Journal of Oral Medicine and Dental Research

Genesis-JOMDR-3(1)-21
Volume 3 | Issue 1
Open Access
ISSN: 2583-4061

Conservative Management of Impacted Teeth: Report of 9 Cases

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Citation: Pinto M, Lee K. (2022) Conservative Management of Impacted Teeth: Report of 9 Cases. J Oral Med and Dent Res. 3(1):1-11.

Received: March 09, 2022 | **Published:** May 10, 2022

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Abstract

Background: Impacted or blocked out teeth present a challenge in orthodontic treatment. Impacted/ blocked out teeth have an impact on the functional loss of the missing tooth and also the loss of alignment and function of adjacent and opposing teeth. There are various treatment options to manage an impacted tooth such as observation, intervention, relocation and extraction. Often just creating a space for the impacted or blocked out teeth results in a spontaneous resolution of the impaction or an easily corrected alignment without the need for extractions.

Aim: The purpose of this article is to present cases with different situations and the conservative interventional treatment options and considerations.

Discussion: Impacted teeth are a deviation from normal physiological eruption.

Keywords

Etiology; Canine; Impacted teeth

Introduction

The etiology of impacted teeth can be primarily due to dentofacial developmental abnormalities, genetics, endocrine deficiencies, clefts, delayed root development, discrepancy in jaw development. Teeth can also secondarily get impacted due to crowding, space reduction from premature loss of the preceding deciduous tooth, root or coronal pathology, ectopic position of the tooth bud, fibrous tissue preventing eruption.

In literature, the incidence of impacted teeth excluding third molars is reported to be between 2.9% to 13.7% [1-10]. The most frequently impacted teeth reported in literature are the canines and second premolars in both arches [3-5,7-13].

Diagnosis of an impacted tooth starts with a clinical exam and correlating any missing or unerupted teeth to the eruption cycle. Often impacted supernumerary teeth are diagnosed on scans or x-rays and also may be associated with displaced adjacent teeth. 3D scans are invaluable in determining the position of impacted teeth, surrounding structures and to determine if the impacted tooth is causing resorption in the roots of adjacent teeth. The absence of a canine bulge should not be used as a marker for an impacted canine in younger children [14].

There are many variables affect severity of an impacted tooth and thus plays a role in determining the treatment of an impacted tooth [15].

1. Position of the impacted tooth: The vertical, horizontal and angular position of the impacted tooth influences the duration and complexity of treatment.
2. Age: With increasing age and time, the angle of the impaction may become more severe. This is particularly seen in the case of canine impactions.
3. Gender: Females are more likely to have impacted maxillary canines.
4. Tooth agenesis: Reduces the severity of impactions.
5. Microdontia in maxillary lateral incisors: Interestingly it impacts the impaction of the mandibular second premolar and not the maxillary canine.
6. Retained deciduous teeth: Retaining the deciduous second molar greatly reduces the incidences of impaction of the second premolar. While a retained deciduous canine increases the severity of the permanent mandibular canine.

Treatment of impacted teeth: It is important to assess patients for possible impacted teeth because early diagnosis reduces the complexity of the impaction. After assessing the impacted tooth, its complexity, the age of the patient, the adjacent and opposing teeth the clinician can make a decision on the management of the impaction. The treatment options are no treatment with observation, interceptive treatment, surgical exposure and orthodontic alignment, extraction of adjacent or impacted teeth, auto transplantation.

Before intereptive treatment, there should be enough space in the arch for the impacted tooth to erupt into or be orthodontically aligned into. No treatment: If there is no sign of pathology like cystic changes, the adjacent teeth are not affected, no sign of root resorption, and the age of the patient may warrant

leaving the impacted tooth with just regular radiographic monitoring.

Interceptive treatment: There is a lot of literature on impacted canines. If the patient is young then extracting the deciduous tooth gives the impacted tooth a chance to erupt particularly in the case of canines. There is less success if the canines are placed more medially and in older patients. The angulation of the impacted tooth or ankylosis also determines whether the impacted tooth will erupt. X-rays should be taken 6 monthly and if there is no improvement in 12 months alternative treatment should be considered.

There is a lot of literature on the treatment of impacted canines. Orthodontic treatment of a blocked-out canine is very challenging. Space needs to be created, anchorage is difficult, midlines are often shifted. In case the midline is shifted to the crowded side care should be taken not to extract prior to the midline being corrected. The canine root is very bulbous and hard to move bodily which may need frictionless mechanics and a flexible wire. The buccal bone is thin and there is a high chance of dehiscence. You need light forces, sectional wire, frictionless mechanics, and palatal root torque. The canine should be allowed to erupt spontaneously rather than be extruded to avoid gingival recession [16].

