Multidisciplinary Approach of Anterior Dental Esthetics: A Case presentation

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*Introduction

Bimaxillary dentoalveolar protrusion is one of the most prevalent malocclusion in Asian population [1]. However, for extremely severe cases, orthodontists seem to still have to face the limitation of orthodontic treatment and turn to surgeons for cooperation. In this case, we will see how dramatic changes happened on an adult patient with severe bimaxillary dentoalveolar protrusion malocclusion after the surgical and restorative treatment. In addition one of the most challenging problems in dentistry is the choice of treatment for correction of one or more maxillary incisors that have been malposed or lost as a result of traumatic injuries. The problem of restoring esthetics and function varies significantly according to the age of the patient, the location of the malposed teeth.

To produce an optimal treatment result, it frequently is necessary to use the combined effort of an multidisciplinary approach of expert dentist, representing oral surgery, periodontic, restorative dentistry and dental technology [9]. The skill of such a dentist sometimes can recreate the beauty and function of the natural dentition even in cases of severe maxillary protrusion and malposed teeth [10].

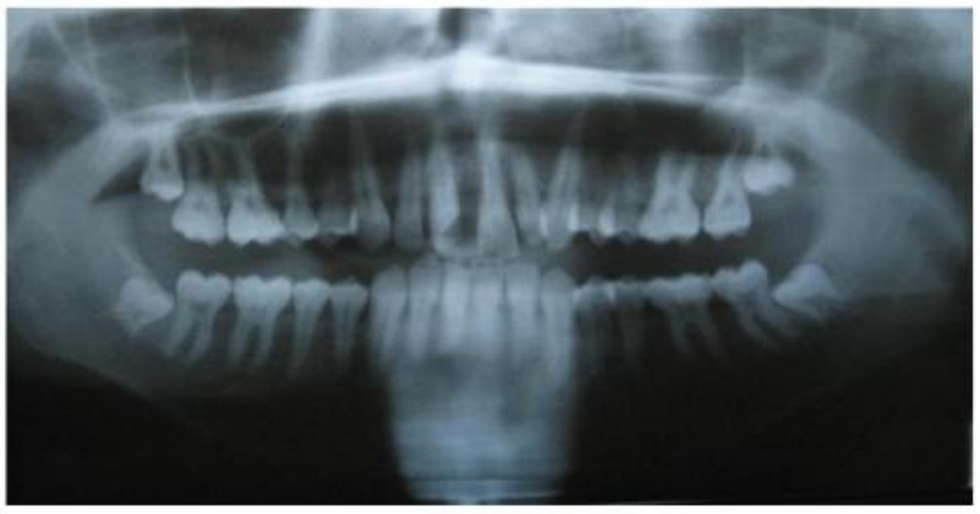
The case report included here describes the successful multidisciplinary treatment of a difficult maxillary protruded case with malposed maxillary left lateral and central incisors in a young boy **(Figure 1 and 2)**. The surgical, periodontal and restorative treatment of this case were carried out by one specialist, Dr. Kholani with the help of the dental assistant team.

