Acta Scientific Dental Sciences (ISSN: 2581-4893)

Volume 2 Issue 9 September 2018

Case Report

Management of Compound Odontoma and Missing Lateral Incisor by Interdisciplinary Approach: A Case Report

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Received: July 14, 2018; **Published:** August 22, 2018

Abstract

Odontomas are hamartomas rather than neoplasms as they are consisted of native tissues to the teeth such as enamel, dentin, cementum and pulp. Generally they are asymptomatic, common odontogenic lesions, which are mostly diagnosed after the second decade of life. Most of the time, Odontomas may leads to the impactions and delayed eruption of succedaneous teeth. Hence, apart from surgical treatment, orthodontic treatment is also the treatment of choice to correct the malocclusion.

A case of 25-year old female presented with the chief complaint of upper spacing with missing lateral incisor on upper right side and peg lateral on upper left side. Radiological evaluation revealed multiple teeth like radiopaque mass in relation to mandibular canine and premolar region. Histopathology revealed the structure to be compound odontoma. This case was managed by interdisciplinary approach that is surgical excision of calcifying structure and orthodontic treatment. In this case, canine was protracted in place of missing lateral incisor and reshaping was done to simulate it with the lateral incisor.

Patients with odontoma, missing lateral incisor and peg-shaped lateral tooth should be treated by interdisciplinary approach to obtain excellent results.

Keywords: Odontoma; Missing Lateral Incisor; Interdisciplinary Approach; Esthetic

Introduction

Odontomas (also termed odontome) are hamartomas rather than neoplasms as they are consisted of native tissues to the teeth such as enamel, dentin, cementum and pulp. It comprises of around 22% of all odontogenic tumors of the jawbones [1]. According to classification of odontogenic tumors (WHO, 2005), odontoma can be classified in to compound and complex type. It is compound type when it shows an anatomic resemblance to a normal tooth while it is said to be complex when it presents as an irregular mass with dentin and enamel formation but without any defined morphologic aspects. The compound type is more common in the anterior region of the maxilla, while the complex type is frequently found in the posterior region of the lower jaw [2,3].

However, despite of the literature report, complex odontoma may be located in the anterior region of maxilla [2]. Similarly, compound odontomas may be found in the region of mandibular primary cuspid [4].

Odontomas can also be classified in to central and peripheral type. It is called central odontoma when it is present inside the bone and peripheral odontoma when it is present in the soft tissue envelope of the tooth-bearing areas of the jaws [5].

The tumor is slow growing and radiographically seen as a radiopaque mass. Surgical excision is indicated with good prognosis and rare recurrence. Etiology of odontoma is unknown, however possible factor suggested are infection, local trauma and genetic characteristics [2,7].

Odontomas can also be associated as part of syndromes like Gorlin syndrome, Gardner syndrome, familial colonic adenomatosis, Tangier disease or Hermann syndrome. The differential diagnosis of odontoma are ameloblastic fibro-odontoma, ameloblastic fibroma and odontoameloblastoma [8].

The literature showed that odontoma is considered as an etiologic factor for dental retention [9,10]. Most frequently teeth impacted by odontomas are cuspid followed by upper central incisors and third molars [6].

Case Report

Diagnosis and Etiology

A 25 year old female patient was referred for orthodontic consultation. Her chief complaint was gap present in the front region of jaw. She had no relevant family history, no significant prenatal, postnatal and medical history and no history of parafunctional habits. She was very conscious of her gap present in between the teeth and smile (Figure 1).

On clinical examination, She had a straight profile with a symmetric face and competent lips. Intraoral examination revealed Class I molar relationship bilaterally, missing right lateral incisor, peg shaped lateral incisor on the left side of the upper arch and the gap between the teeth in the front. The both maxillary and mandibular arch were U-shaped and had spacing in the maxillary arch.

Figure 1: Pretreatment intraoral and extraoral photographs.

On cephalometric analysis, it showed skeletal Class I pattern (Figure 2) with an ANB angle of 1° and normal growth pattern, as shown by an FMA of 23° and SN-GoGn of 32°, proclined and normally placed maxillary incisor and nearly normally inclined and normally placed mandibular incisors. On soft tissue examination, lips were retrusive with no lip strain and obtuse nasolabial angle.