In literature some authors have reported that rapid palatal expansion with cervical pull headgear to hold the posterior segments back has shown to be effective after extraction of the deciduous canine in resolving an impacted canine. While others have shown that in 65% just extracting the deciduous canine resolved without treatment.

Extraction: If the patient declines treatment, the impacted tooth is causing resorption of adjacent roots, if the roots are severely dilacerated, if the tooth is ankylosed, there is good contact between the adjacent teeth, then it may be indicated that the impacted tooth be extracted. It is contraindicated to extract a labially blocked or impacted canine because of the canines play an important roll in soft tissue and lip support and functional occlusion. If the canine space is being replaced with a premolar, then extrusion of the premolar provided the premolar crown is long with prominent buccal cusps, , slight negative crown torque with a rotation that is mesiopalatal is recommended to make it look more like a premolar.

Auto transplantation: If the other treatment options are not viable or the patient is not keen on treatment or implants, there is enough space for the canine. Not as successful in adults. Endodontic treatment is necessary if the apex is closed. Resorption and ankylosis are potential complications.

Conclusion

The following cases demonstrate impactions of various impacted teeth and their successful conservative management.

Cases

Case 1: Initials: FV, blocked out mandibular incisors

Extraction of a mandibular incisor could result in black triangles, a discrepancy in the midline, bite deepening, a reduction in the intercanine width, and affect canine guidance [17]. Hence it was decided to align the teeth with fixed orthodontics with minimal interproximal reduction to make space.

This case was a 12-year-old boy who came to the clinic for crowding. Tooth #13 and tooth #23 were not erupted and his lower incisors were blocked out. The maxilla was expanded with an expansion plate to make room for the canines while in the lower jaw the space was gained by minimal interproximal reduction and then fixed orthodontics to line up the teeth. The patient is still in fixed treatment (Figure 1).

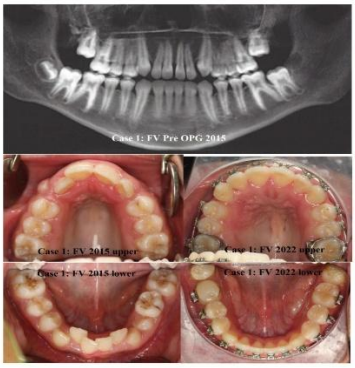

Figure 1: Case 1, FV pre and post photos, pre OPG.

Case 2: Initials: EP,impacted canines

This was an 11-year-old girl that presented because she had missing canines. Scans showed that both the canines were palatally placed with tooth #13 tip just halfway overlapping the root of tooth #12, while tooth #23 was well past tooth #22 and further medially towards tooth #21. The maxilla was found to be deficient sagitally and transversely and the treatment plan was to expand the maxilla to an ideal size and shape in both the directions with expansion plates and then the teeth were aligned with fixed braces. The parents were warned that there was a chance that tooth #13 may spontaneously erupt but tooth #23 would probably need to be guided into the arch. The parents were warned of the extended time frame and possible complications of root resorption, devitalization and ankylosis. Tooth #13 erupted spontaneously as predicted and tooth #23 was surgically exposed and guided into place with anchorage from the archwire and a buccally placed TAD (Figure 2-5).

Figure 2: Case 2, EP pre OPG 2012.

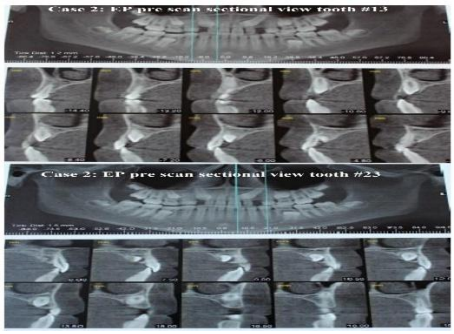

Figure 3: Case 2 EP, pre scans slide.

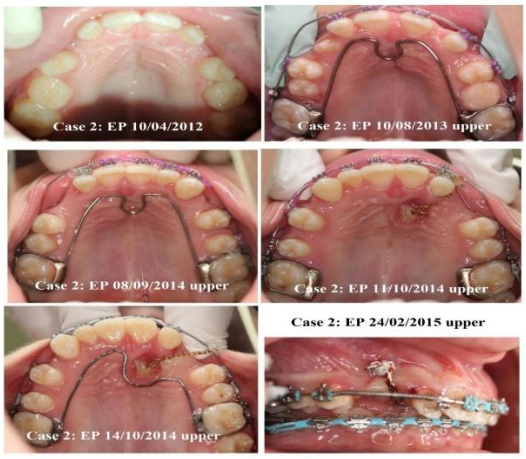

Figure 4: Case 2, EP progress photos.

Figure 5: Case 2, EP progress photo (2).

