COMPLEMENT YOUR TEETH THROUGH IMPACTED CUSPIDS

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ABSTRACT

A young patient consulted an Oral Surgeon who advised him surgical removal of both of his impacted cuspids. The patient and his father agreed to this treatment, as they were not told of any other conservative options. After seeking some orthodontic information they landed at this clinic where after thorough evaluation, an orthodontic preference was suggested to which they agreed.

It took almost 22 months to achieve the set goals. The treatment plan called for replacement of deciduous cuspids with the permanent canines, which were impacted. Cuspid guidance was gained. By adding the cuspids in question, a full complement of teeth was restored. He was smartened up with an inspiring and wide radiant smile.

INTRODUCTION

In Pakistan dental care awareness is gearing up at a very high speed. But even now many people are still ignorant of dentistry particularly specialized dentistry. Most of the time we come across cases that a poor patient is advised extraction of the prominent or blocked out cuspids. Some times cuspids are enucleated so as to avoid perspective orthodontics. At times patient is told to avoid orthodontics, as this will weaken the roots/foundation of the teeth. Patients are on record who have lost their cuspids along with all permanent incisors and have been replaced with fixed prosthesis using quick setting acrylic resin.

Orthodontists pay great respect to the cuspids. Occlusionist considers a balanced occlusion as incomplete without cuspids. Temporomandibular joint experts endorse these ideas. Cuspids are the cornerstone of dental arches. They are the teeth of function. They are the guiders of dentition, and last but not the least they are the teeth of esthetics and contribute exponentially in the build up of pleasing and an attractive smile.

Timely orthodontic approach to the impacted maxillary cuspids is the treatment of choice. Management of impacted canines needs expertise in the hands of a prudent orthodontist. Comprehensive orthodontic treatment of the involved teeth not only avoids the imminent resorptive tendency of these teeth, compromising the existence of the neighboring dental structures, but it also helps restore the balanced occlusion and a harmonized facial esthetics.

CASE HISTORY

A young male patient of age 14 reported to the orthodontic clinic of Armed Forces Institute of Dentistry (AFID), Rawalpindi on Aug 22nd, 2000 requesting for a second dental opinion. After clinical evaluation it was found that deciduous maxillary cuspids were in place, both of maxillary permanent cuspids were missing. Rests of the teeth were present in maxillary and mandibular arches. Maxillary laterals were a bit reduced in form but were not causing any significant visual distraction. They were acceptable to the patient. Radiographic examination revealed mesioangular palatal impaction of maxillary cuspids and presence of developing molars. Cephalometric analysis revealed

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Class-I skeletal relationship. Point "A" & point "B" spatial relationships were mildly compromised which secondarily affected the labial profile with reference to esthetic plane. Rests of the measurements were almost within normal limits. Orthodontic evaluation revealed following findings:

- Brachyfacial
- Competent lips with pretty lagging pattern from "E" plane.
- Symmetrical face
- Skeletal and dental Class-I
- Retained maxillary deciduous cuspids
- Full complement of teeth except impacted maxillary cuspids with mesioangular angulation and all 3rd molars, which were still in the eruptive phase of development
- All central lines were on
- Nothing else was remarkable except poor oral hygiene

The problem was discussed with the patient and his father in a detailed manner. All perspective queries were sorted out at the spot. Associated pros and cons of orthodontic mode of treatment were brought to the notice of the patient and parent. Idea of surgical removal was dropped by the patient which was earlier proposed by an Oral Surgeon.

ETIOLOGY

The most apparent cause of impaction in this case might be due to heredity. There was arch length discrepancy. Deciduous maxillary cuspids were still retained. Family history was, however not significant.

Maxillary canine impaction is complex in its etiology, localization, response to preventive treatment and prediction. Even now it is a big dilemma for many orthodontists. Evaluating whether impaction will occur and timing the treatment modalities that are affected by impacted cuspids are important for a fruitful outcome. If in these cases, orthodontic treatment is not initiated at an early age, ankylosis of the cuspids and deleterious effects on neighboring incisors roots are imminent.

There are many theories as to why canine impaction occurs, but they can be grouped into two classes: guidance and genetics. Bisharal et al. cited abnormal tooth bud eruption, abnormal eruption rate, and delayed resorption of primary teeth as possible guidance factors. As far as genetic component is concerned, Baccetti notes an association between canine impaction and other dental anomalies, while Peck et al. report that 33% of patients with impacted canines have other congenitally missing teeth. Gender could be another factor, because there seems to be twice as palatally impacted canines in females as compared to male counterparts. Jacoby discussed local factors such as arch length discrepancy as the most important cause of canine impaction. He found, however, that 85% of palatally impacted canines occur in patients with adequate arch length.

TREATMENT OBJECTIVES

Treatment objective for this patient included provision of an excellent oral hygiene status, intratreatment extraction of deciduous cuspids, creation of further space for the impacted cuspids, leveling and alignment of the impacted teeth in question and adding them to, so as to gain the complement of teeth. Rectifying the cuspids will help in gain of cuspid guidance, improvement in facial harmony in terms of a full attractive smile and mild labial lift which is already lagging behind esthetic plane. Special care should be taken that surgical approach to the cuspids in question should always be through the attached gingiva otherwise compromised periodontium would be definitely imminent.