A panoramic radiograph showed the presence of small multiple radio-opaque teeth like mass in between 43 and 44. It also showed the absence of third molars in all the quadrants except upper left quadrant where third molar was present. The overall alveolar bone level was within normal limits (Figure 3).

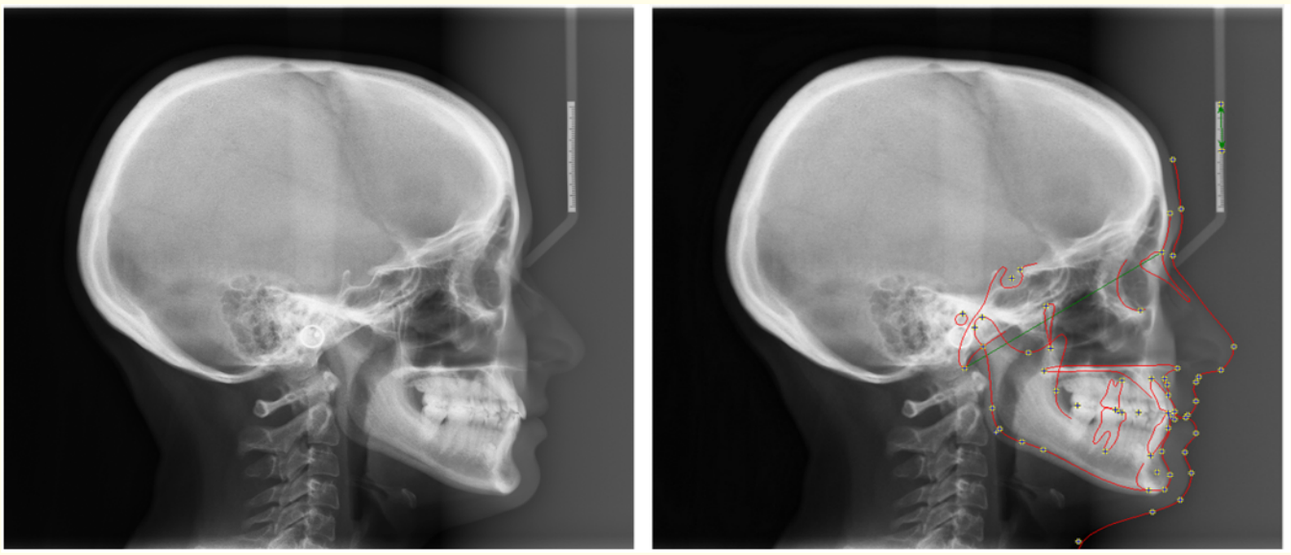

Figure 2: Pretreatment lateral cephalograms and tracing.

Figure 3: Pretreatment orthopantomogram.

Treatment Objectives

The treatment objectives were to remove odontoma present in the mandible, correct spacing, correction of proclined maxillary incisors, addressing to the missing right upper lateral incisor and to restore the peg shaped lateral incisor tooth to the normal shape and size.

Treatment plan

Patient had skeletal class I pattern and normal growth pattern hence corrective orthodontics was planned.

Treatment Progress

Both the maxillary and mandibular teeth were banded and bonded with fully programmed preadjusted 0.022 slot MBT pre-

scription brackets. The arches were aligned using the following sequence of archwires; 0.014" NiTi and 0.016"NiTi (Figure 4). Later, 0.018"ss wire followed by 0.019 x 0.025" ss wire was placed to level and express the prescription of the bracket.

As lateral incisor was missing on upper right quadrant so to eliminate the prosthesis, protraction of canine in the place of lateral and reshaping the canine to simulate with the lateral incisor was performed. For this canine bracket was inverted upside down

Figure 4: Mid treatment photographs.

