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Original Research

Retreatment of an adult patient with impacted upper right canine: A rational multidisciplinary approach

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ABSTRACT:

Canine disimpaction is always a challenging task. The treatment of this clinical entity usually involves surgical exposure of the impacted tooth, followed by orthodontic traction to guide and align it into the dental arch. Although successful treatments are more frequent outcome, sometimes it is not possible to bring the canine into the dental arch. Inaccurate 3-dimensional diagnosis of location and orientation of impacted teeth and failure to appreciate anchorage demands are the major reasons for failure in the treatment of impacted canines. In this case report, an adult patient undergoing orthodontic treatment for 3 years reported with right lateral open bite due to faulty attempt of canine disimpaction. Even after using thorough refined treatment plan there was no movement of canine. Finally, the ankylosed canine was extracted, orthodontic treatment was done to correct the open bite and arch form and replaced with fixed prosthesis.

Key words: maxillary canine impaction, failed disimpaction, multidisciplinary approach

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INTRODUCTION

Tooth impaction has been defined as the in fraosseous position of a tooth after the expected time of eruption¹. Being the last tooth to be developed through the longest path of eruption, the maxillary canine has the highest incidence (range between 0.92-2.2%) of impaction after third molar². Canine impaction is more common in maxilla (mostly unilateral) and twice more frequent in females than males²⁻³. The etiology of impacted canine is believed to be multi factorial and having idiopathic origins including prolonged retention or early loss of deciduous canine, absence or anomaly of upper lateral incisors, local obstruction, pathology and genetic factor⁴. The treatment of impacted canines usually

involves surgical exposure and placement of attachment on the tooth followed by guided eruption into the dental arch through controlled orthodontic force application³. Although this procedure is often successful but it is not free of risks especially regarding orthodontic force application. Unplanned force application may have serious consequences like root resorption of the impacted tooth as well as adjacent teeth, unwanted movement of adjacent teeth causing anterior open bite, excessive mobility, periodontal destruction etc⁵⁻⁷. In this case report a 27 years old female patient who was under orthodontic treatment for three years at some other clinic, reported to us with a right lateral open bite due to faulty force application for bringing down a labially impacted

canine. The unesthetic appearance was hampering her psychosocial life to such an extent she had stopped smiling and interacting with people. With refined treatment plan the open bite was corrected but the impacted canine was found to be ankylosed and had to be extracted afterwards. With the help of fixed prosthesis satisfactory rehabilitation was done.

CASE REPORT

A 27 years old female patient reported with a chief complaint of large gap between upper and lower teeth in the right side (lateral open bite of > 10 mm). The patient was under orthodontic treatment for last three

years at some other clinic. On examination it was found that patient had mesoprosopic facial type with mild convex profile (Fig1). Intraoral examination showed the upper arch was partially bonded with Begg's brackets and a continuous round stainless steelwire was in place and being used to bring an impacted canine down (Fig 2). As a result, upper incisors and premolars got intruded considerably causing a large lateral open bite in the right side. The changes were evident when compared with the pretreatment study models as provided by the patient (Fig 3). The arch form of the maxillary arch was also completely lost.

