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Research Article

Delayed Referral of Patients with Impacted Palatal Canines

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Abstract

Objective: To assess the referral practice of general dental practitioners in the Southern region of Sri Lanka regarding palatally impacted maxillary canines.

Design:A retrospective clinical audit.

Setting: Orthodontic and Maxillofacial Unit of the Teaching Hospital, Karapitiya, Sri Lanka.

Subjects and Methods: Data were collected from 214 consecutive patients that were referred between 1st of July 2017 to 30th of June 2019. The data were compared with the clinical guidelines laid by the Royal College of Surgeons of England in 2010 regarding the referral of impacted palatal canines.

Results: 182 patients were referred concerning palatal impactions and 121(66.5% of palatal impactions) were referred later than 12 years of age which is the recommendation. The mean age of referral was 13.7years.

Conclusion: The timing of referral with regards to impacted palatal canines was significantly delayed and interventions are necessary to improve in reaching the gold standard.

Introduction

The maxillary canine is the most commonly impacted tooth apart from the mandibular third molars [1]. The incidence of impacted canines has been shown by Ericson and Kurol to be approximately 2%,[2] and is twice as common in females as males [3]. As evident in the literature, 85% of the canine impactions are palatal and 15% are buccal[4]. The aetiology of impacted palatal canines is not distinct but usually thought to occur due to inadequate space in the upper arch to accommodate the tooth. Also it could be due to the long developmental path of the tooth, [5]the lack of guidance from the lateral incisor root[6]or could also be due to an altered position of development of the canine resulting from polygenic inheritance [7].If not treated, especially those with palatal impactions would probably cause resorption of the adjacent permanent teeth and apparent loss of them may ensue. The occurrence of incisor root resorption due to ectopic canines is reported to vary between 12.5-48% [8]. The incidence varies widely depending on the technique used as there might be superimpositions especially from those of the lateral incisor roots and the crown of the impacted canine [9]. Therefore when compared with conventional plain radiographs, resorption has been reported to be up to five times higher in Cone Beam Computer Tomography (CBCT) [10].

Moreover, if an impacted canine is left untreated, there is also the added possibility of litigation for the referring practitioner as they might be found to be negligent in the detection or referral. On the other hand, management of impacted canines often necessitates surgical intervention to expose the tooth or to surgically remove it. Surgical exposure is frequently followed by protracted orthodontic treatment times to align the tooth. This sort of treatment is complicated, wastes valuable clinical time, patient burn out may occur, has cost implications and comprises the possible of risk of damage to the adjacent teeth [11] Furthermore, aligning an impacted canine could compromise the periodontal condition of the tooth [9]. Thus prevention and interceptive management of an impacted canine is at all times desired to its treatment. The correct timing of referral is therefore imperative to ensure patients receive the most appropriate care [11].

There is good quality evidence to suggest that if diagnosed early, interceptive management may relieve the impaction of the permanent canine [4]. Moreover, trials have been done in both uncrowded and crowded arches and has shown that around 78% in uncrowded mouths [4] and in crowded situations 62% of palatally impacted canines erupted subsequent to the removal of the deciduous canine [12]. Almost all the studies have shown that the effect of intervention depended on a number of factors, with the patient's age at identification being the most important [2,4,9,11]. Consequently clinical guidelines have been published by the Royal College of Surgeons of England on 'Management of the Palatally Ectopic Maxillary Canines' in 2010 stating that patients with suspected impacted maxillary palatal canines should be referred by age 12 or under [13]. By age 12, it is expected that the permanent maxillary canine would have erupted. Accordingly early referral could lead to simple, less invasive treatment options in its management.

Aims: As there were publications indicating that many patients were being referred late the aim of this first audit cycle was therefore

a. To assess the efficiency of the referral practice of general dental practitioners.

b. To establish whether the local general dental practitioners (GDPs) diagnosed the problem prior to the referral.

c. To perceive if there was any significant delays in the initial patient consultation.

Following the audit, we aimed to develop further educational programs and then to execute a re-audit to evaluate the implementation of the guidelines in improving GDP referral practices.

Materials and Methods

This was a retrospective audit done at the Orthodontic Unit and the Oral and Maxillofacial Unit of the Teaching Hospital, Karapitiya from 1st of July 2017 to 30th of June 2019. All consecutive patients that were referred with impacted maxillary canines from the 1st of July 2017 were recruited. Patients with cleft lip and/or palate, and those with orofacial syndromes were excluded from the study.Consent and/or assent were obtained by the principal investigator from patients who were diagnosed as having at least one impacted canine and data was collected using a proforma.

Results

In this study a total number of 214 patients with impacted canines were encountered during the one year period of observation and they amounted for almost one fifth of the referrals (4320) made to the TH- Karapitiya. 85% (182) of the referrals regarding the canines were related to palatal impactions (Figure 1). When considering the palatal impactions, 93 patients (43.5%) were referred at or before the age of 12, but 121(56.5%) patients were referred at the age of 13 years or later than the commendations made by the Royal College Guidelines. The mean age of referral was 13.7 years, which was later than the recommendation.(Figure2). From the 121 cases that were referred late, no more than 28(23%) cases were diagnosed by the GDP as having an impacted canine or included any information in the referral letter relating to the location of the canines assessed by palpation. Also 95 (78%) of the cases had the deciduous canine retained at the time of the examination.