Case 3: Initials: AD, impacted canines

This was a 19-year-old male with impacted canines and over retained deciduous canines. A scan showed that both the canines were palatally placed. An assessment of his maxilla showed that there was a deficiency in the transverse plane. The patient was warned that given his age it was possible the canines would not spontaneously erupt and that surgically exposing the canine and dragging it into the arch could result in devitalization of the tooth. He was given alternative treatment options of extracting the canines and replacing them with implants. The patient was willing to consider implants. The patient was very hesitant to extract the deciduous canines as recommended and because the plan was to replace

the teeth with implants, we left the canines in for longer.

However, with expansion tooth #13 moved buccally from a palatal position and could be palpated under the buccal mucosa, so we extracted the deciduous canines and the tooth #13 was guided into the arch. Tooth #23 was surgically exposed and guided into the arch with anchorage from the arch wire. The patient is still in the fixed phase in his treatment (Figure 6,7).

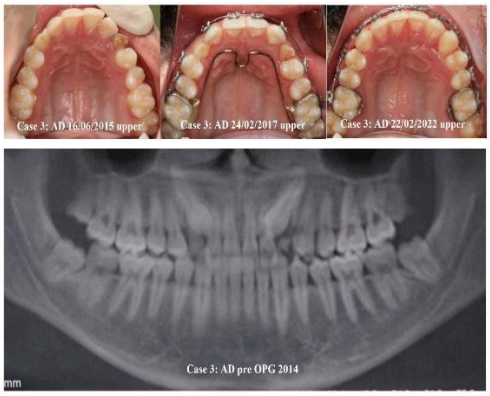

Figure 6: Case 3, AD pre and post photos, pre OPG 2014.

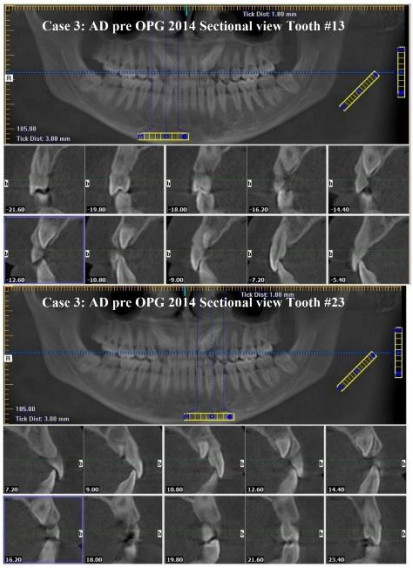

Figure 7: Case 3, AD pre scan slides.

Case 4: Initials: NM, impacted lower canine and premolars

This was a 12-year-old girl that had a chief complaint of very small jaws. She had seen another clinician and had tooth #13 extracted because it was impacted very high and was causing root resorption in tooth #14. She is also missing tooth #12 with a retained tooth #52. She was tipped to have more teeth extracted in order to allow eruption of the second premolars and remaining canines. Her parents were keen not to have any more teeth extracted so it was decided to expand the maxilla and, also wear an expansion plate in the lower to allow the teeth to tip vertically to create more space. All her teeth

erupted spontaneously once space was created. The teeth are being aligned with fixed braces and clear aligners and once she has finished active growth she will have implants placed in the tooth #12 and tooth #13 regions (Figure 8).

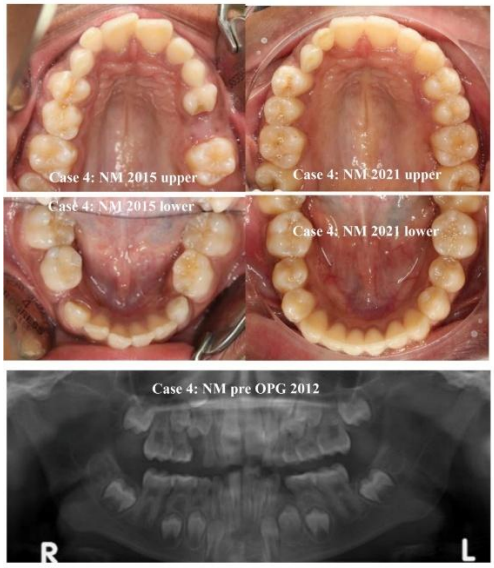

Figure 8: Case 4, NM Pre and post photos, pre OPG 2012.

Case 5: Initials: AT, impacted second premolars

This patient was a 11-year-old girl seen because there was no room for her premolars #14, #45, #35. The maxilla and mandible were found to be constricted in the transverse direction. Both jaws were treated with expansion plates. In the lower it was mainly to tip the posteriors vertically in order to create more room. Once there was space in her arches the blocked-out premolars erupted spontaneously and the teeth are being lined up with fixed braces and clear aligners (Figure 9, 10).