Fig 1: Pretreatment extra oral photos



Fig 2: Pretreatment intraoral photos



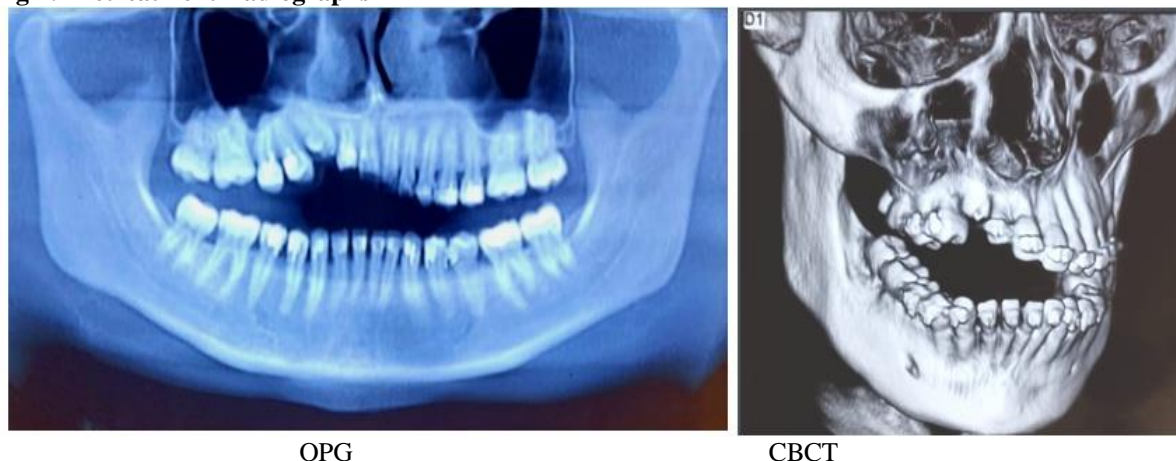
Radiographic examination revealed there was a labially impacted maxillary right canine (Fig 4). The adjacent lateral incisor also had suffered from considerable root resorption. The smile of the patient

had become so unesthetic that she became psychologically ill and stopped interacting with people.

Fig 3: Previous study models



Fig 4: Pretreatment Radiographs



TREATMENT OBJECTIVE

The objectives of the treatment were to correct the lateral open bite and provide a decent smile esthetics to the patient and bringing down the canine into the arch, if possible, otherwise prosthetic rehabilitation.

TREATMENT PLAN

The patient was planned to be treated with MBT technique and instead of using direct force very light indirect force was used to extrude the teeth to close the bite. Simultaneously Ballista spring was used to disimpact the canine. But as the treatment progressed the canine was found to be ankylosed and was eventually extracted. After completion of the

orthodontic treatment a four-unit fixed partial prosthesis was made.

TREATMENT PROGRESS

At first all the previous bonded appliances were removed (Fig 5). New MBT 0.22 slot brackets were placed along with removable TPA for molar rotation and crossbite correction as well as anchorage preparation (Fig 6). Considering the resorbing root of the right lateral incisor, at first it was not included in the continuous NiTi wire rather after reaching rigid rectangular arch wire it was gradually pulled down by piggy back fashion and later included in the arch wire. For disimpaction of the canine a Ballista spring was made (Fig 7) and attached with the impacted tooth.

Fig 5: After appliance removal



Fig 6: Initial wire and removable TPA



Fig 7: Ballista spring



But unfortunately, even after considerable time and refined planning there was no appreciable movement of the canine and it was found to be ankylosed. So eventually it was extracted. The orthodontic treatment was properly finished keeping adequate space for prosthetic rehabilitation of the missing canine (Fig 8). Finally, a four-unit PFM crown bridge was made including 14, 12 and 11 (Fig 9).

RESULT

At the end of the treatment proper alignment of the upper and lower teeth was achieved, left side molar cross bite was corrected and the unesthetic lateral open bite was closed. After the final prosthesis, proper smile esthetics was established which was quite satisfactory to the patient (Fig 9).