TREATMENT ALTERNATIVES

If the patient management would have been difficult in terms of orthodontics, then it was obvious that the teeth in question would have been addressed through surgical means, particularly when they were damaging the neighboring structures.

Some times it is seen that these teeth are impacted and/or highly placed in palate after being fully matured. In this hibernated and quiescent situation, patient once explained, may decline the idea of orthodontics. Here he or she should be told to keep them under observation.
Had the teeth been totally missing then complement of dentitions would have been restored through the fixed restorative dentistry at the most appropriate age of the patient.

**TREATMENT PLAN**

The treatment plan called for preliminary leveling and alignment of dental arches. Following this, intratreatment extraction of deciduous cuspids was undertaken. This extraction space was not sufficient and was thus substantiated by further expansion of space between maxillary lateral and first premolar through coil springs. Now both of the cuspids were exposed through keratinized gingiva using cauteryization procedure. After bonding an attachment, they were actively engaged to the heavy base archwire. Tissue healing period was remarkable and no postoperative infection or inflammation of the bone was observed. No necrosis was noticed. Activation was undertaken at 4-6 weeks of interval. Once the teeth were brought into occlusion after fulfilling the demands of Andrews's six keys of occlusion, debonding and debanding procedures were operated and patient was placed on Hawley's retainers.

In most orthodontic techniques used to move impacted canines into the arch, the force usually comes from the labial archwire and is directed labially. However, when the canines are impacted high in the palate or when the tooth is horizontal with its crown close to the maxillary incisor roots, a labial pull could be damaging to the incisor roots. One approach to this problem applies a vertical pull on the lingual side of the arch to move the canine crown away from the lingual surface of the incisor roots, followed by labial traction to move the canine back into the arch.

**TREATMENT PROGRESS AND RESULTS**

All teeth were bonded using .022—in slot brackets. After ample display, buttons were attached to the palatal surfaces of the cuspids so as to apply couple forces during derotation and alignment procedure. Treatment continued until both of the cuspids in questions were properly brought into occlusion. Spatial care was taken to labially torque the root of the impacted cuspid, otherwise failure and relapse would likely be imminent. Healing of mucopriosteum and bone was remarkable. Principle of minimal intervention of dentistry was adapted. Traction forces applied were almost within physiological limits. Restoring the normal position of the impacted cuspids helped in achievement of cuspid guidance. It enhanced facial harmony particularly in terms of labial lift thus curtailing the lagging gravity of the lips with reference to "E" plane. A most pleasing and attractive look was obtained. As a result, tangible changes in dentofacial morphology were observed. Presently he is in retentive phase of treatment. So far no signs of relapse are observed.

**DISCUSSION**

Maxillary canine develops high, close to the eye and sinus, and buccal to the adjacent dental roots. It is evident from various studies that 85% of impacted canines are located palatally. Fournier et al reported a palatal-to-buccal impaction ratio of 3:1, while Jacoby reported a ratio 12:1. Irrespective of the causative factors, maxillary canine impaction occurs with high frequency to warrant comprehensive study of possible preventive treatment modalities. These days the most common preventive treatment for addressing this dilemma is to extract the primary canine with the hope that permanent canine resolves its unfavorable spatial relationship.

The two viable predictors of its final outcome are the mesiodistal location of the crown and the angulation of the tooth. Ericson and Kurug found that the more mesially located the crown, the less will be the possibility of eruption after the primary teeth extraction. Powers and short also focused on the angulations as a viable predictor and found that if the tooth is angled more than 31 degree to the midline; its chances of eruption after deciduous teeth extraction are curtailed.

The second treatment option is to wait till the permanent canine's impaction is certain to be imminent. Here surgical exposure is to be undertaken followed by bonding an attachment to the tooth and/or teeth in question. The success rates for either of the treatment modalities are quite optimal. It will be, however more optimistic to have the ability to foresee the maxillary canine impaction. Whenever patient is referred from a dentist with a dubious
perception, it would be admirable to have trustworthy means so as to evaluate the degree to which the tooth is destined to impaction. Some times early detection and prevention of impaction by deciduous extraction may decrease the patient's needs for surgical exposure and may avoid the protracted orthodontic treatment.14-16

In our view a dental deformity should be left as such unless it is causing a functional or physical problem.

CONCLUSION

The prime moment for orthodontic management of impacted and/ malposed maxillary cuspsids is prior to their encroachment upon the neighbouring dental structures, causing their damage in one way or the other. This damage in the form of roots resorption of the incisors can be greatly avoided if more prudent orthodontic approach is timely launched.

By saving the cuspsids from extraction, and adding them to the arches of dentitions, a most balanced functional occlusion and a harmonized facial esthetics will be the destiny of that patient. Longevity of the teeth, periodontium synchronized with the more physiological position of the TMJ should be the aim of an orthodontist.

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REFERENCES