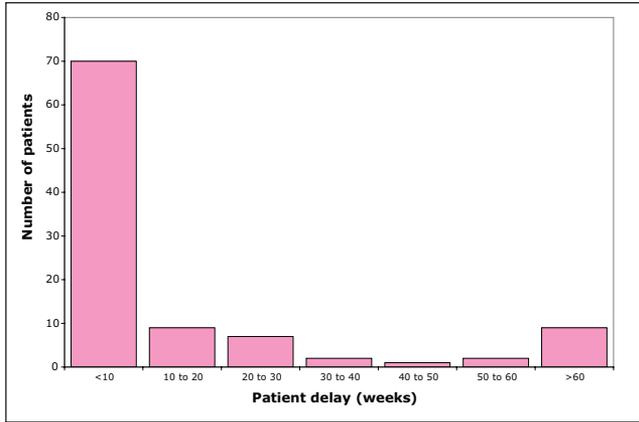
Overall, 29 different sites of head and neck cancer were reported. The most common was the tongue (16.7%), followed by the tonsils (12.7%) and larynx (10.8%). At the time of diagnosis, most patients' cancer was at stage IVA (36.3%), followed by stage III (12.7%).

Mean patient delay was 21.7 ± 51.7 weeks; the median was 4.5 weeks (**Fig. 1**). The mean professional delay was 21.4 ± 27.5 weeks; the median was 11.8 weeks (**Fig. 2**). Total delay averaged 43.1 ± 61.9 weeks, with a median of 22.5 weeks (**Fig. 3**).

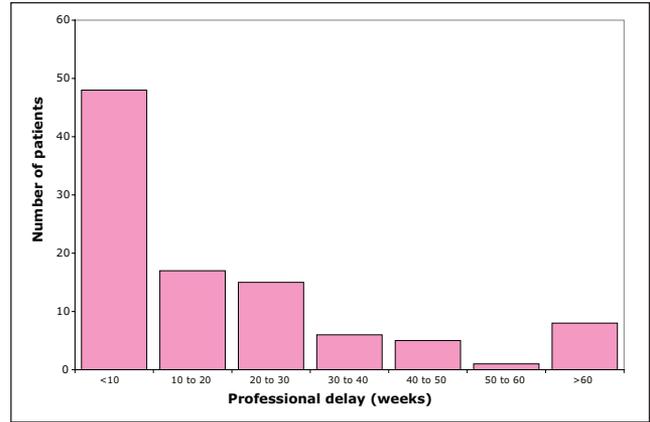
### Risk Indicators

Gender was a significant factor in diagnostic delay, i.e., total delay for women was significantly greater than for men ( $p < 0.01$ ).

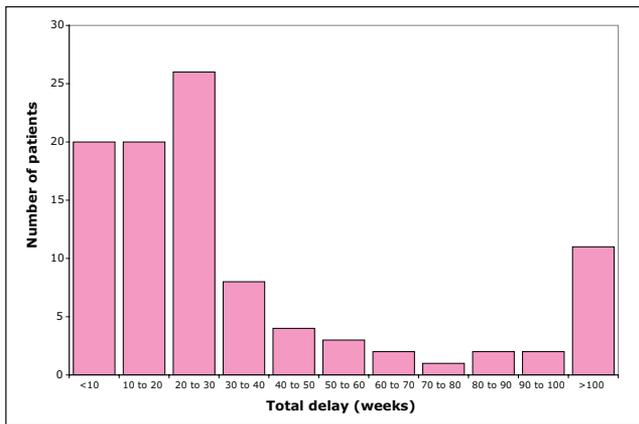
Initial treatment was also a significant factor in both professional and total delays ( $p < 0.001$  and  $p < 0.01$ , respectively). When practitioners decided to refer im-



**Figure 1:** Patient delay (mean 21.7 ± 51.7 weeks, median 4.5 weeks, range 0.5–352 weeks). No data available for 2 patients.



**Figure 2:** Professional delay (mean 21.4 ± 27.5 weeks, median 11.8 weeks, range 1–156 weeks). No data available for 2 patients.



**Figure 3:** Total delay (mean 43.1 ± 61.9 weeks, median 22.5 weeks, range 2.5–364 weeks). No data available for 3 patients.

mediately, delays in diagnosis were dramatically reduced compared with cases where no treatment of follow-up was recommended.

