

Unprecedented Encounter of Dual Ipsilateral Mandibular Impacted Teeth: A Case Report

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ABSTRACT

An impacted tooth is defined as a tooth which fails to erupt partially or completely into its correct position in the dental arch, and its eruption potential has been lost. Impaction of teeth is a common dental issue, but the simultaneous impaction of two teeth on the same side is relatively uncommon, particularly when involving different tooth types are involved. Hereby, the authors present a case report of a 21-year-old female patient with a rare occurrence of dual ipsilateral mandibular tooth impactions involving a premolar and a canine. Both the impacted premolar and canine were surgically exposed, followed by extraction of one to allow for proper orthodontic alignment and correction of the patient's occlusion. The report highlights the successful diagnosis and surgical management of complex dental impactions through radiographic analysis and a minimally traumatic extraction techniques in managing complex dental impactions. The patient showed favourable recovery and alignment, post-treatment underscore the value of a multidisciplinary approach integrating surgical and orthodontic planning.

Keywords: Impacted tooth, Malocclusion, Oral surgical procedures, Orthodontia, Tooth extraction

CASE REPORT

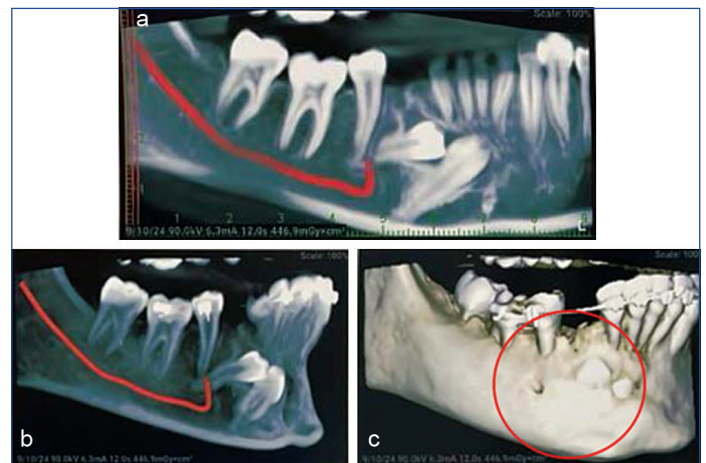
A 21-year-old female presented to the Outpatient Department of Oral and Maxillofacial Surgery with the chief complaint of malaligned teeth along with food lodgement occasionally. The upper and lower right quadrants had malaligned teeth since 5-6 approximately 5-6 years. The patient had no significant medical history and exhibited good general healthy. She had been undergoing orthodontic treatment in the Department of Orthodontics at study Institute for the past 10 months, but optimal space management could not be achieved due to severely impacted teeth in both the jaws.

Clinical examination revealed a Class I molar relationship with mild crowding in the mandibular arch. Panoramic radiography [Table/Fig-1] confirmed two impacted teeth—the right first premolar and canine—both encased in a well-defined radiolucent lining that appeared continuous in appearance, suggestive of the cyst-like lesion. Notably, these structures were in close anatomical proximity to the inferior alveolar canal and extended near the mental foramen, varying consideration for potential neural involvement.

