A review of the oral cancer referral pathway system in Dublin Dental University Hospital

Précis

The 'open door' policy adopted by the Dublin Dental University Hospital appears to be efficient in reducing delay in the clinical pathway to treatment for oral cancer.

Abstract

Introduction: The incidence of oral and oropharyngeal cancer in Ireland is increasing, with approximately 503 cases diagnosed annually. A delay in diagnosis for oral cancer leads to advancement in tumour staging, which increases the risk of mortality up to two-fold. Early detection contributes to the reduction of morbidity and improvement of survival rates.

Aim: This review aims to assess the sources of referral and evaluate the efficiency of DDUH's oral cancer referral pathway system.

Methods: A retrospective search was carried out through the hospital's electronic dental records (EDRs) of patients from January 1 to December 31, 2019. Patients who received a histological diagnosis of oral cancer from biopsies carried out were identified and their EDR accessed.

Results: In 2019, there were 65 confirmed diagnoses of oral cancer in the Dublin Dental University Hospital (DDUH), of which the majority (89%) were assessed within two weeks. A large proportion (89%) received the diagnosis within a month of the referral date. The primary cause of delay in the clinical pathway is the delay in patients presenting to primary care. Only 50% of patients with symptoms synonymous with oral cancer presented to primary care within four weeks.

Conclusion: The 'open door' policy adopted by the DDUH is beneficial in terms of direct access and reducing waiting time, and allows for early detection of oral cancer, which helps to reduce morbidities and improve the overall survival rates in oral cancer cases.

Key words: Oral cancer, patient delay, referral pathway, Dublin Dental University Hospital

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Introduction

In global reports, oral cavity and oropharyngeal cancers are grouped collectively and represent the sixth most common cancer in the world.[1] With approximately 503 cases diagnosed annually in Ireland, its incidence is reportedly on the rise.[2] The five-year survival rate for all patients is approximately 51%, although dependent on the stage of cancer.[2] Oral cancer cases are most commonly oral squamous cell carcinoma (OSCC). The major risk factors include tobacco and alcohol consumption, in which the synergistic effects have been well documented.[3] Heavy consumption of both products increases the risk of oral cancer 16-fold as compared to those who abstain.[4] Aetiological factors also include betel use, immunosuppression, infective agents such as Candida, viruses and, in cases of lip carcinoma, exposure to sunlight.[3] Oral cancer can also be associated with the transformation of premalignant lesions including leukoplakias, erythroplakias, submucous fibrosis and oral lichen planus.[5] Furthermore, it is increasingly documented that human papillomavirus (HPV) is a risk factor for oropharyngeal cancer.[6] Oral malignant neoplasms also include

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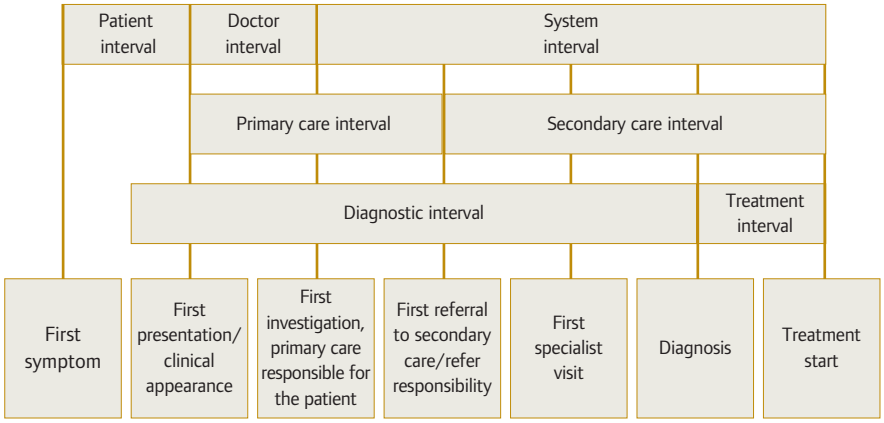

