Research Paper

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Anterior Teeth Selection in Edentulous Patients – An Esthetic Enigma

Medical Science

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ABSTRACT

Esthetics includes the appreciation and response to the beautiful in art and nature. The dentist must visualize esthetics in relation to the patient and then translate that visualization into an acceptable esthetic result. The success of his efforts depends upon his artistic ability, his powers of observation and his experience.
Herein this article we are discussing various techniques which have been used in selection of anterior teeth for edentulous patients.

Introduction
An acceptable cosmetic effect in any dental restoration has always been regarded as important to good dentistry. A well-made prosthesis will fail if it is deficient in this respect.[1]

Esthetics has been given many definitions in dentistry but according to Young. "It is apparent that beauty, harmony, naturalness and individuality are major qualities" of esthetics.[2] The selection of anterior teeth for an edentulous patient is a most important and often difficult problem for the dentist. He should select teeth which not only embody the proper form and size, but the most ideal shade as well.[3,4]

An attempt has been made to briefly elaborate the various methods advocated in the literature and to reach a practical method.

Review of Literature
I) Evolution of Techniques
Young in 1954 described the evolution of various techniques used in the selection of the anterior tooth mold.[5]

Technique 1
During the ivory age and early porcelain period, teeth were selected or created mostly by dimensional measurements of the denture space and arch size with little regard to esthetics.

Technique 2
The "temperamental technique" was the first technique of selecting tooth form from the point of view of influence and universal acceptance. It required several years to associate and establish dental characteristics of the temperaments and to incorporate them in manufactured tooth forms, this occurred by 1885.[6]

Technique 3
The "Typical form" concept projected by W.R. Hall in 1887. This was the initiation of the geometric theory later presented by Williams.

The basis of this classification was two-fold, the major basis was the tooth's labial surface curvatures (transverse and gingivo-incisal), outline form and neck width. Hall gave the classification of overall tapering and square.[7]

Technique 4
Berry's biometric ratio method – 1906. Berry's investigated the correlation between face form and tooth form and resulted in the discovery that the maxillary central incisor was $1/16^{th}$ the width of the face and $1/20^{th}$ its length. Difficulty in practical applications discouraged the use of this technique.[8]

Mavroskoufis et al in 1981 concluded that the inter-alar nasal width is a reliable guide for selecting the mold of anterior teeth. The authors advocate that the tips of the canine be set on a line which passes through the posterior border of the incisive papilla which proved to be a stable anatomic land mark.[9,10]

The incisive papilla can also be used as a guide for arranging the labial surface of the central incisors at 10mm anterior to the posterior border of the papilla.

Technique 5
"Clapp's tabular dimension table method" – 1910.

Teeth were selected based on the overall dimension of six anterior teeth arranged on the Bonwill circle and the vertical tooth space available in the patient.[2]

Technique 6
Valderrama's "Molar tooth Basis" was projected in 1913. This method of only historical value used varying measurements between combinations of cusp points to indicate the size of the individual and overall tooth measurements. The basic problem with this technique is that edentulous patients have no molars.

Technique 7
Cigrande 1913 advocated the use of the outline form of the fingernail to select the outline form of the upper central incisor. The size was modified to meet the requirements of tooth space and other relationships.

Technique 8
The Geometric method or Law of Harmony.

William's "Typal form method" projected by J. Leon Williams in 1914 is based on the geometric pattern created by the outline form of the bony face frame – the ovoid, square and tapering forms. William arrived at this classification after extensive anthropological study and was able to interest a manufacturer. This method is probably still the way in which most dentists select anterior artificial teeth.[3]

Technique 9
"Maxillary Arch outline form" projected by Nelson in 1920. This technique assumed that the arch outline form was a valid method since it was related to an individual's anatomy. This was invalidated by changes in arch form due to resorption.

Technique 10
"Wright's Photometric method" proposed in 1936 was based on using a photograph of the patient with natural teeth and establishing a ratio by comparative computation of measurements of like areas of the face and photograph.

