Abstract

The demand for aesthetic treatment has particularly increased in today’s scenario with increasing awareness and information. The enhancement of the appearance and specifically smile has become the foremost concern amongst the patients seeking cosmetic corrections. In the present case report, we have discussed the correction of micro aesthetics in a 24 year old adult female by use of a clear aligner, with certain modification to suit the needs of the case. An interdisciplinary approach was used to address the aesthetic proportionality of the teeth and veneers were used for the same. The following case report highlights in brief the steps taken and showcases the quality improvement achieved in accordance with patient’s specific need and treatment plan combined.

Key words: Invisible aligners, interdisciplinary treatment, micro-aesthetics

Introduction

Patients today seek aesthetic treatment for enhancement of their appearance and for improving the quality of life. As a protocol in orthodontic diagnosis and treatment, aesthetic evaluation has been divided into three levels of assessment (Figure 1); macro aesthetics, which include the profile and vertical facial dimension, in other words the face; mini aesthetics, which include the smile attributes, buccal corridors, smile arc, incisor display, etc., and micro aesthetics, which comprises of the teeth and their many attributes, such as contacts and connectors, embrasures, gingival shape, and contour. Figure 2 presents a summary of the same.

Figure 1: Defining aesthetics into macro aesthetics (the face), mini aesthetics (the smile), and micro aesthetics (the teeth)

In cosmetic dentistry, orthodontics and orthognathic surgery, if the aesthetic outcome is not satisfactory to the patient, then they consider the case a failure. Orthodontists do not perform cosmetic dental procedures such as composite bonding, veneers, and crowns. However, with an interdisciplinary approach and application of the principals of


cosmetic dentistry, enhanced aesthetic outcome can be achieved. The present case report showcases the role of interdisciplinary treatment approach in achieving superior smile aesthetic result in a young female patient.

On intra oral examination, a good buccal occlusion with Angles class I molar and canine relation was present with an increased overjet (4.5mm). Mini aesthetic assessment showed spacing between the incisors and loss of proportion at the level of lateral incisors. Micro aesthetics were mostly favourable with symmetrical smile arch, appropriate incisor show, however, mild imbrications were present in the lower arch. Overbite evaluation indicated an increased vertical overlap, which can be addressed to improve the overall smile profile (Figure 4). On roentgenographic assessment using lateral cephalogram and orthopantomogram (OPG), a balanced skeletal proportion with fair to good dental alignment was noted.

Case history
A 24-year-old female patient, presented with the chief complaint of “front teeth gaps and an unpleasant smile” to the department of Orthodontics. The patient also mentioned and displayed extreme concern for the smile detail and a short term treatment approach in achieving the same.

On extra oral examination, good facial proportion, and balance with a pleasing profile was observed. The patient also presented with a mild deviated nasal septum, with no history of any functional disturbances or frequent sinusitis (Figure 3).

Treatment plan
On discussing the complete diagnostic parameter with the patient, the following treatment options were given: firstly, a fixed labial orthodontic treatment for levelling and alignment in the upper arch and imbrication correction in the lower arch. Secondly, a lingual orthodontic treatment with the same goals were also given.

However, the patient did not desire a fixed orthodontic therapy and expressed a desire for a more aesthetic and short term approach.

We offered the patient a clear aligner therapy within the limitations. The patient was also informed about the need for veneers on the lateral incisors bilaterally for restoration of smile proportion.

For the presence of deviated nasal septum, the patient was educated about the possibility of rhinoplasty, but due to the limited time, patient asked to defer with the plan.
Treatment progress and discussion

Step 1:
Recording of impression of the upper and lower arch using addition polysilicone impression material for improved accuracy.

Step 2:
Designing of the aligner: To address the increased over bite, a modification in the basic aligner design was done. The palatal aspect from the cervical third to the second rugae was blocked using plaster. This was done to form an anterior bite plane within the aligner. For close adaption to the maxillary incisors, labial reduction on the case was done by 0.5mm (Figure 5).

Step 3:
Fabrication of the aligner: The interdental spacing were blocked using wax and using a thermoplastic sheet of 1.5 mm thickness (SCHEU) the aligner was fabricated with positive pressure compression using Biostar pressure molding machine (Great lakes, orthodontic products, NY).

Step 4:
Mouth preparation: To facilitate the tipping tooth movement, clear composite buttons were placed on the labial surface of the incisors. This helps in two ways; firstly, improving the fit of the clear aligner and secondly by applying positive force, following a tight fit.

Step 5:
Reactivation: The patient followed up every 14 days and the adjustment of the aligner and the composite buttons was done to improve the stability and reactivated the tipping. On the second follow up appointment, another impression was recorded and the aligner was updated to adapt to the new tooth position.

Step 6:
Periodic Evaluation: The patient was instructed to wear the appliance continuously except when consuming food. The reactivation period continued for four weeks, following which space assessment of the veneer was done by the prosthodontist. During the period of veneer preparation, a new aligner without activation and buttons was delivered for retention.

Step 7:
Delivery of the veneers was done following a successful shade matching. Lastly, bonded lingual retainers were placed for the long term retention of the same. Post treatment evaluation showed improved overjet and overbite with a balanced smile and enhanced aesthetic profile (Figure 6). The use of clear aligners offers unique advantages, such as better aesthetics, comfort, simple mechanics and less chair side time. It also proves to be relatively not expensive. Clear aligners during the treatment continue to be aesthetic and adapted, as the appliance is frequently updated. The appliance can also be refabricated if it is lost or if it breaks during the treatment using the initial setup model. The micro aesthetic evaluation of this case showed a reduced tooth proportion, which could also be appreciated in the Bolton’s analysis with maxillary deficiency of 1.2mm in the anterior region. It was attended by careful space consideration during the treatment, followed by veneering of the lateral incisors bilaterally. The use of veneer lead to improvement in both the proportion and the overall shape of the tooth too. This led to a characteristic improvement in the smile of the patient. The use of removable clear aligner in the present case was based on the patient’s specific need and though with the basic limitations of a clear aesthetic aligner, the results have been obtained which can be well appreciated.

Conclusion
Interdisciplinary treatment has expanded to include not only soft tissue assessment of the periodontal
components of the dentition and smile, but of the face as well. The aesthetic enhancement includes facial proportionality as a key component in our patient evaluation with equal consideration to all the levels of the aesthetic assessment. The case presently discussed highlights the same and showcases a successful outcome with patients’ needs in mind.

References