AN INTERDISCIPLINARY APPROACH FOR IMPROVED FUNCTIONAL AND ESTHETIC RESULTS IN AN ADULT PATIENT – CASE REPORT

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Abstract: In contemporary dental care an increased number of adult patients are seeking orthodontic treatment. In such adult patients, a combined orthodontic and other specialized therapy often offers the best options for achieving a predictable outcome to solve complex clinical problems. This case report demonstrates a combined therapy with orthodontic and implant-prosthodontic treatment in a 26 years old female patient with class II malocclusion, crowding in the maxillary anterior region, cuspid cross bite and loss of first upper premolar and lower first molar. The patient was treated with a straight-wire orthodontic appliance. Active orthodontic treatment was completed in 25 months and an implant supported prosthesis was placed with a single crown in the region of upper first right premolar. We demonstrate that combined orthodontic-implant-prosthodontic treatment can achieve an improved esthetics, occlusion and masticatory function.

Key words: adult orthodontics: interdisciplinary treatment.

INTRODUCTION

Dentofacial esthetics is of great concern in the adult population, with an increasing demand for orthodontic treatment in appearance-conscious adults. In this group of patients the primary motivating factor is a desire to improve their dental appearance. (6)

It is known that 30% of adult orthodontic patients require multidisciplinary management to attain optimal treatment outcomes. Functional and esthetic results may only be achieved with the combination of surgery, orthodontic and prosthetic rehabilitation.

In adults, closing an old extraction site with bone defects is likely to be a challenge for the orthodontist. (4)

CASE HISTORY

A 26 years old female patient presented for orthodontic treatment with crowding in the anterior maxillary region, labial position of the left upper lateral incisor, upper left canine cross bite, missing upper right first molar and lower left first molar. The patient chief complaint was to improve her dental esthetics because the teeth were crowded and gave canines. The upper first right molar was extracted more than 8 years ago, and the lower left first molar was extracted one year ago, consequent to endodontic treatment failure.

Pretreatment facial exam revealed mild facial asymmetry and a convex profile with normal naso-labial angle. The molar relationship cannot be established because of missing first molars, but the
canine relationship is class I on the right side and class II on the left side. The patient presented deep bite, 1, 5 mm mandibular deviation to the left side and crossbite on the upper left canine. Spaces were present in the maxilla distal to the upper first right premolar, distal to the second upper right premolar and mesial to the second right upper molar due to an old extraction of the upper first right molar; in the mandible there is a 9 mm space due to lower left first molar extraction (fig. 1).

The X-ray exam showed that the right upper first premolar had an old intra-radicular post which caused middle-third root fracture, so the dentist decided to extract the tooth. The upper right third molar is erupted in good position, the lower left third molar is in eruption, lower third right molar congenitally missing and lack of space for the eruption of upper left third molar which is locked behind the second upper molar. Cephalometric findings show a skeletal class II malocclusion (ANB 7°, but AO-BO distance +3 mm), with maxillary proclination (SNA 89°), mild mandibular proclination (SNB 83°), retroclined upper and lower incisors (UI with FH - 98°, IMPA 83°). FMA was 32° (fig. 2).

![Figure 1 (A to E). Patient B.C., intra-oral view pretreatment](image)

![Figure 2. Radiographic findings for patient B.C. before treatment](image)

**DIAGNOSIS, TREATMENT**

**OBJECTIVES AND TREATMENT PLANNING**

The patient was diagnosed with mild skeletal class II malocclusion, hyperdivergent pattern, good profile, retroclined upper and lower incisors, crowding in the maxillary arch with labial inclination of the left upper lateral incisor, lack of space for the upper left canine which is in crossbite with the lower left canine. On discussing the options the
patient expressed her concern only to solve the alignment problems and to restore the esthetic function as conservative as possible. The treatment objectives were: 1) to align the upper and lower teeth, 2) to keep and to resize the space for the upper right first premolar and for a premolar like tooth in the first lower molar place, 3) to create additional space for third molar eruption, 4) to create a functional occlusion, 5) to restore esthetics.

Considering the treatment objectives, the patient’s main concern, the previous extraction, and the asymmetric distribution of the third molars (3), we decided to extract only the upper second right premolar. We used a Gosgharian arch for medium anchorage in the maxilla and a .022 x .028 straight wire appliance. During the initial phase the maxillary appliance was placed from the upper right canine to the upper second molar and from the first upper left premolar to the upper left first molar in order to achieve the distal movement of the right upper canine and of the left first premolar. During the second phase, continuous archwires were placed in the maxillary and mandibular arches.

RESULTS

The post treatment intraoral photographs show a class I canine relationship with acceptable overjet and overbite (fig. 3). There is a 7.5 mm space distal to upper right canine which will be occupied by a ceramic crown on dental implant. Considering that esthetics was the main objective, a dental implant was placed in the first upper premolar place 3 months before debonding. After appliance removal, we placed a Hawley retention plate in the maxilla, with an acrylic tooth in order to keep the place for the upper right first premolar. In the mandible was placed a bonded retainer from right canine to left canine and a “U” shape bonded space maintainer in order to keep space for the next implant placement. Dental implant loading was performed 8 months later (fig. 4).

Radiographic exams reveal a good “camouflage” treatment for skeletal class II malocclusion, good alignment of the roots and dental implant placement (fig. 5). The patient continues to wear an Essex retainer after crown placement.

Figure 3 (A to E). Patient B.C., intraoral view, after orthodontic treatment
DISCUSSIONS

In the past three decades a major reorientation of orthodontic thinking has occurred regarding adult patients. Adult patients have many preexisting conditions that are not seen in the adolescent population, including tooth loss, periodontal disease and various forms of temporo-mandibular joint dysfunction (5). This is the reason for which the orthodontic treatment needs to be customized for the individual adult patient and to work cooperatively with a team of other specialists to give the patient the best outcome.

In this case, the treatment was focused mainly on achieving dental esthetics and function and not on solving the mild skeletal imbalance. As in most orthodontic treatments in adults (1), we found here some previous unfavorable conditions which directed us to a specific treatment plan. The main objectives of the orthodontic treatment, esthetics, function and stability could only be achieved only by means of an interdisciplinary collaboration. For a non-growing patient the treatment options are not the same as for a growing patient, because the treatment is focused mainly to dental compensation and to improving facial esthetics(2). In our case, the cephalometric analysis showed that the ANB angle remained the same after treatment (7°), so we still have a skeletal class II, but the Z angle improved from 60° to 65°, making a more harmonious profile. The pretreatment extractions made the treatment more difficult, because the extracted teeth, the first molars, were not the teeth to be chosen for orthodontic extraction in solving this type of malocclusion. More over, the patient refused to make other extractions, except the second upper left premolar for symmetry and alignment.

The case illustrates the fact that orthodontic treatment in adults may be different from the orthodontic treatment in teenagers with similar malocclusions (7). For non-growing patients there is almost always an interdisciplinary approach,
considering the need for periodontal care or prosthodontic restorations (8).

CONCLUSIONS
The orthodontic treatment in adults is influenced by the preexisting conditions and has to be individualized according to the patient’s main complaint. Interdisciplinary treatment combining orthodontics with surgery and prosthodontics helped to achieve good aesthetic and functional results in an adult case with multiple arch problems.

REFERENCES
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