International Journal Dental and Medical Sciences Research
Volume 2, Issue 6, pp: 136-139 www.ijdmsrjournal.com ISSN: 2582-6018

Smile design in dentistry-a review

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Date of Submission: 10-11-2020 Date of Acceptance: 24-11-2020

ABSTRACT:"A SMILE IS A FACELIFT THATS IN EVERYONES PRICE RANGE".Smile is what makes one's personality.A pleasant smile can make a person's day.Proper smile designing involves smile analysis which encompasses lip,teeth,gingiva and other facial features.A proper understanding and approach of different theories is required for effective smile designing.It is an interdisciplinary approach and this article clearly states the different parameters required in designing an effective smile.
KEY WORDS-smile design,esthetics,smile analysis,golden proportion

I. INTRODUCTION

Smile is a jewel that can be easily adorned by a person[1]and enhances the beauty of an individual.[2]A pleasing smile is what that acts as a means of communication between two individuals even if no words are spoken.[4]Smile design has important relevance in dentistry.The whole concept of dentistry involves function integrated with esthetics.[5]Esthetics is what matters most as it is the visible perception of an individual.[6]It has been said that beauty lies in the eyes of the beholder[7] so appearance is important[8] and so smile designing plays an important role in esthetic dentistry.[9]

II. REVIEW OF LITERATURE.

Francis G. Serio,Howard E.Strassler in their article periodontal and other soft tissue considerations in esthetic dentistry(1989)review a basic approach to soft tissue esthetics.According to them esthetics consideration plays an important role in treatment planning of dental care especially in the restoration of anterior teeth.So equal attention has to be given to shape of the face,position of the lips and the contours,colour and shape of the gingiva and associated soft tissues.[10]Daniel H.Ward (2007) in his study concluded that smiles created using the recurring esthetic dental principles were used by a majority of north American dentists.[11]Riyadh Al Habahbeh,Raghda Al-Shammout,Dr Osama Al Jabrah,Dr Farooq Al-Omari(2009) studied the effect of gender on the degree of display of ant teeth and gingiva during smiling and at rest.[12]Mohan Bhuvneshwaram (2010) outlined the various parameters that have to be taken into account during the art of smile designing.[5] Arvind Shenoy,Neena Shenoy Roopa Babannavar(2012) in their article have talked about the importance of periodontium in restorative treatment and sophisticated esthetic treatment for preservation of periodontium.[13]Edward A Mclaren, Lee culp discussed using computer design software as the main method of communication between the dentist and the ceramist being a useful tool for patients for showing them possibilities for enhancing their smile.[14]AnuradhaSharma,Reena Luthra,Palwinderkaur (2015) hypothesized that designing a smile based only on mechanical parameters will become monotonous whereas customizing it with patients behavior and attitude will make it more life-like.[15] Abdulrahman Alriqzi, YahiyaH. Mohammed and Roula Albounni (2015) conducted a literature review to highlight traditionally accepted smile design concepts with additional newer parameters incorporated in the esthetic treatment of the patients.[16]Fundademir , ElifAybala Oktay Fulya Toksy Topcu (2016) reviewed the relation between smile and dental esthetics together with teeth, gums. face elements and aesthetics criteria.[17]Emad A Al-Hazzinni, Majed D Al Dakheel, Mohammed SAldossary (2017) discussed about porcelain laminates being abut the most common tool to improve smile.[18]

III. SMILE ANALYSIS

Smile analysis involves multiple factors.Various parameters have to be taken into consideration for smile analysis.Broadly we can divide them into following:
1)Facial Analysis.
2)Dento Facial Analysis
3)Dento Labial Analysis
4)Dento Gingival analysis
5)Dental Analysis[19]

All factors are equally important.Description of the factors one by one is as follows:

FACIAL ANALYSIS
Facial analysis includes: -

International Journal Dental and Medical Sciences Research
Volume 2, Issue 6, pp: 136-139 www.ijdmsrjournal.com ISSN: 2582-6018

1. Facial height-The height of the face is divided into thirds from the forehead to the brow,from the brow to the base of the nose and from the base of the nose to the base of the chin.
2. Occlusal plane-The occlusal plane should be parallel to the interpupillary line.
3. Facial type-Face is divided into four types ie square,tapering,square-tapering and ovoid.
4. Facial Profile-Facial profile can be convex,concave or straight.
5. Rickets E plane-Aline is drawn from the nose to the chin and the distance of the upper and lower lip is measured from this plane.The upper lip should be 1-2 mm behind this plane and the lower lip should be 2-3 mm behind this plane.[5,7,20,]

DENTO FACIAL ANALYSIS

The dento facial analysis means analysis of the facial with respect to the dental midline.The facial midline is considered to be an imaginary line that bisects the forehead,the nose and the chin.The dental midline is an imaginary line that corresponds to the vertical contact between the two central incisors.Ideally dental midline should perfectly align with the dental midline.The best way to judge dental midline is the philtrum.It is the most consistent point.A slight mismatch between the dental and facial midline is usually not discernible.[21,22]