Figure 5: Surgical excision of compound odontoma.

in later stage to simulate the torque of lateral incisor. Class III elastic was placed on right side for protraction of posterior teeth in right upper quadrant. Finishing and detailing was done and the appliance was debonded. Just before debonding, upper peg lateral incisors were restored with full ceramic crown to simulate with contralateral lateral incisor. The total treatment time was 15 months. In retention phase, fixed bonded retainers were placed in both the arches.

Tooth-like structures were carefully excised under local anesthesia, without disturbing the adjacent teeth (Figure 5). Specimens were then sent for histopathological examination which confirmed the diagnosis of compound odontoma.

Treatment results

The post treatment facial photographs showed a remarkable improvement in patient profile and facial esthetics. Facial balance

Figure 6: Post treatment extraoral and intraoral photographs.

and smile esthetics were improved. Lip support improved for both upper and lower lip (Figure 6).

Intraorally, an optimal overbite and overjet relationship was established. A well interdigitated buccal occlusion with Class I canine, Class I molar relationship on left side and Class II molar relationship on right side and normal overjet and overbite was achieved. There was canine guidance in lateral excursion with proper anterior guidance without balancing side interferences.

The posttreatment cephalometric radiograph (Figure 7) and superimposed tracings (Figure 8) showed changes in the dental and skeletal measurements after treatment.

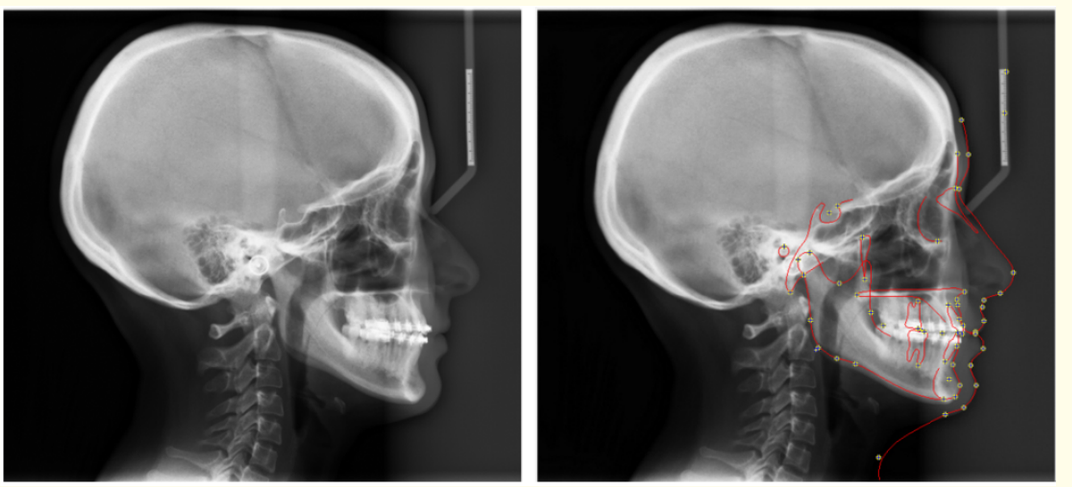

Figure 7: Post treatment cephalogram and tracing.

The posttreatment panoramic radiograph showed no evidence of odontoma with good bone support in relation to 43 and 44 (Figure 9).

The pretreatment and post treatment cephalometric parameters is compared in table 1.