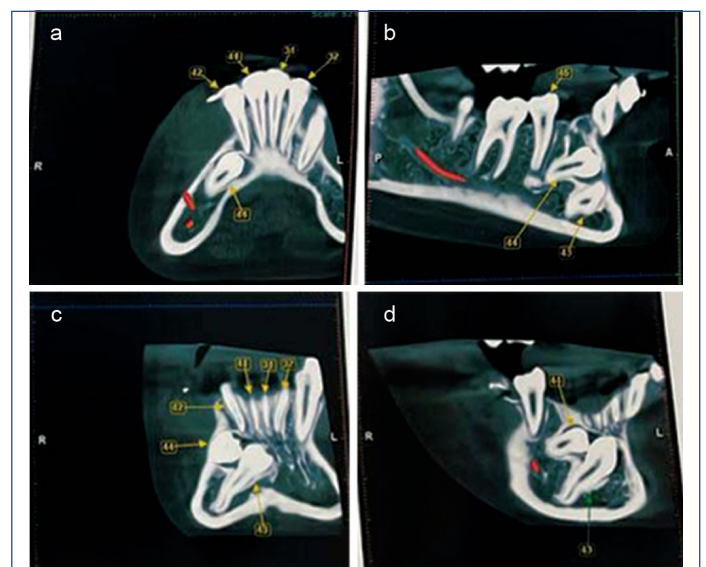
This led to a diagnosis of severe impaction in association with completely embedded mandibular 43 and 44 superoinferiorly and mesiodistally, was made. Cone-beam Computed Tomography (CBCT) confirmed the diagnosis and determined the precise localisation and proximity to vital structures [Table/Fig-2a-c, 3a-d].



[Table/Fig-1]: Panoramic radiograph showing impacted dual ipsilateral teeth with radiopaque cyst like lining, marked circle shows 43, 44 with surrounding cystic lining/dental follicle.



[Table/Fig-2]: a,b) CBCT images of right mandible showing exit path of the mental nerve in relation to impacted premolar and second premolar; c) 3D reconstructed image, marked circle showing the mental foramen and impacted teeth in proximity to it.



[Table/Fig-3]: a) Axial cut showing placement of the impacted tooth buccolingually and the mental foramen; b) Sagittal cut showing impacted teeth in relationship to adjacent teeth and with the inferior alveolar canal; c,d) Coronal section showing proximity of the impactions with inferior alveolar canal and the mental foramen.

A surgical extraction with exposure and extraction of the teeth was planned under local anaesthesia (2% lidocaine). An inferior alveolar nerve block with deposition of approximately 2 mL of solution. A No. 15 blade was used to place a vestibular incision extending from tooth 41 to distal aspect of tooth 45, and a full-thickness mucoperiosteal flap was raised. Impacted teeth were exposed, to perform extraction of the canine, which required sectioning [Table/Fig-4,5]. Careful exposure due to proximity to the mental foramen, careful dissection was performed.



[Table/Fig-4,5]: Showing incision marking (dotted line) and flap reflection which has exposed the impacted teeth 43 and 44 (Images from left to right).

Once the teeth were removed, socket curettage was done, and thorough irrigation with an antiseptic solution [Table/Fig-6], followed by flap repositioning and closure with absorbable vicryl 2-0 sutures [Table/Fig-7].



[Table/Fig-6]: Extraction of the impacted mandibular right canine and preservation of the first premolar along with mental nerve which can be appreciated followed by removal of the canine and keeping the first premolar intact.



[Table/Fig-7]: Closure with 2-0 vicryl sutures.

Postoperative healing was uneventful, and orthodontic correction was continued to address crowding and restore functional occlusion [Table/Fig-8]. Authors preferred surgical disimpaction was preferred over orthodontic adjustment due to several critical factors discussed with the treating Orthodontist. Patient was duly explained the procedure, and consent was obtained.



[Table/Fig-8]: Postoperative Intraoral Periapical (IOPA) radiograph showing wire applied on the first premolar bringing the tooth into alignment.

Firstly, the teeth were located close to vital anatomical structures, increasing the risk of nerve damage. A well-defined cyst-like cavity surrounding the teeth posed a potential risk for pathological expansion, infection, or resorption of adjacent roots. Additionally, the angulation of canine impaction further complicated its retrieval and alignment within the arch, making orthodontic traction a less predictable and more time-consuming option with uncertain outcomes. Therefore, the removal of one impacted tooth paved way for alignment of the one associated with the neural structure, thereby avoiding injury with smooth orthodontic movement.

