

Bilaterally impacted permanent mandibular canines: A report of two cases

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Abstract

Background: Impacted canines are commonly implicated in malocclusion in the anterior region of the jaws.

Aim: To present the surgical and orthodontic management of two cases of bilaterally impacted mandibular canines which resulted in lower anterior segment crowding.

Methods: Case report and review of the literature.

Results: Two cases of bilateral mandibular canine impaction are presented in this report. The positions of the crown of the canine in both the patients were between the cervical margin and the apices of the roots of the adjacent teeth. There was also transmigraton of both bilaterally impacted canines in one patient. The impacted canines were removed surgically to complement orthodontic treatment.

Conclusion: The cases reported emphasize the option of surgical extraction as a treatment modality when dealing with impacted mandibular canines. Evaluation of both cases 3 years post-treatment revealed an improved, stable, functional and aesthetic outcome.

Keywords: Canines, exodontia, impaction, mandible, transmigraton

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Received: 18.07.2017, **Accepted:** 31.07.2017

INTRODUCTION

Bilaterally impacted mandibular canines are an unusual occurrence which has been implicated in crowding, spacing and root resorption, rotations, tilting and migration of the adjacent teeth.¹⁻³ Some cases have been reported to result in periodontal and gingival problems, especially in partially erupted teeth, and also severe anterior segment crowding and referred pain.^{2,4,5} The incidence of bilaterally impacted mandibular canines has been found to be as low as 0.12%,⁴ which is much below the percentages of impactions of the mandibular and maxillary third molars, maxillary canines and mandibular second premolars in a descending order.² Previous studies did not show gender differences. Aydin

*et al.*¹ and Yavuz *et al.*⁴ reported a male-to-female ratio of 1:1.22 and 1:1, respectively. The mean ages of impaction vary between 25.3 years and 32.7 years.^{1,4} Although most are detected incidentally on routine radiographs,³ others are as a result of clinical problems which include malocclusion, cement-ossifying fibroma, odontogenic and dentigerous cysts and odontogenic and adenomatoid odontogenic tumours.^{5,6}

The presentation of impacted mandibular canines is based on whether it is unilateral or bilateral, with the latter being rarer in incidence. Even more unique is the transmigraton and impaction of both mandibular canines, with studies suggesting five types depending on its path of deviation.^{4,7,8}

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How to cite this article: Osaguona AO, Ize-Iyamu IN. Bilaterally impacted permanent mandibular canines: A report of two cases. Port Harcourt Med J 2017;11:107-10.

Access this article online

Quick Response Code:



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DOI:

10.4103/phmj.phmj_26_17

Of 4500 cases of impaction, only 14 cases (0.31%) were transmigrated canines showing more mandibular and male preponderances.¹ The angulation, depth and spatial position also determine the treatment options and outcomes. The classification helps to determine the modalities for management which include observation with intermittent radiographic evaluation, orthodontic traction after surgical exposure, surgical extraction and re-implantation.⁹

It is the aim of this article to present the surgical and orthodontic management of two cases of bilaterally impacted mandibular canines which resulted in lower anterior segment crowding. A search of the literature revealed only a case report of transmigration in a 12-year-old Nigerian child.¹⁰ The case in this series may probably be the second reported case in Nigeria. A 3-year posttreatment outcome demonstrated the resolution of the orthodontic problem. The management of these cases will add to the literature on the subject and also encourage this treatment modality as an option for a functional and stable occlusion.