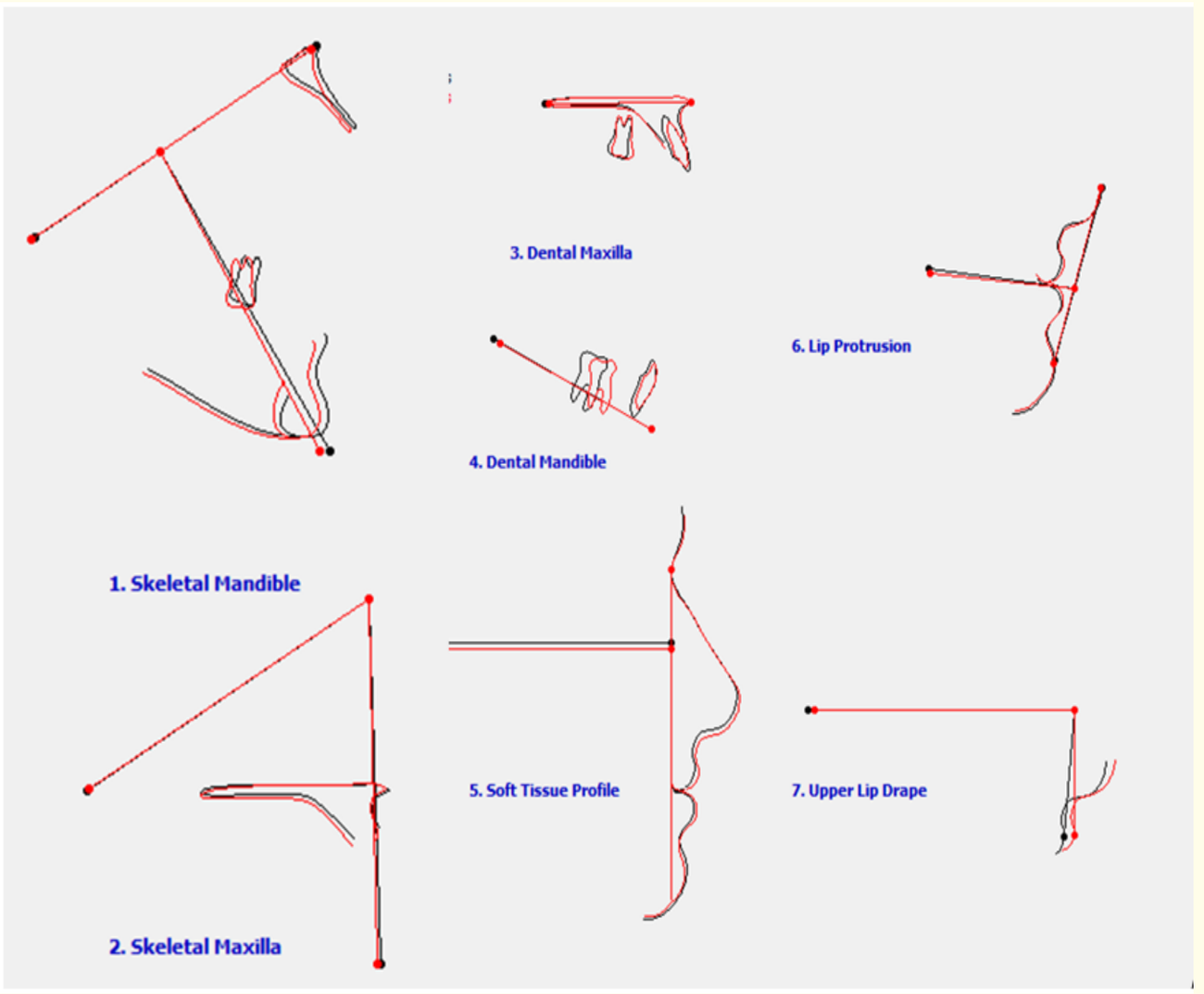

Figure 8: Superimposed tracing.

Cephalometric parameters	Clinical norms	Pre-treatment values	Post-treatment values
SNA	82 ± 2°	80°	80°
SNB	80 ± 2°	79°	79°
ANB	2 ± 2°	1°	1°
Wits	0-(-)1 mm	-2 mm	-2 mm
FMA	25 ± 2°	23°	23°
SN-GoGn	32 ± 2°	32°	32°
Max.I-NA	22 ± 2°	27°	24°
Man.I-NB	25 ± 2°	21°	21°
LI-A-Pog	2.7 ± 1.7 mm	1 mm	0 mm
IMPA	90 ± 2°	89°	90°
Interincisal angle	134°	130°	133°

Table 1: Comparative cephalometric parameters.

Figure 9: Post treatment orthopantomogram.