FIGURE 1: Milestones and intervals from first symptoms until start of treatment.[12]

FIGURE 2: Highly suspicious ulceration on right lateral border of the tongue.

melanomas, salivary gland tumours, lymphomas, Kaposi's sarcoma, odontogenic tumours, and metastatic neoplasms (from breast, lung, kidney, stomach, liver and prostate).[3] Poor prognosis for oral cancer is mostly due to late presentation of the disease. It is accepted in the literature that a delay in diagnosis for oral cancer leads to advancement in tumour staging, which increases the risk of mortality up to two-fold.[7] Furthermore, advanced diseases require more radical surgeries, which result in increased levels of morbidity.[8] Hence, the early detection of oral cancer contributes to the reduction of morbidity and improvement of survival rates for such cases.[9]

The research in pathways to cancer diagnosis is complex and non-homogenous due to the different methodological approaches and definitions of time intervals.[10] As such, an international Consensus Working Group (CWG) commissioned by Cancer Research UK and the Department of Health in England has introduced the Aarhus checklist, a guideline intended to facilitate the standardisation and uniformity of studies in cancer diagnosis.[11] This guideline included recommendations for definitions of the time points and intervals used in the study. In addition, a Danish study introduced categories for delays in the clinical pathway, which include patient delay, general practitioner (GP) delay and system delay (**Figure 1**).[12] Patient delay is defined as the point from first symptom to the first contact with the primary care practitioner. GP delay is defined as the time interval between first contact with the patient and investigations and/or referral to a specialist/hospital. System delay is defined as the time interval between first investigations and the start of treatment. These definitions provide a more consistent framework for assessing the referral pathway system in the Dublin Dental University hospital (DDUH).

The DDUH is a teaching dental hospital located in Dublin, Ireland, which includes a multidisciplinary team providing secondary care for oral cancer patients. It adopts an 'open door' policy whereby suspected oral cancer patients could be assessed through various referral pathways and works closely with the National Maxillofacial Unit at St James's Hospital, which provides tertiary care for oral cancer patients. Such pathways include referrals from general medical practitioners (GMPs) and general dental practitioners (GDPs), as well as self-referrals into the accident and emergency (A&E) department. Thus, with the importance of early detection of oral cancer, the aim of this review is to assess the sources of referral and to evaluate the efficiency of the DDUH's oral cancer referral pathway system.

Methods

A retrospective search was carried out through the hospital's electronic dental records (EDRs) of patients from January 1 to December 31, 2019. Patients who received a diagnosis of oral or oropharyngeal cancer from biopsies carried out were identified and their EDR accessed. The patients' age, gender, and details of alcohol and tobacco use were recorded. The dates of the patients' onset of symptoms, first appointment with a GP, referral to the DDUH, first assessment at the DDUH, biopsy and definitive diagnosis delivered to patients were also recorded. From these records, time intervals between onset of symptoms and first appointment with GP, first appointment to referral, referral to assessment at the DDUH, assessment to biopsy, and biopsy to the definitive diagnosis were tabulated and recorded.

Results

From January 1 to December 31, 2019, there were 65 confirmed diagnoses of oral cancer in the DDUH. These cases presented via various referral pathways including the A&E department, oral and maxillofacial surgery (OMFS) and oral medicine clinics, and patients periodically reviewed in the DDUH for premalignant conditions. Sources of referral included GDPs, GMPs and self-referrals. Patients with suspicious clinic presentation of oral cancer were offered immediate biopsy within the same appointment (**Figure 2**). At the follow-up appointment, the patients were informed of the definitive diagnosis and were urgently referred to the Maxillofacial Unit at St James's Hospital for treatment within the same day.