CASE REPORTS

Case 1

A 10-year-old female presented to the Orthodontic unit of the Department of Preventive Dentistry with an overjet of 8 mm, a deep and traumatic overbite and severe crowding of the lower arch with the mandibular lower right and left canines (teeth 43 and 44) missing. There was a palpable lingual bulge on the right and none on the left. The lower left and right central incisors were distolabially rotated. Cephalometric analysis revealed a normal maxilla and mandible in relation to the cranial base, but the orthopantomogram (OPG) showed bilaterally impacted mandibular canine transmigration – Type 1 (canine was positioned mesioangularly across the midline within the jaw bone and lingually and labially positioned on the right and left, respectively).⁸ The canines also demonstrated a level B position (the depth of the crown of the impacted canine bilaterally was between the cervical line and the root apices of the right and left central incisors).⁶ The OPG also revealed rotated mandibular canines with open root apices close to the lower border of the mandible and impinging on the roots of the lower right lateral incisor and lower left central incisor, respectively [Figure 1]. A decision was made for upper and lower fixed orthodontic treatment to correct the increased overjet and unravel the lower arch crowding. The normal protocol for extraction would have been the first premolars, but a decision to remove the unfavourably positioned canines was taken. Both canines were removed through an intra-oral buccal approach under

general anaesthesia [Figure 2], and 4 months postextraction, the lower occlusal radiograph demonstrated good bone formation [Figure 3]. Orthodontic brackets were placed for levelling and alignment of the crowded and malaligned teeth [Figure 4]. Total orthodontic treatment time was 24 months with a final overjet of 4 mm and a normal overbite with well-aligned upper and lower arches.

Case 2

A 10-year-old male presented to the paediatric dentist with a 3-year history of enamel dentine fracture of the central incisors. Further evaluation showed a pegged shaped left permanent maxillary lateral incisor (tooth 22), a lingually displaced right permanent mandibular lateral incisor (tooth 42), a mobile left deciduous maxillary canine (tooth 63) and missing bilateral permanent mandibular canines (teeth 33 and 43). The incisal relationship was class II division I with an overjet of 11 mm. There was a lower midline shift to the left of 4 mm. Routine OPG [Figure 5] revealed bilaterally mesioangularly impacted mandibular canine with open apices (level B). Both mandibular canines were planned for removal under local anaesthesia since there was a lack of space for further eruption, and all the mandibular premolars were fully erupted. The surgical approach was a buccal approach by raising a three-sided mucoperiosteal flap. Healing was uneventful, and 4 months later orthodontic brackets were placed to correct the anterior segment crowding. OPG taken 3 years after the surgical procedure shows good alignment and acceptable outcome [Figure 6].

DISCUSSION

Delayed eruption of a tooth beyond its chronologic time of eruption into the oral cavity is called impaction. This has been linked with local and generalised factors. These are discrepancies in tooth size and arch length, delay in exfoliation or early loss of primary tooth, abnormal position of tooth bud, presence of alveolar cleft, ankylosis, cyst and neoplasm, trauma, dilacerations of roots, iatrogenic origin and idiopathic condition.⁹ Generalised factors are hinged on genetic and familial causes. Generalised diseases include endocrine disorders, febrile illness and irradiation.^{4,9} No systemic attributable cause was found in the cases presented.

Bilaterally impacted mandibular canines may be classified based on the angulation of the canines to the long axis of the lateral incisor in which case it may be mesioangular, distoangular, vertical or horizontal.⁴ The position of the canine in the first case presented in this report was mesioangular for the right canine and distoangular for the



Figure 1: Transmigration of the lower canines



Figure 3: Standard lower occlusal radiograph taken 4 months after surgery showing adequate bone density below the apices of the mandibular incisors



Figure 5: Orthopantomogram of case 2 showing bilaterally impacted canines with open apices

left canine. All the impacted canines in both cases were however vertically placed with open apices. Both patients presented at the age of 10-years. At this age, it is expected that the root apices should be open;^{4,7} however other factors also contribute to the treatment outcome and the long-term prognosis of these teeth.¹⁻³

The depth of the impacted canine is also an important factor in determining treatment options and prognosis. Three variants were described by Yavuz *et al.*,⁴ with level A determined as the position of the crown of the impacted canine tooth at the cervical line of the adjacent teeth. Level B is the distance of the crown of the impacted canine tooth and where it lies between the cervical line and the