Discussion

Odontoma are common odontogenic lesion, usually asymptomatic and are mostly diagnosed after the second decade of life. Most commonly odontoma leads to impactions and delayed eruption of succedaneous teeth [11,12]. The treatment of odontoma is complete surgical excision with affiliated soft tissues, since it carries the risk of delayed eruption of permanent tooth, displacement of the adjacent teeth and give rise to dentigerous cysts [8]. As the dontomas are well encapsulated, they are easily enucleated from the surrounding bone tissue. Apart from surgical treatment, orthodontic treatment is mostly indicated to correct the malocclusion [5]. In this case complete surgical excision was performed for the management of odontoma.

For missing lateral incisor, there are two treatment approaches commonly taken are either creating adequate space to replace the missing lateral incisors or closing spaces and reshaping the canines to simulate the presence of lateral incisors. Spacing due to lateral incisor agenesis may be managed orthodontically with canine guidance or movement into the place of lateral incisors and subsequent mesial movement of posterior teeth. In such cases an Angle Class II occlusion is the only option. Selective grinding of canine incisal edges and canine and first premolar palatal cusps and tooth remodeling with composite resin are performed; canines and first premolars substitute for lateral incisors and canines, respectively, thus satisfying both esthetic appearance and good stomatognathic function of the patient [13-15]. Furthermore, it may be necessary to place a canine crown in order to simulate the size and shape of the lateral incisor [16]. In this case the canine was protracted in place of lateral and reshaping was performed to simulate it with lateral incisor.

Orthodontically, there are several treatment options for management of peg laterals. According to Counihan, there are two basic approaches [17]. First, the lateral incisor can be extracted followed by space closure but that will often give a narrow unaesthetic smile also the colour of canine is too yellow and too high gingival margin. The second option which is often preferred is to open the space on both sides of peg-lateral to create the space for a normal-sized lateral incisor followed by either restorative build up the peg-lateral or crown is placed to simulate a normal-sized lateral incisor.

Sometimes the gingivae will require crown lengthening surgery to create the correct crown heights- harmony with central incisor teeth. Orthodontic intervention often is required prior to the restorative treatment phase to address unfavorable spacing or occlusal issues and to optimize the position of the teeth [18,19].

The arrangement and proportion of maxillary anterior teeth are the major determinants for a pleasing appearance. To evaluate and describe the ideal tooth-to-tooth proportion, Levin applied the golden proportion (proportion of 1.618:1.0) to relate the successive widths of the anterior teeth as viewed from the front [20].

The golden proportion implies that the maxillary central incisor should be 62% wider than the lateral incisor, which is consistent between the widths of the maxillary lateral incisor and canines. However, Preston reported that only 17% of the patients had the golden proportion in terms of the relationship between the maxillary central and lateral incisors [21].

In addition, when using the golden proportion, the lateral incisors and canines appeared too narrow. Therefore, Ward indicated that the recurring esthetic dental (RED) proportion was more appropriate to individually fit the face, gender, and body type of each patient [22]. The average range of RED proportion from 62% to 80% was considered acceptable.

Based on "golden proportion" principle of esthetics, the space for the maxillary lateral incisor should be approximately two-thirds of the width of the central incisor [23]. However, if the patient is missing only one maxillary lateral incisor, then the space required is primarily dictated by the width of the contralateral incisor [22]. When both laterals are congenitally absent, the amount of space required for the implant restoration is occlusion and the proportional relationship between the central and lateral incisors [23].

In this case, as the size of the peg lateral is conical and small hence full ceramic crown was placed in peg lateral to simulate the shape, size and colour of the lateral incisor.

In the case discussed above, orthodontic treatment alone would not have given the smile the patient so much desired. Prosthetic treatment and surgical treatment alone would not have corrected the other problem. Hence multidisciplinary treatment approach were considered for satisfactory result.

Conclusion

Patients with odontoma, missing lateral incisor and peg-shaped lateral teeth should be prepared for the careful interdisciplinary treatment planning to obtain excellent results. This type of treatment can be efficiently and successfully carried out by carefully coordinating the appointments.

Combining orthodontic, surgical and prosthetic modalities of treatment produced a satisfactory result and the patient was very happy with her smile and occlusion.

Acknowledgement

I would like to thank Maxillofacial Surgeon Dr. Krishna K.C. for surgical treatment of this case, and the orthodontic patients who allowed me to publish their records.

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