Of the 65 patients, there were 25 females (38%) and 40 males (62%) (**Figure 3**). The mean age was 65 years for both females (range 11 to 86) and males (range 25 to 87). Thirty-two patients (49%) were current or ex-smokers, which included seven of the 25 females (28%) and 25 of the 40 males (63%) (**Figure 3**). Of the 65 confirmed diagnoses, 61 (94%) were of OSCC, three were cases (5%) of lymphoma and one (1%) was a case of polymorphous adenocarcinoma. In terms of the referral pathway, six patients (9%) self-referred to the A&E department, seven (11%) presented to A&E with GMP referral, 32 (49%)

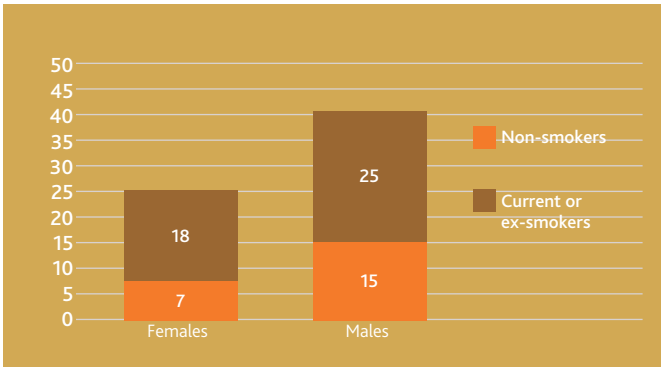

FIGURE 3: Demographics of gender and distribution of smokers.

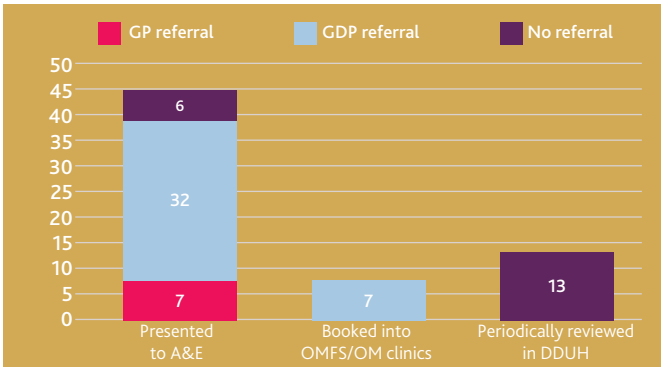

Figure 4: Distribution of patients through the referral pathways and sources of referrals.

presented to A&E with GDP referral, seven (11%) were booked into OMFS or oral medicine clinics with GDP referral, and the remaining 13 (20%) were patients periodically reviewed in the DDUH. Of the 46 patients who were referred to the hospital by a GP, seven (15%) were referred by their GMP and the remaining 39 (85%) by their GDP (**Figure 4**).

Among the 52 patients who sought treatment after first noticing signs and symptoms, 13 (25%) sought treatment within two weeks, 13 (25%) sought treatment within two to four weeks, and 26 (50%) sought treatment after more than four weeks. The signs and symptoms recorded from patients included: non-healing ulcers; white or red patches; lumps; pain; dysphagia; persistent cough; or, sore throat. Forty-eight patients first visited a GP regarding their symptoms. Two patients (4%) were prescribed antibiotics by their GMP and were not referred to the DDUH. These two patients were among the six patients who self-referred to the A&E department. Thirty-eight patients (79%) were referred within three weeks of the first appointment. Of these, 34 were referred on the same day. Eight patients (17%) were referred after three weeks. Furthermore, 41 patients (89%) attended within two weeks while the remaining five (11%) attended only after two weeks or longer. The five patients (11%) who were assessed after two weeks were due to longer waiting time for appointments with OMFS and oral medicine clinics, or only visited the A&E department after two weeks.

With respect to timing of biopsy procedure, 63 of the 65 patients (97%) had a biopsy procedure within a week. Fifty-two (80%) were carried out on the same day. Thirty-nine patients (60%) received a diagnosis within a week of the biopsy procedure, 14 (22%) within one to two weeks, and 12 (18%) within two to four weeks. Furthermore, of the 46 patients referred to the DDUH, five (11%) received a diagnosis more than a month after referral, while the remaining 41 (89%) received a diagnosis within a month (**Table 1**).