Case report

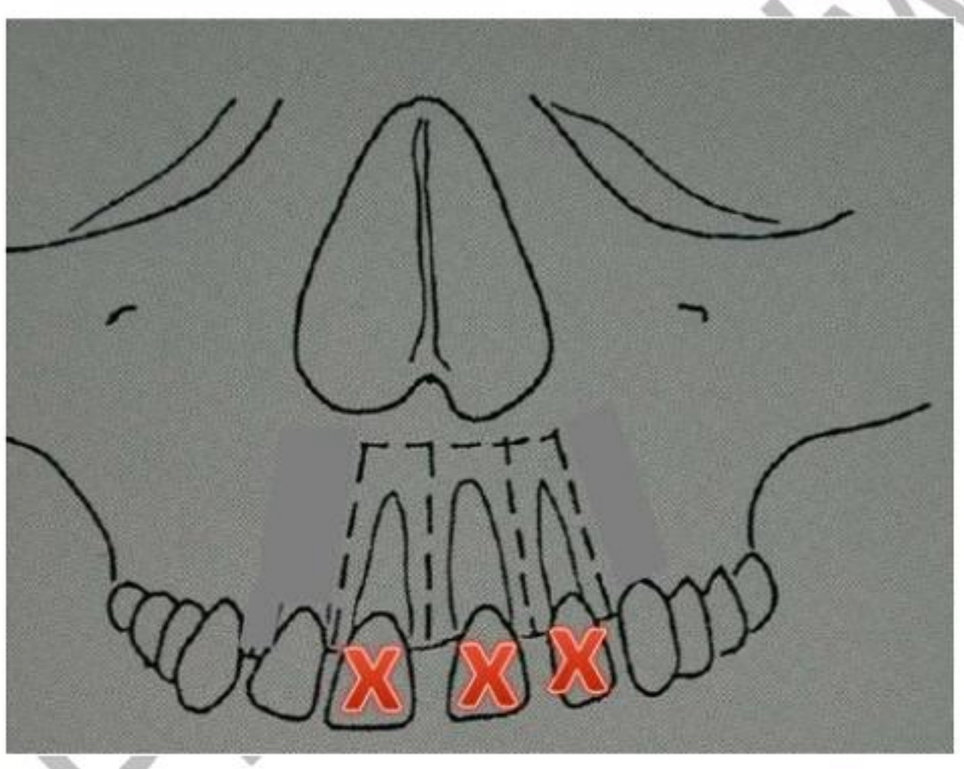
Initial patient presentation

(Figure 1)

(Figure 2)



(Figure 3)



(Figure 4)

An 18-years-old male patient presented with a malposed teeth Nos. 8, 9 and 10 (the maxillary central and left lateral incisors) and protruded maxilla (**Figures 1 and 2**). Radiographic examination revealed normal periapical areas around teeth Nos. 8, 9 and 10 (**Figure 3**). The patient requested cosmetic rehabilitation of the maxillary central and left lateral incisors teeth Nos. 8, 9 and 10, due to the mal-position of the teeth. Due to the young age of the patient and the high aesthetic demands, the treatment plan included a staged approach to teeth extraction, horizontal bone distraction, for anterior maxilla, bone augmentation followed by final restoration.

Diagnosis

- Malposed teeth Nos. 8, 9 and 10 (the maxillary central and left lateral incisors)
- Bilateral maxillary protrusion
- Gingival hyperplasia mainly in the lower jaw
- Fractured incisal edge of the lower right central incisor tooth No. 25
- High aesthetic demands with a high smile line
- Inadequate over jet and over bite

Treatment plan

- Taking preoperative photographs
- Fabrication of diagnostic casts, Trail preparation and wax patterns
- Preparation of maxillary right canine and lateral incisor with maxillary left canine and first premolar (i-e: teeth Nos 6, 7, 11 and 12) for use as abutment teeth for a fixed prosthesis

- Extraction of malposed teeth Nos. 8,9 and 10 (the maxillary central and left lateral incisors)
- Full thickness mucoperiosteal flap from cuspid to cuspid maxillary teeth
- Distraction of buccal aspects of the alveolus of teeth Nos. 8, 9 and 10 followed by smoothening and autogenous bone graft
- Reduce flap length (height), flap repositioning and interrupted suture
- Immediate placement of a provisional fixed partial denture for teeth Nos. 6-12
- Healing and soft tissue maturation period
- Composite restoration for mandibular tooth No.25
- Gingivectomy for mandibular anterior segment
- Placement of permanent restoration