DISCUSSION

Impacted mandibular premolars and canines are relatively rare compared to maxillary teeth [1]. The incidence of maxillary canine impaction is widely documented, mandibular canine impaction remains a relatively rare phenomenon, with an occurrence rate from 0.008% to 1.29% [2]. However, recent there has now been documentation stating an increase the prevalence and incidence of mandibular canine impactions, with unilateral cases being more common than bilateral ones [3,4]. Similarly, the impaction of the premolar is uncommon and its prevalence of approximately 0.5% in adults, and 0.2-0.3% specifically for mandibular premolars [5]. Dual impactions on the same side are even less common, presenting unique diagnosis, treatment planning, and management challenges.

The aetiology of dual ipsilateral impactions is multifactorial and may involve:

- Inadequate arch space: crowding or discrepancy in arch length often predisposes to impactions;
- Ectopic eruption: malpositioning of the tooth germ can prevent proper eruption;
- Genetic predisposition: familial patterns have been observed in some instances.

The prevalence of mandibular canine impaction among orthodontic patients is around 1%. While the individual prevalence of mandibular premolar and canine impactions is low, simultaneous ipsilateral premolar and canine impactions are exceedingly rare, with only a few cases documented in the literature [6].

Diagnosis requires a high index of suspicion. Clinical examination may be inconclusive due to the absence of visible crowns or

symptoms. Radiographic diagnosis for the presence and position is a crucial and indispensable part of integral treatment planning. Panoramic radiographs can be used as valuable predictors of the outcome of the impacted teeth position as they show the location and change in morphology, if any. CBCT offers detailed localisation and an assessment of proximity to critical structures such as the inferior alveolar nerve and the mental foramen. Custom-made drill guides have been used effectively for surgical disimpaction of mandibular premolars, enabled accurate access, reduced operating time, and avoided unwanted complications [7].

There could be instances when orthodontic correction is not possible, and surgical extraction becomes the only viable option like in present article, due to the severely unfavourable position of the transversely impacted second premolar, orthodontic treatment was not considered a viable option, and extraction was necessary [8]. Correcting ectopically impacted mandibular canines is difficult yet attainable with careful biomechanical planning. Early intervention can help avoid more complex orthodontic challenges caused by abnormal eruption paths [9].

Surgical extraction and orthodontic traction are the most used treatment modality with the later showing a failure rate of 17% [10]. Managing dual ipsilateral impactions prioritises the preservation of adjacent structures. Minimising trauma to adjacent teeth and vital structures is crucial, particularly given the complex anatomical relationship of mandibular teeth to the alveolar nerve. There has been evidence describing the successful interdisciplinary management of a patient with complex mandibular anomalies, including extraction of a transmigrated canine, autotransplantation of a maxillary premolar using a 3D-printed template to minimise surgical time and manipulation, and orthodontic protraction to achieve functional occlusion and pleasing aesthetics [6]. Accurate diagnosis combined with effective biomechanics allows for the successful alignment of transmigrated and impacted canines while preserving adjacent teeth, and comprehensive orthodontic care can achieve an attractive smile with limited need for additional restorative or surgical procedures [11].

In the present case, removal of one impacted tooth reducing surgical difficulty and improving outcomes. Post-extraction orthodontic alignment for addressing postextraction space and arch integrity is critical for achieving functional and aesthetic restoration. Complications such as local infection, involving surrounding tissues, long treatment times and costs to the patient should be anticipated. The success of post-surgical orthodontic correction postsurgery further underscores the importance of a multidisciplinary approach [12,13].

CONCLUSION(S)

The present case demonstrates the successful application of minimally invasive surgical techniques in managing rare dual ipsilateral impactions. CBCT provided precise preoperative planning, and the staged surgical approach minimal complications. More studies are needed to explore the prevalence and best practices for managing rare impactions. Advances in imaging and surgical techniques hold promise for improving outcomes in similar cases. A multidisciplinary approach for severe impactions should be carried out considering optimal orthodontic, surgical and patient related factors for satisfactory and favourable results.

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