Discussion

The ratio of males to females in our sample of 65 patients is 1.6 to 1, which is similar to the global epidemiological ratio of 1.5 to 1.[1] The higher frequency of risk habits participation in males could be a contributing factor to this difference, as seen in our results whereby there were more male smokers or ex-smokers (63%) compared to females (28%). In addition, the mean age of 65 years is similar to previous studies and is a reflection of the increased risk of developing oral cancer with age.[1,13]

The National Institute for Health and Care Excellence (NICE) in the UK updated its cancer guidelines in 2015 to include recognition and referral guidance for suspected oral cancer cases. This includes a recommendation for GMPs to refer patients to a GDP within two weeks if they have an unexplained persistent mouth ulcer for three weeks, unexplained persistent neck lump, a lump on the lip or in the oral cavity, or for signs consistent with erythroplakia or erythroleukoplakia.[14] One systematic review reported that nearly 50% of symptomatic oral cancer patients presented to GMPs, suggesting the crucial role of GMPs in the diagnosis of the disease.[15] Similarly, the Health Service Executive (HSE) in Ireland updated its guidelines in 2015 regarding the early

Table 1: Distribution of patients for various timelines from first signs and symptoms to definitive diagnosis.

Patients who sought treatment after first noticing signs and symptoms	**N**	**%**
Within two weeks	13	25
Within two to four weeks	13	25
After four weeks	26	50
Patients referred after first presenting to GP		
Within three weeks	38	79
After three weeks	8	17
No referrals made	2	4
Patients who visited the DDUH after referral from GP		
Within two weeks	41	89
After two weeks	5	11
Patients receiving biopsy procedure after assessment in the DDUH		
Same day	52	80
Within a week	63	97
After a week	2	3
Patients receiving definitive diagnosis after biopsy procedure		
Within a week	39	60
Within one to two weeks	14	22
Within one to four weeks	12	18
Patients receiving definitive diagnosis since referral from GP		
Within a month	41	89
After a month	5	11

detection and referral for head and neck cancer in primary care.[16] It recommends urgent referral for unexplained and persistent clinical features suggestive of cancer similar to the NICE guidelines or specialist opinion. Our results reflect that the majority (79%) of the referrals were made within three weeks, suggesting that both GMPs and GDPs in Ireland are aware of and adhering to the guidelines. This also indicates that GP delay is not the main contributor to the overall delay in the referral pathway, as the majority of the referrals were made within the recommended time interval.

An Irish study reported that only a low percentage of medically trained non-consultant hospital doctors (NCHDs) examine the oral mucosa of high-risk patients, and the majority are not confident due to a lack of knowledge of and clinical exposure to the prevention and detection of oral cancers.[17] Studies in the UK also report similar findings regarding the lack of knowledge and confidence in the diagnosis of oral cancer among GMPs.[18,19] The results of our study illustrated that only a minority (15%) of the referrals were made by GMPs, which may reflect a similar lack of awareness of this open door policy and referral pathway in the DDUH. In addition, two patients who visited their GMPs after noticing signs and symptoms were only prescribed antibiotics and were never referred on. The low number of referrals made by GMPs may also be due to patients first presenting to GDPs after experiencing signs and symptoms within the oral cavity. In addition, this study did not consider the direct referrals made by GMPs to the National Maxillofacial Unit at St James's Hospital. However, an incorporation of oral cancer training and clinical exposure in the medical curricula may improve diagnostic skills and confidence among medical professionals. This should include thorough oral examination in general physical examination as most oral cancer cases are reported to be detected once symptomatic, despite the accessibility and non-invasiveness of an oral examination. Thus, with an increasing incidence of oral cancer in Ireland, this highlights the need for improved education on oral cancer among medical professionals.