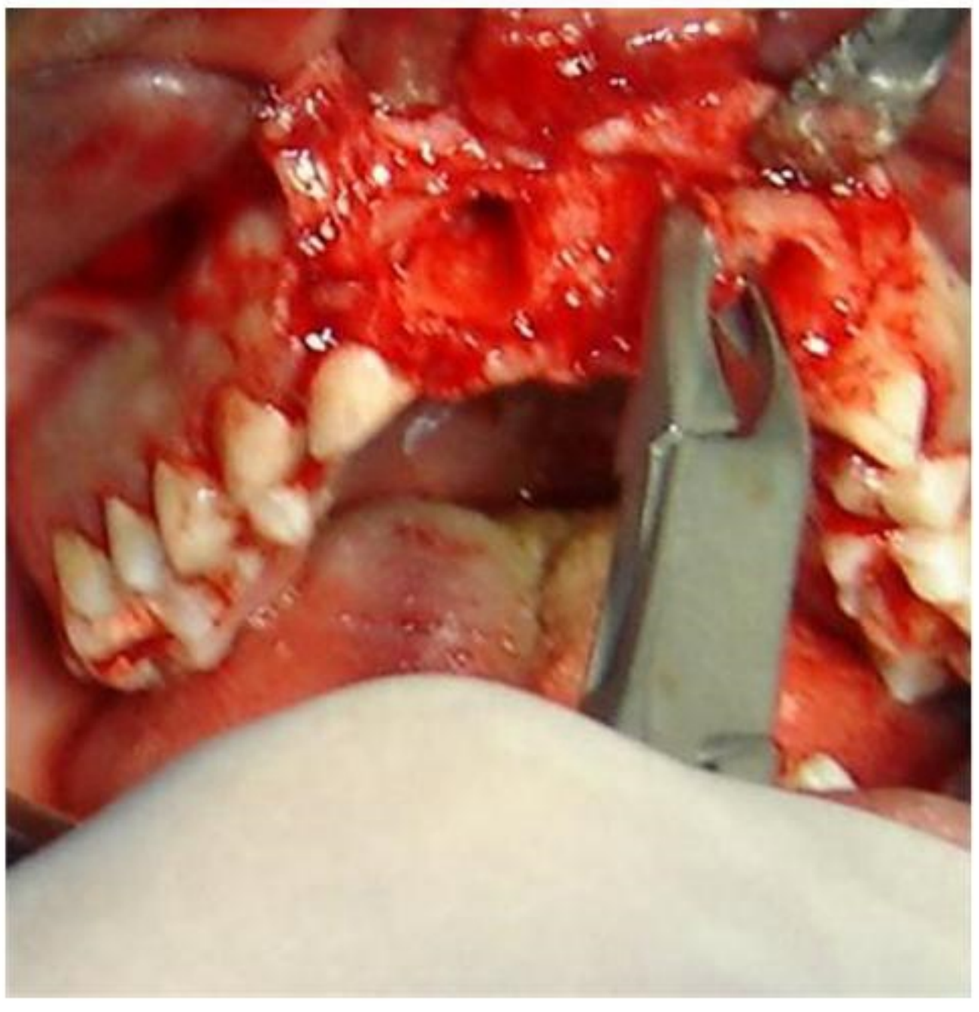
Surgical treatment

Following acceptance of the treatment plan by the patient, trial preparation and trial wax-ups were fabricated. On the day of surgery, the patient received local anesthesia by infiltration and the maxillary right lateral incisor, canines, and left first premolar teeth Nos. 6, 7, 11 and 12, were prepared to receive fixed porcelain fused to metal bridge. The malposed teeth Nos. 8, 9 and 10 were removed immediately after preparation of the abutments (**Figure 4**).

The socket walls were debrided using hand instruments (**Figure 6**).

(Figure 5)

(Figure 6)



(Figure 7)

(Figure 8)

(Figure 9)

A full thickness mucoperiosteal flap was elevated facially from cuspid to cuspid (**Figure 5**) to expose the bone. The integrity of the socket walls were evaluated and the facial part of bone of the extraction socket of teeth site Nos. 8, 9 and 10, were distracted and smoothed. The bone obtained from distracted site were grafted (autogenous bone graft) to the extraction sockets to reduce protrusion in the anterior maxilla (**Figure 8**). Excessive height of flap were excised and Interrupted sutures were placed to close the flap (**Figure 9**).

Provisionalization

Impression taken immediately after surgical operation and the provisional restoration was prepared in the laboratory and placed onto the prepared teeth Nos. 6, 7, 11 and 12 (**Figure 10**). The restoration had occlusal contacts in centric and eccentric positions. The patient was dismissed with postoperative medications and instructions.

(Figure 10)

Restorative treatment

Four weeks post surgical operation and grafting, the patient returned for evaluation. The provisional restoration was removed revealing excellent soft tissue healing around the pontics area and an adequate zone of attached gingiva (**Figure 11**). An impression was made with silicon impression material. An alginate impression was made of the opposing arch and sent to the dental laboratory, occlusal record and shade

selection for fabrication of porcelain fused to metal bridge (**Figure 12**).

(Figure 11)

(Figure 12)

(Figure 13)

Clinical overview

This clinical case presentation demonstrates a staged approach to tooth extraction and guided bone regeneration due to the young age of the patient and high aesthetic demands. Following tooth extraction, the osseous defect was grafted with (autogenous bone graft).