Annual dental checkups were significantly related to both patient and professional delays ( $p < 0.05$  and  $p < 0.01$ , respectively). If patients were not under the regular supervision and care of a dentist, they were more likely to have longer diagnostic delays.

Finally, patients who were non-smokers tended to have longer professional and total delays ( $p < 0.05$  and  $p < 0.01$ , respectively) compared with smokers.

## Discussion

Despite strides in recent decades to improve the prognosis for a number of cancers, similar improvements have not been seen in oral cancer. Early diagnosis depends on an astute clinician or a patient who may identify a suspicious lesion or symptom while it is still at an early stage. It is apparent that many clinicians, including dentists and physicians, may not be fully aware of the risk factors, diagnosis and early detection of these cancers or are not

performing routine oral cancer examinations.<sup>6</sup> This is especially important in the dental setting, where patients may be seen routinely for oral health checkups as part of regular dental scaling and prophylaxis.

Early head and neck cancers often cause only subtle changes or are asymptomatic. However, our finding of a median total delay of nearly 6 months was much longer than expected. Therefore, it is important for clinicians to maintain a high index of suspicion, regardless of risk factors such as tobacco or alcohol use. Clinicians must also recognize identifiable premalignant changes in the oral mucosa, as well as other signs such as the presence of a non-healing ulcer. Later-stage symptoms include bleeding, loosening of teeth, difficulty wearing dentures, dysphagia, dysarthria, odynophagia and development of a neck mass.<sup>6</sup> Physicians and dentists must refer such cases to oral cancer or head and neck oncology specialists to minimize diagnostic delay. Our finding that 12.7% of clinicians suggested that no treatment or follow-up was necessary was higher than expected. In contrast, significantly fewer patients who had been appropriately referred were in the delay group ( $p < 0.001$ ). Ultimately, if there are signs of potential malignancy, health care professionals must promptly make an appropriate referral for diagnosis.

Many factors influence patient delay, but education of the public will improve this situation. Patients who did not visit their dentist on a regular basis were more likely to have longer delay periods ( $p < 0.05$ ). To increase oral cancer survival, public education efforts must also continue to encourage patients to avoid high-risk behaviours, as well as to ask their health care providers about regular oral cancer screening examinations. Based on the results of this study, there was no significant difference between patients initially seeing their dentist and those seeing their family physician.

What length of delay is considered detrimental remains debatable. The effect of a delay in diagnosis on the

ultimate outcome of the patient is uncertain.<sup>20</sup> However, certain risk factors must not be overlooked, as they tend to be associated with longer delay periods. In the current study, patient delay periods were longer for female patients. The reasons for this may vary. Among 13,538 people interviewed in the United States Epidemiologic Catchment Area Program, gender had a major effect on symptom prevalence, in that women reported more symptoms than men.<sup>21</sup> This finding may be explained by their heightened selective attention to body-related signals, which amplifies the perception of interoceptive signals,<sup>22</sup> or their recollection of initial symptoms may have been more accurate than their male counterparts, leading to a longer (but more accurate) reported period of patient delay. Further investigation is necessary to determine why women had greater delays.

Practitioners must not overlook the risk of head and neck cancer in non-smokers, as this group also tended to have longer periods of professional and total delays ( $p < 0.05$  and  $p < 0.01$ , respectively). Clinicians may not be as attentive in examining such patients for oral cancer as they have a low index of suspicion for cancers occurring in non-smokers. It is important to treat every patient with a universal index of suspicion, regardless of tobacco or alcohol use.

Continuing education in head and neck cancer is important to reduce professional delay. When evaluating for oral cavity cancer, Lydiatt suggests the following guidelines: heeding a patient's statement that something is different; obtaining a firm diagnosis for any abnormality; considering cancer in all patients with symptoms, regardless of their age; ensuring a patient with a neck mass is followed to resolution or diagnosis; obtaining a definitive diagnosis within 3 months; realizing that repeated examinations may be needed to arrive at a diagnosis; further investigating fine-needle aspiration, tissue biopsy or radiographic examinations if they are inconsistent with the clinical examination; performing a biopsy of any suspect lesion; taking a complete history; maintaining close communication with the patient's other health care providers.<sup>20</sup> He also recommends that primary care physicians and dentist screen for oral cancer.<sup>20</sup> There continue to be cases of professional misconduct pertaining to misdiagnosis of cancer in the head and neck region. Although, as yet, there is no unambiguous, hence legally acceptable, definition of "diagnostic delay," it should be clear that any delay in diagnosis ought to be avoided when possible. ♦

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