Figure 2: Surgical extraction of transmigration of lower right canine



Figure 4: Intraoral view of aligned lower arch 10 months after placement of orthodontic appliance

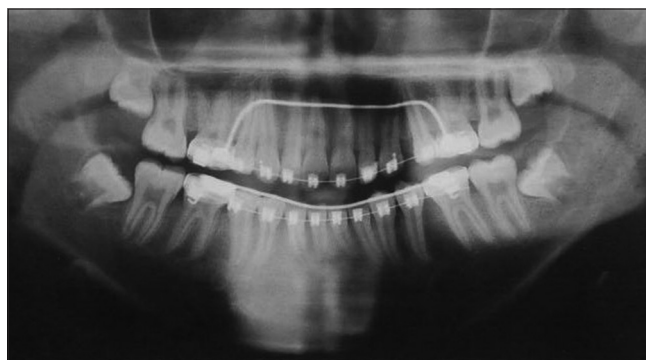


Figure 6: Orthopantomogram taken 3 years postextraction showing good dental alignment

root apices of the adjacent teeth. Level C was described as when the crown of the impacted canine is beneath the root apices of the adjacent teeth. This current study for both cases (1 and 2) identified the depth as level B. This is in agreement with other studies where level B was the most common depth seen in impactions.^{4,8}

Another classification of mandibular canines identified transmigration as a clinical entity depending on its

path of deviation and was described by Mupparapu.⁸ Five types were labelled, with Type 1 being the most common and classified as when the canine is positioned mesioangularly across the midline within the jaw bone, either labial or lingual to the anterior teeth, and the crown portion of the tooth crossing the midline. Type 2 is described as when the canine is horizontally impacted near the inferior border of the mandible below the apices of the incisors and is seen in 20% of impactions. The other classification includes Type 3 with the canine erupting either mesial or distal to the opposite canine. Type 4 is when the canine is horizontally impacted near the inferior border of the mandible and below the apices of either premolars or molars on the opposite side. Type 5 which is the least common and seen in 1.5% is described as when the canine is positioned vertically in the midline with the long axis of the tooth crossing the midline irrespective of the eruption status.^{1,6,8} This current report identified transmigration Type 1 in Case 1 and is consistent with other cases reported where a high prevalence rate was observed.^{6,11} Case 2, which is not transmigrated, does not fall into any of these categories defined by Mupparapu.

Studies have shown that impacted mandibular canines may result in malocclusion^{3,4} and also in other forms of pathological transformation.^{4,5,11} This study however identified only malocclusion, with anterior arch crowding as the primary complaint. While other methods of management exist for impacted canines, the depth, degree of deviation and stage of development are important factors.^{1,4,7,12} While both cases 1 and 2 had open apices, the angulations and depth were unfavourable for orthodontic extrusion.^{12,13} Surgical extraction and autotransplantation¹² which would have been an option were however not applied because of an existing malocclusion with insufficient space for placement. The anterior arch crowding required extraction, and the first premolars would have been the teeth of choice but the impacted canines which had a poor prognosis were extracted surgically instead through an intraoral labial approach.¹⁴ Case 1 was done under general anaesthesia [Figure 2] while case 2 was managed under local anaesthesia. These management options utilised demonstrated that each case has its own uniqueness, and the strategies deployed depend on individual variations. Meticulous evaluation with radiographs would assist in effective management.¹³⁻¹⁵

In conclusion, two cases of an unusual impaction of bilateral mandibular canines and transmigration detected

during orthodontic evaluation are presented. These case reports underscore the importance of radiographic evaluation of all teeth with the OPG so that timely surgical and orthodontic treatment can be undertaken.

Acknowledgements

The authors would like to thank Dr. Aghogho Isuekevbo for retrieval of pictures and radiographs and Dr. Joseph Otaren for scheduling patients' appointments.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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