Half of the patients only visited a GP four weeks or more after noticing signs or symptoms, suggesting that patient delay in presentation to primary care contributed significantly to the overall delay. This is similarly reflected in recent studies whereby patient delay is usually the most significant factor in a delay to diagnosis and treatment.[9,20] Patient delay may be due to a myriad of factors such as lack of awareness, fear, or denial. In Ireland, Mouth, Head & Neck Cancer Awareness Ireland was formally launched in 2010, which aimed to involve and inform the public as well as care providers at primary, secondary and tertiary levels. Mouth Cancer Awareness Day (MCAD), which has been held yearly since 2010, involving both GDPs around Ireland and the two dental schools in Dublin and Cork, aims to increase awareness among the public as well as to educate dental practitioners. It was reported that the MCAD held in 2011 was well received, with 7,731 attendees.[21] Events such as these appear to be beneficial in increasing awareness among both the general public and dental practitioners, and additional resources should continue to be allocated amidst the increasing incidence of oral cancer in Ireland.

With an 'open door' policy adopted by the DDUH, patients are welcome to attend the A&E department with or without a referral letter regarding suspicious clinical features and will be assessed by an NCHD and specialist. Referral letters sent to the OMFS and oral medicine department are triaged as very urgent, urgent, or non-urgent based on the information provided, dictating the duration before which the patient is assessed. This has enabled a large proportion (89%) of patients to be seen within two weeks and the majority (80%) to receive an immediate biopsy procedure within the same appointment. The patients who received longer waiting times were not triaged as very urgent due to the lack of information provided on the referral letters. This highlights the importance of GPs providing thorough information on the referral letters to prevent any further delay. Such information should include: the duration, size and location of the lesion; signs; symptoms; and, presence of lymphadenopathy. In addition, this 'open door' policy has enabled the majority (89%) of patients to receive a diagnosis within a month of referral. This is in accordance with the Faster Diagnosis Standard guidelines by the National Health Service (NHS) in the UK, which aim to give patients the cancer diagnosis within 28 days of referral.[22] Hence, this policy increases the efficiency of the pathway by reducing delays, allowing for earlier diagnosis of oral cancer and improvement of survival rates. It was also reported in a systematic review that GDPs may lack skills or confidence in performing biopsies, and may be unfamiliar with varying clinical patterns of oral cancer.[15] Thus, upon suspicion of oral cancer, the immediate referral to secondary care such as the DDUH allows direct access to specialist care and is a feasible alternative approach to primary care. This standard also aligns with the updated NICE and HSE guidelines from 2015, in which patients are recommended to be sent for assessment for oral cancer within two weeks.

Conclusion

Most general dental and medical practitioners are carrying out timely referrals to secondary care, as recommended by the HSE guidelines, of within three weeks. However, only a minority of referrals were made by GMPs, which may suggest a lack of awareness and screening, or of examinations being carried out. Patient delay in terms of presentation to primary care is reported to be the main contributor to the overall delay in the clinical pathway to treatment. As early detection of oral cancer helps to reduce morbidities and improves survival rates, more emphasis should be placed on increasing public awareness, as well as improving training among medical professionals on oral cancer. Early detection can be achieved by noticing typical presentations of oral cancer, allowing timely referral at early stages of the disease. In addition, more resources should be allocated to research to understand and address the different factors contributing to patient delay. There are limitations to this review, which include the small sample size and the fact that the sample is entirely taken from the DDUH patient cohort, which may not be representative of the rest of Ireland. However, the referral pathway for the DDUH appears to be efficient, as the 'open door' policy allows for direct access to specialist care and timely diagnosis, reducing the overall waiting time and delay in the clinical pathway to treatment, and leading to better outcomes.

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CPD questions

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1. Which is the most common type of oral cancer?

- ○ A: Oral squamous cell carcinoma
- ○ B: Melanoma
- ○ C: Lymphoma
- ○ D: Polymorphous adenocarcinoma

2. Which is the major risk factor for oral squamous cell carcinoma?

- ○ A: Candida
- ○ B: Oral lichen planus
- ○ C: Smoking
- ○ D: Sunlight

3. Which type of delay contributes most to the overall delay in oral cancer diagnosis?

- ○ A: GP delay
- ○ B: Patient delay
- ○ C: System delay
- ○ D: None of the above