Technique 11
"The multiple choice method" introduced by Myerson in 1937 was based on a need for a selective range in labial surface characteristic of transparent labial and mesial surfaces, varying surface colour tone, and characterization of teeth by time and wear.

Technique 12
"Anthropometric – Cephalic index method" projected by Sears in 1941 was based on the fact that the width of the upper central

incisor could be determined by dividing either the transverse circumference of the head by 13 or the bizygomatic width by 3.3. Tooth length was in proportion to face length.[11]

Technique 13
"Bioform technique" proposed by the Dentist's Supply company in 1950 is based on the geometric outline forms of face and teeth – the "House" classification for 4 basic and 3 combination typal forms, and 3-dimensional harmony of tooth form and face form. It is associated with the tabular and mold guide systems and is currently in use.

Technique 14
The "Trubyte tooth indicator" or "Selection Indicator Instrument" method advocated by the Dentist's supply company which is correlated with William's and House's Typal form theory and the Tabular technique.[4]

Technique 15
"House instrumental method" of projecting typal outline and profile silhouettes onto the face by means of a telescopic projector instrument and silhouette form plates. This was correlated with designated mold numbers and size variation. This was proposed by House in 1939 and by the Dentist's Supply Company in 1950.

Technique 16
"Automatic instant selector guide" of the Austenal company in 1951 correlated form, size and appearance in such a manner that only a single reading was required to select the appropriate tooth mold based on dimensions of denture space and harmony of face and tooth form.

Then in September 1955 Frush and Fisher created a revolution in the field of dental esthetics by the introduction of Dentogenics. In a series of six articles published between 1955 and 1959 they described various means to more natural dentures and many tips on how to avoid the 'denture look'.[12]

Krajicek in 1956 proposed methods involving the duplication of the patient's natural teeth either before or after extraction. Klein (1960), Hayward (1968), Kafandaris and Theodoros (1974) suggested incorporating the patient's natural teeth in the denture.[13-15]

Dentogenics
Frush and Fisher in 1955 gave Dentogenic concept. It means the art, practice and techniques used to achieve that esthetic goal in dentistry.

Frush and Fisher in 1956 advocated sex identity in dentures by the application of "Dentogenics". According to them, the feminine form is characteristically spherical with roundness, smoothness and softness that is typical of women. Whereas the masculine form is cuboidal, with the hard, muscular, vigorous appearance.[16]

The other aspect of Dentogenics what they discussed was – the personality of a patient. They devised the personality spectrum and explained the precise prosthodontic application of teeth selection on the basis of personality of the patient – like delicate, medium pleasing and vigorous.[17]

The age factor in dentogenics, considered by Frush and Fisher in 1957, determines the selection of the shade of the mold to be used in the denture. Light shades are considered appropriate for young people and darker shades are considered esthetic for older people. Mold refinement is done by producing worn incisal edges and cuspid tips, attritional and abrasion facets, development of diastema to indicate tooth loss and subsequent drifting. Thus the dignity of advancing age may be portrayed in the denture. [18]

In 1958, Frush and Fisher propounded the Dynesthetic interpretation of the dentogenic concept. The prefix 'dyn' is from the Greek word 'dynamis' meaning power. The dynesthetic techniques are rules which concern the 3 important divisions of denture fabrication - the tooth, its position and its matrix (visible denture base).[19]

The Golden Proportion
Of particular interest is the so called Golden proportion that exists between the perceived widths of the upper anterior teeth.

Lombardi in 1973 and Levin in 1978 demonstrated that the width of the central incisor is in golden proportion to the width of the lateral incisor. The width of the lateral incisor to the width of the canine is also in golden proportion as is the width of the canine to the first premolar. The golden proportion exists when the ratio between a larger parts 'B' (for example) to a smaller part 'A' (for example) is 1.618.[20]

Conclusion
The selection of anterior teeth is an important part of the esthetic phase of denture fabrication. It is essential not to be embroiled by the various techniques aimed at making the task easier. What is necessary is the development of an esthetic sense by the observation of natural dentitions in response as well as in function so as to be able to create dentures that are living things – belonging to a human being and not just mere artifacts that are poor replicas of what has been lost.

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