When Esthetic Becomes Challenging

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ABSTRACT
This case report shows the successful change of a young lady smile, by following standard dental esthetic guidelines. With careful, detailed examination and diagnosis, we could reach our goal toward providing a high esthetic smile change.

Patient, dentist and dental technician communication is a must toward the best treatment results.

KEYWORDS

INTRODUCTION
Good appearance is considered literally a need, and dentistry has a fundamental role in obtaining it.¹ In the modern practice of dentistry, increasingly more patients are demanding a final appearance that is physiologically, mechanically and also esthetically pleasing.

Webster’s Dictionary defines esthetics as (emphasizing the evaluative criteria that are applied to art), “the branch of philosophy dealing with beauty and taste”. Since the mouth is a prominent line in the face and considered an exposed area of the body,¹ Esthetics in dentistry has increasingly become a major concern for the patients and often serves as a reason for seeking dental care.²

Dentofacial attractiveness is particularly important for the psychosocial well-being of an individual.² A non-harmonious smile reduces the beauty of the face and it will cause discomfort in the person’s social life. It is one of the most important facial expressions that demonstrate friendship, pleasant sensation and appreciation.³ Dentists must understand patient expectations; it is critical to develop a treatment plan that is esthetically pleasing and sound for the dental tissue.⁴

Several factors contribute to the composition of a pleasing smile, which include: clinical crown dimensions, midline position, and amount of gingival display, gingival architecture and tooth position.⁵⁻⁷

Esthetics is a primary consideration for patients seeking orthodontics, prosthodontics, and restorative treatment.⁷ This emphasized the need for an interdisciplinary approach (a combination of orthodontic, periodontic, restorative and prosthetic treatment) to evaluate, diagnose, and resolve esthetic problems.⁸

One of the components that enhance dental esthetics is the coincident midline. It serves both as an esthetic component and an important functional component of occlusion.⁹,¹⁰ It enhances esthetic especially when the maxillary central incisors midline coincides with the midline of the face.¹¹

To get an esthetic result and a smile that is in a harmony with function and health, dentists must understand and keep in mind the following principles:

Inter-pupillary Line:
The inter-pupillary line passes through the center of the eyes. If it is parallel to the horizontal plane, it is the most suitable reference for carrying out correct smile analysis.¹² It is often used as a reference to orient the incisal plane, occlusal plane and the gingival contours.¹³

Intercommissural Line (ICL):
The amount of maxillary tooth revealed below the ICL interacts with the viewer’s perception of the patient’s age. In a youthful smile, approximately 75% to 100% of the maxillary teeth would show below this line. This percentage will be reduced as the age of the patient advances.¹³

The Midline Line:
Midline is a crucial vertical reference line. It does not only locate the position of the facial midline but also determines the direction of the midline.

It is traced by joining the glabella, the tip of the nose, the philtrum and the tip of the chin.¹² Miller and coworkers stated that the dental midline coincides with the philtrum midline in only 70% of the cases.¹⁴
Furthermore, the results of several studies that attempted to determine the threshold of acceptability of dental midline deviation are conflicting.

Beyer et al.\textsuperscript{15} and Johnston et al.\textsuperscript{16} reported that the threshold for the public is 2mm, and Pinho,\textsuperscript{17} concluded that shifts of up to 4.0mm are not perceived by the public.

Smile Line:
The amount of tooth display is very critical. The smile line is the position of the inferior border of the upper lip at maximum smile. On the basis of the amount of show of the teeth and the gingiva, Tjan and Dong divided smile lines into low, average and high smile lines.\textsuperscript{18,19}

A pleasing smile can be defined as one that exposes the maxillary teeth completely, along with approximately 1 mm of gingival tissue. Gingival exposure that does not exceed 2mm to 3mm is nevertheless considered esthetically pleasing, while an excessive display (more than 3mm) is generally considered unattractive by most patients.\textsuperscript{20,21}

Size and Proportion:
The size of the maxillary central incisors was found to have an average width of 8.3mm to 9.3mm and an average length of 10.4mm to 11.2mm.\textsuperscript{22}

While tooth width generally remains constant, the length, in contrast, can change considerably with age. Almost all studies of tooth proportion have concluded that the width of a central incisor is roughly 80\% of the length within a certain variable range.\textsuperscript{13} Chiche and Pinault consider a proportion between 75\% and 80\% to be ideal.\textsuperscript{23}

Toward this end, the size and form of the maxillary anterior teeth are important not only to dental esthetics, but also to facial esthetics.

Many techniques could be done to help during a consultation for an esthetic rehabilitation treatment which include: Before-and-after photographs, diagnostic models with wax ups, composite resin mock-ups on the patient and computer-imaging simulations. The computer-imaging simulations offer the best idea to the patient regarding the treatment outcomes.\textsuperscript{12}

**CLINICAL CASE**
A 30 years old Asian female patient came to our office complaining of bad looking crown.

**Extra-oral examination:**
Findings were within normal limit.
The facial midline is not coinciding with the dental midline.

**Intra-oral examination:**
Patient had a defective crown on tooth number 21, with an exposed metal margin resulted in a gray band reflection on the marginal gingiva in relation to the same tooth (Figs 1-4).

The mesio-distal width of the crown does not match or even fall with the dimension of tooth number 11. (Fig. 5) Width to length ratio does not fall in to the acceptable esthetic requirements for the maxillary central incisors form and shape.
Tooth number 21 is over contoured distally and overlapped the mesial side of the tooth number 22, the pulpal diagnosis shows an adequate previously treated root canal with normal periapical status.

Teeth number 12 and 22 had defective composite restorations mesially (Fig. 4).

Dentolabial-smile analysis:
Maxillary teeth are following the inner curvature of lower lip (Fig. 1).

Upper interincisal line had about 2 mm deviation to the left side compared with facial midline (Fig. 2).

Midline canting existed (Fig. 3). Patient is having an average smile line. Occlusal plane is parallel to the commissural line.

Treatment completed as follow:
1. Smile design was performed on teeth number 11 and 21.
2. X-rays, primary impression and diagnostic wax-up were made.
3. Putty index and mockup were done.
4. Defective metal-ceramic crown was removed and temporary crown and veneer on teeth number 21, 11 were fabricated respectively using (Bisacryl Systemc&b II, Ivoclar) (Fig. 6).
5. Prefabricated fiber post (3M ESPE, Relyx fiber post) was cemented using Self-adhesive resin cement (3M ESPE, 56819 Relyx Unicem Resin Cement, A1 shade) (Figs 7-9).
6. Defective composite restorations were replaced on teeth number 12 and 22 using (3M ESPE Filtek Z350 XT). (Fig. 13)
7. Ceramic veneer were made on tooth number 11 with a finish line extended beyond the mesial contact area to be able to adjust the width of tooth number 21 using (Lithium disilicate glass-ceramic IPS e.max, Ivoclar) (Fig. 10).
8. Full ceramic crown on tooth number 21 using (Lithium disilicate glass-ceramic IPS e.max, Ivoclar) (Figs 11-12).
9. Cementation were done using (Variolink Esthetic LC Neutral, Ivoclar). (Fig. 13)
Each patient presents unique characteristics with respect to the patient’s facial and dental esthetics. Effective communication helps the dentist and the technician to achieve these characterizations for individual patients.

ACKNOWLEDGEMENT

Dr. Ahmed Shamiyah would like to acknowledge and appreciate Dr. Al Joharah S. Mezied, Second Year Prosthodontics Post Graduate Resident. REU, Riyadh, KSA.

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