Excellent ridge width and soft tissue dimension was obtained, which provided for placement of the restoration in the aesthetic zone with optimal results (**Figure 11**).

Discussion

A combination of surgical interference and porcelain bridge may be the best alternative treatment option for bimaxillary protrusion with malposed one or more incisors in growing patients [11]. Any concomitant malocclusion can be treated at the same time, and the treatment outcome is permanent (**Figures 1 and 11**).

Esthetics has become a major component of modern dentistry. Orthodontics can be used to facilitate esthetic dentistry in many ways and it is also the most conservative treatment for remodeling the dental appearance and smile [12]. Most patients can benefit functionally and aesthetically from orthodontic therapy. However, especially adult patients may reject the orthodontic treatment due to style and place of living, socio-economic situation, occupational time limitation, appearance during treatment or esthetic and psychological concerns. The most reasonable and common method for

rehabilitating the problem of malposed teeth without orthodontic therapy is utilizing ceramic or metal ceramic bridge. The goals of therapy for the orthodontic and restorative dentistry are similar; how they achieve the results is the only difference [4].

All ceramic or porcelain fused to metal bridge are one of the most reasonable and aesthetic techniques that can be applied when restoring the dental arch for improved aesthetics [5]. Their fluorescence is an important physical property in order to mimic the natural tooth. Fluorescence adds to the vitality of a restoration and minimizes the metameric effect between teeth and restorative materials [6]. The use of ceramic bridge to solve esthetic and/or functional problems in the anterior section of the dental arch has been shown to be a convincing option. Years of experience with both the technique and the materials employed offer satisfactory, predictable and lasting results [7]. One of the major indications for using porcelain bridge is space management [8]. It becomes more of a challenge if the teeth are spaced or not properly aligned on the dental arch, especially in the case of malposed teeth.

In this case orthodontic treatment was offered to the patient but the suggestion was rejected. The patient had already bad oral hygiene, gingival bleeding, gingival hyperplasia and staining (**Figure 1**).

Conclusion

Ceramic bridge displayed promising results when considering the esthetic and mechanic criteria's. The new smile of the patient was satisfactory with excellent esthetic appearance **(Figure 13)**

References

1. Lamberton CM, Reichart PA, Triratananimit P. Bialveolar protusion as a pathologic problem in the Thai. Am J Orthod 1980; 77: 320-329.
2. Karlsson S. A clinical evaluation of fixed bridges, 10 years following insertion. J Oral Rehabil. 1986;13(5):423-32.
3. 17- Özcan M. Fracture reasons in ceramic-fused-to-metal restorations. J Oral Rehabil. 2003;30(3):265-9.
4. Kim J, Chu S, Gürel G, Cisneros G. Restorative space management: treatment planning and clinical considerations for insufficient space. *Pract Proced Aesthet Dent.* 2005;**17**:19–25.
5. Puri N, Pradhan KL, Chandna A, Sehgal V, Gupta R. Biometric study of tooth size in normal, crowded, and spaced permanent dentitions. *Am J Orthod Dentofacial Orthop.* 2007;**132**:7–14. doi: 10.1016/j.ajodo.2007.01.018.
6. Leinfelder KF. Porcelain Esthetics For The 21st Century. *J Am Dent Assoc.* 2000;**131**:47–51.
7. Fons-Font A, Solá-Ruíz MF, Granell-Ruíz M, Labaig-Rueda C, Martínez-González A. Choice of ceramic for use in treatments with porcelain laminate veneers. Med Oral Patol Oral Cir Bucal. 2006;11:297–302.
8. Spear FM. The esthetic correction of anterior dental mal-alignment conventional vs. instant

(restorative) orthodontics. J Calif Dent Assoc. 2004;32:133–141.
9. Chiche G, Kokich V, Caudill R. Diagnosis and treatment planning of esthetic problems. In: Pinault A, Chiche G, eds. Esthetics in fixed prosthodontics. Chicago: Quintessence; 1994.
10. Spear F, Kokich VG, Mathews D. An interdisciplinary case report. Esthet Interdisc Dent 2005;1(2):12–8.
11. Gillen RJ, Schwartz RS, Hilton TJ, Evans DB. An analysis of selected normative tooth proportions. Int J Prosthodont 1994;7:410–7.
12. Kokich VG, Spear F. Guidelines for treating the orthodontic-restorative patient. Semin Orthod Dentofacial Orthop 1999;3:3–20.

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