Fig 8: Mid treatment phase

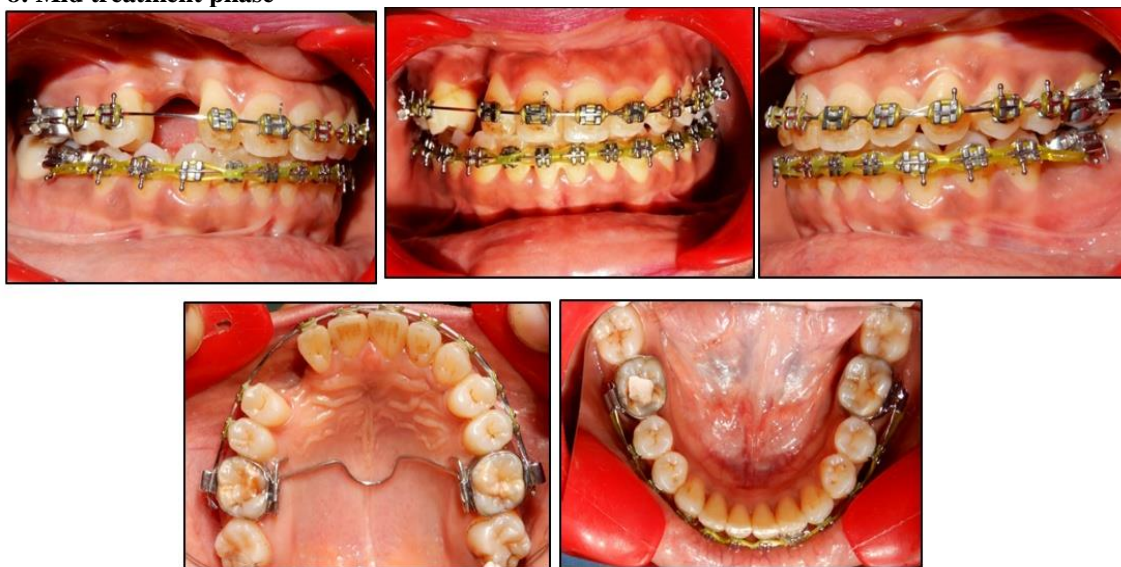
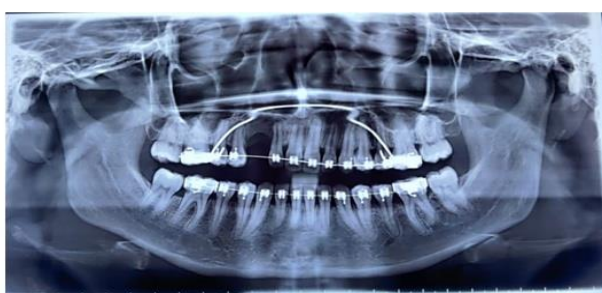


Fig 9: Post treatment photographs





Fig 10: Post treatment radiographs



OPG



Lateral cephalogram

DISCUSSION

The cause of failure to disimpact a canine is mainly due to three factors⁸

1. Patient-dependent factors: abnormal morphology of the impacted tooth, age, pathology of the impacted tooth, grossly ectopic tooth, resorption of the root of an adjacent tooth and lack of compliance (missed appointments, inadequate oral hygiene).
2. Orthodontist-dependent factors: wrong diagnosis and inappropriate directional force, missed diagnosis of resorption of the root of an adjacent tooth, poor anchorage, inefficient appliance, and inadequate torque.
3. Surgeon-dependent factors: mistaken positional diagnosis, exposure on the wrong side, or rummaging exposure; injury to the impacted tooth; injury to an adjacent tooth; soft-tissue damage; and surgery without orthodontic planning.

In this case the canine was found to be ankylosed, that's why even after application of force for considerable amount of time it did not move. The

pitfall for the previous treatment was not the lack of movement of canine but the application of force without considering the consequences. Lack of anchorage preparation and disimpaction in a continuous round wire were bound to cause the lateral open bite. The following treatment with TPA in place and application of force only after going to rigid wire stage prevented any unwanted side effect even when the tooth was ankylosed. Once a tooth becomes ankylosed it becomes virtually impossible to move it, so extraction was the choice. Special care was taken for right lateral incisor having poor root condition and instead of putting continuous arch wire from the beginning it was gradually pulled by piggy back arch wire. At the end of the orthodontic treatment a prosthetic bridge was made. Considering the status of the roots of the adjacent lateral incisor the bridge was planned to be extended up to central incisor. Implant was not considered because of the bone status (Fig 10). The end result was quite satisfactory (Fig 11) and not only esthetics but patient's psychological status was also improved considerably.

Fig 11: Pre & Post treatment comparison



CONCLUSION

The management of impacted canines is important in terms of esthetics and function. Clinicians must formulate treatment plans that are in the best interest of the patient and they must be knowledgeable about the variety of treatment options. Even if the canine disimpaction is unsuccessful, still patient can have a decent outcome with the help of interdisciplinary approaches.

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