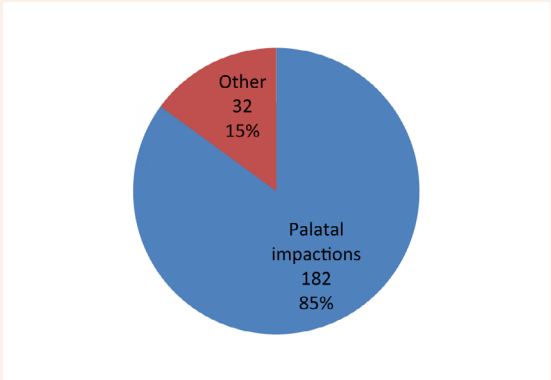

Figure 1: The number of impacted canines that were referred.

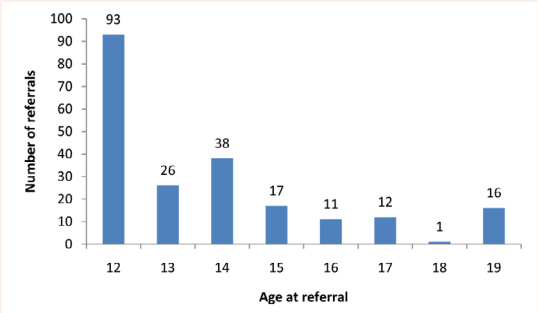

Figure 2: Number of referrals according to the age at referral.

Of the total sample of 214 patients, 135(63%) were female and 79(37%) were male, with a consequent male: female ratio of 1:1.7. A total of 94 patients (44%) were referred regarding bilateral impacted canines and the remaining 120 patients (56%) were referred for one ectopic canine only. Waiting time lapsed from referral to treatment was calculated from the date of referral to the date of the initiation of treatment followed by consultation. 91% of patients were seen and treatment commenced within 12 weeks of referral.

Discussion

The aim of our study was to determine if the referrals regarding impacted maxillary canines were appropriate and in accordance with the guidelines. But the overall referral pattern was very poor and the results are disappointing as the referral times were significantly delayed at 13.7 years when the recommendation is 12 years or younger. In our study 56.5% of the patients that were having impacted canines were referred late than the recommendation and 77% of the referral letters had no indication of the impaction including the bulge which should have been palpated. Essentially the bulge of the canine should be palpated by 10 years of age as it might be one of the best indicators of the position of the erupting canine and hence would be an indication for interception. It is apparent that the deferred referral pattern directly compromises the treatment options that could have been offered to most of the patients. Many had lost the opportunity to undergo interceptive treatment which is definitely less invasive and would encourage eruption of the canine as is observed in a recent randomized clinical trial [14]. Devastatingly the delay in diagnosis and referral could cause or worsen the impaction of the canine and would eventually fall under the grade 5 of the Index of Orthodontic Treatment Need [15] indicating a severe dental health problem.

Therefore it is quite evident that the referral pattern needs to be improved as we are far behind the gold standard. Scientific literature holds evidence to improvement in the total number of patients being referred following the implementation of guidelines subsequent to audits [16,9]. According to them it would increase the awareness of the dentists in the management of such patients. However successful implementation of the guidelines requires an effective dissemination strategy [17].It is generally agreed that provision of information alone is ineffective in implementing changes. Additional interventions such as educational meetings, provision of algorithms on when to refer (Figure 3), outreach clinics, and constant clinical reminders would further improve the outcome [9]. If those using the guidelines are involved in sharing suggestions to improve the referral pattern, much improvement could be expected[18].

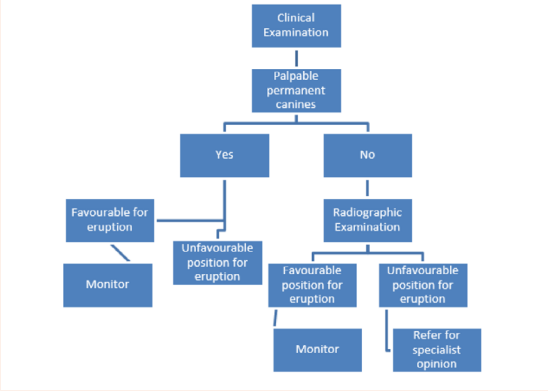

Figure 3: Algorhythm to determine which patients require referral.

Conclusion

In the population concerned the first audit cycle revealed an undesirable delay in referring palatally impacted maxillary canines compared to the recommended guidelines imposed by the RCSEng 2010.

Accordingly the authors propose the following recommendations;

a. The information regarding the guidelines and the audit findings should be disseminated through post as most of the general dental surgeons might not be aware.

b. Gaining support from the regional dental services to enforce information regarding the guidelines and to execute a series of educational and training programs targeting the general dental surgeons of the area including meetings or discussions about the significance of appropriate timing of orthodontic referral.

c. An algorhythm could be introduced to the referring practitioners to assist in decision making on when to refer an impacted canine.Collaborate with the referring clinicians and share suggestions to improve the referral system.

d. When a delayed referral is encountered, a letter to the referring practitioner should be sent. This letter should include an algorithm for when to refer a suspected impacted maxillary canine.

A second audit cycle to be conducted 2 years following the implementation of changes to assess the effectiveness.

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