DENTO LABIAL ANALYSIS

Dentolabial analysis involves the relationship of the lips to the smile as the lips form the framework of the smile.Lips can be described based on its symmetry,width and fullness.An ideal smile design involves symmetrical lips.The left and right side of the lip should be mirror like in appearance.However, a little discrepancy is usually not perceptible.Width of the lips play an important role.A smile which is half the width of the face is considered to be esthetic.The fullness of the lips i.e. whether it is full,average or thin should be considered.The relationship of the upper and lower lip should be considered.The upper lip is usually large and it encompasses the lower lip.How much tooth material is visible during smile is also an important factor in smile designing.In males, usually less amount of tooth material is visible as compared to the females.Also, as age increases the visibility of upper teeth becomes less and more of lower arch is seen.This is because the lips drop down due to sagging of skin.Next to be considered is the lip line.The inferior border of the lower lip forms the lip line and it can be low,average or high depending upon how much of the gingiva is visible during smiling.A smile is considered to be esthetic when the lip line is average in which papilla and slight amount of interdental papilla is visible.There are cases when the lip line is high and there is excessive display of gingiva.In these cases, corrective measures have to be taken to achieve an esthetic smile.Corrective measures include orthodontic therapy,orthognathic procedures and periodontal procedures depending upon the diagnosis of the cause and assessment of the situation.Next is the smile zone which is formed by the inferior border of the upper lip and the superior border of the lower lip.There can be different shapes like regular,inverted, rectangular,bow shaped and elliptical.[23,24,25]

DENTO GINGIVAL ANALYSIS

Gingival architecture plays an important part in smile designing because they form the background of the smile.The healthy gingiva that fills the interdental region should be pale pink in color, stippled,firm and extending up to the contact point of the teeth.If this is not the situation then there will be unaesthetic black triangles in the interdental region which is considered unattractive.This situation is commonly seen when we are replacing missing anterior teeth and there is loss of inter dental papilla.Next feature to be considered is the horizontal line that connects the apical portion of the gingiva from cuspid to cuspid.The apical portion of the gingiva of the lateral incisor should be below this line.This type of smile is considered to be attractive since a straight line depicts more uniformity.The apical most portion of the gingiva of a particular tooth is considered its zenith point.In an ideal smile the zenith point of the central and canine are located distal to the long axis of the tooth while that of the lateral incisor is located along the long axis of the tooth.[21,22,27]

DENTAL ANALYSIS

Dental analysis involves the description of anterior teeth as it relates to smile.Anterior teeth are the most important part of smile analysis.The height and width of the central incisors play an important role as it is the base of the smile.The typical width to height ratio should be 4:5 or 80%.The placement of lateral incisors and canine is dependent on the correct placement and alignment of the central incisors.The correct proportion of tooth dimension can be decided upon by various measures as golden proportion,recurring esthetic dental proportion,M proportion and Chu's esthetic gauge.

The position of the contact point of the anterior teeth determine the apparent depth and width of the incisal embrasures.As we move posteriorly there is an upward shift of the contact point and hence the incisal embrasures become more wide and deep.This provides an illusion that the size of the teeth is increasing progressively.This is required for an ideal smile.Buccal corridor also provides for the width and depth of the smile.It is the space between the cheek and the buccal surface of the posterior teeth.A sufficient buccal corridor should be maintained so as to obtain a perfect smile.It should not be eliminated completely nor it should be excessive in depth and width otherwise we will not be able to visualize the posterior teeth.The sex,personality and age of the individual should also be taken into account when doing dental analysis as the characteristic features of central and lateral are dependent on it.

Apart from all these important features the other most important thing in smile design is the colour of the teeth.The colour is described based on hue,value and chroma.Hue is the dominant colour,value is the measure of the brightness or darkness and chroma is the saturation of the hue.The colour of the tooth is not uniform in all parts but it differs dependent upon the anatomical and structural differences.Mostly the patients prefer whiter teeth but shade selection should be done based on various factors and the patient should be counselled.[6,11,28,29,30,31,32,33]

IV. CONCLUSION

For a pleasing and attractive smile, various parameters are to be considered so that functional integration along with esthetic outcome is possible. Dentistry is an ever-changing science and recent advances like digital smile designing have been introduced to obtain a pleasing result.Smile designing is not an isolated area but involves multidisciplinary approach which involves various branches like operative dentistry, periodontics, orthodontia and orthognathic surgery. Recent advances in dental material science should also be taken into account as restoration with most advanced and esthetic materials will give a positive outcome. So, the goal for effective smile designing should be a composite evaluation and treatment planning.

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