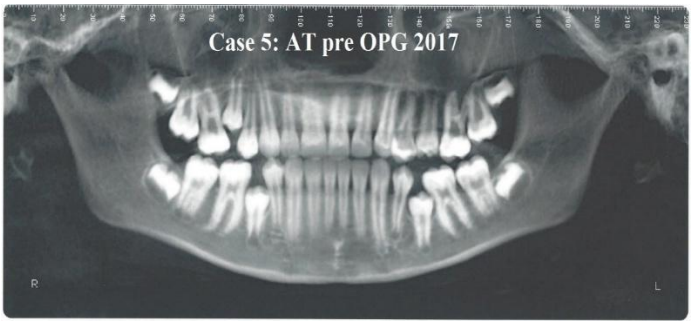

Figure 9: Case 5, AT pre OPG 2017.

Figure 10: Case 5, AT pre and post photos.

Case 6: Initials: JC, impacted mandibular second molar

This case was a 17-year-old that presented with crowding. He had an impacted tooth #47 which was quite deep. Treatment options considered were extraction or miniscrews to drag the tooth up. It was difficult to bond a bracket on the tooth #47. It was not possible to use the Bach technique because the wire could not go past the impacted tooth #47. A modification to the Bach technique was used with a 014 Niti threaded under the contact from the lingual to the buccal under local anaesthetic, and te ended of the wire are bonded on to the composite resin stop on tooth #46. There was enough clearance occlusally to clear the uprighting of tooth #47. The patient was monitored every 3 weeks for 3 months till the tooth #47 uprighted. The patient is still in fixed braces and tooth #47 will now be bracketed to align it (Figure 11).

Figure 11: Case 6, JC pre and post photos, pre and post x-rays.

Case 7: Initials: GD, impacted lower second molar

The patient was a 13-year-old patient who had impacted mandibular second molars. Several conservative methods were tried with a brass wire, disimpaction springs and the Bach technique. But the contact was very tight and it was decided to modify the Bach technique and loop a 014Nitiwire around the contact and bond it on the occlusal surface of the 46. She wore an Essix retainer for further anchorage and to avoid reciprocal effects of the spring. The second molars were disimpacted distally and finally settled into place (Figure 12).

Figure 12: Case 7, GD pre, progress and post photos, pre and progress x-rays.

Case 8: Initials: CA, impacted lower canine

This was a 10-year-old patient whose chief complaint was crowding in her teeth. Her lower mandibular left canine was blocked out buccally. It was decided to expand her jaws. A lower sagittal expansion was made for her and she was advised to only expand the left Jackscrew half a turn twice a week till there was place for the tooth #33 to erupt into place. The patient was finished with fixed braces (Figure 13,14).

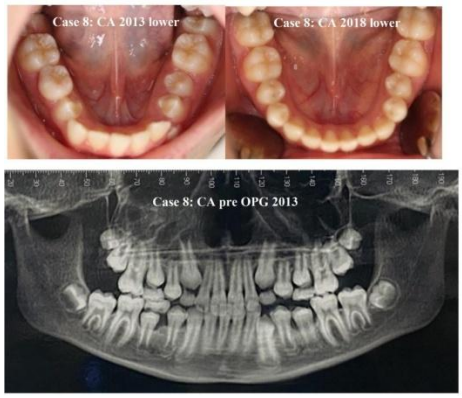

Figure 13: Case 8, CA pre and post photos, pre OPG 2013.

Figure 14: Case 8, CA sample of lower sagittal plate.

case 9: initials: bm, impacted second maxillary premolar

Literature is limited on the treatment of impacted premolars [18]. This case was a 11-year-old male with

a blocked out right maxillary second molar. The arch was expanded with expansion plates and when the space was created the second molar erupted spontaneously into the arch and was aligned with fixed braces. The molar band was debonded to create more room to align the tooth #15 (Figure 15-17).

Figure 15: Case 9, BM pre photo, pre opg 2013.

Figure 16: Case 9, BM pre and progress photos.

Figure 17: Case 9, BM progress and post photos, post OPG 2016.

Summary

It is very important for clinicians to assess patients for impacted teeth. Missing teeth, crowding or misaligned teeth may indicate the presence of an impacted or supernumerary tooth. The earlier the diagnosis is made of an impacted tooth the more beneficial it is to avoid increasingly complex effects of the impaction. 3D scans are invaluable in assessing any ankylosis, the position, complexity of the impacted tooth and its relation to adjacent teeth and structures. The cases demonstrate that if the dental arches are crowded and there is not enough space for the impacted or blocked out teeth, then every attempt should be made to make room for the impacted tooth by expansion if possible to encourage spontaneous eruption or with orthodontics and traction before considering extraction of adjacent teeth or the impacted tooth.

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