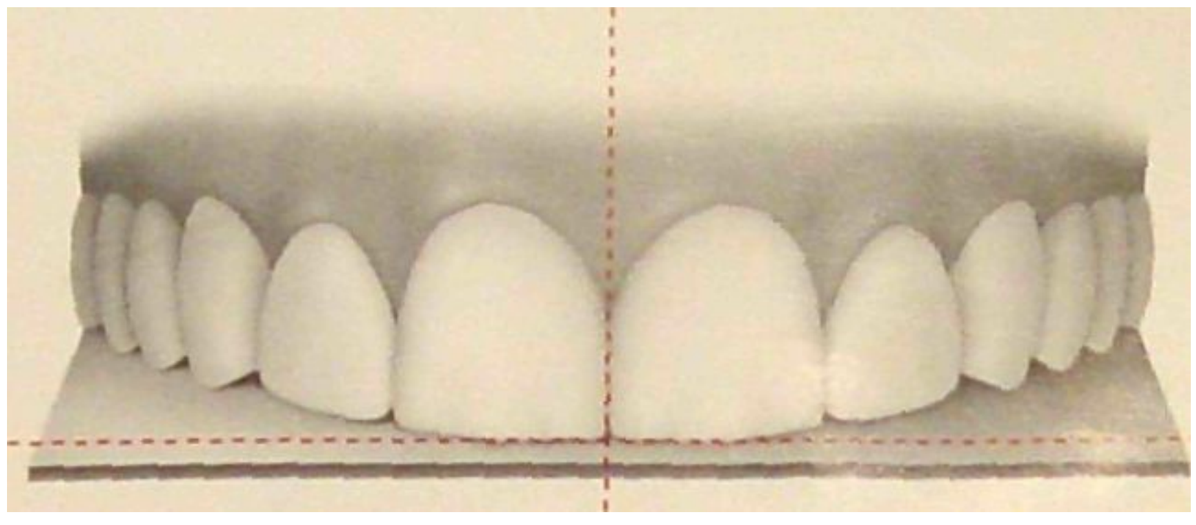
DIAGNOSIS AND TREATMENT EVALUATION IN COSMETIC DENTISTRY



A Guide to Accreditation Criteria

AMERICAN ACADEMY OF COSMETIC DENTISTRY*

DIAGNOSIS AND TREATMENT EVALUATION IN COSMETIC DENTISTRY

A Guide to Accreditation Criteria

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TABLE OF CONTENTS

page

Introduction

What is AACD Accreditationf
Accreditation Examination Criteria.....»
Educational format of this manual.....°
Photographic format of this manual.....*.....'
Criteria illustrated with direct resin cases.....,.....8-28
Criteria illustrated with indirect cases.....30-43
Criteria illustrated with bridge cases.....*.....•....44-52

General

7. *Smile Line*
Are incfsal edges in harmony with the smile line?
If not, is it because facial asymmetry requires
a different approach?.....8, 9, 12, 13, 33, 36, 49, 58

2. Midline

3. *Axial Inclination*
Is ihe axial inclination appropriate?.....,.....,11, 13, 30, 44, 48, 51, 52

4. Buccal Corridor
Is Ihe buccal corridor properly developed?.....,.....31, 32, 33, 44, 58

Specific

IncisalEmbrasures
Are Lhe incisal embrasures proper? Is there a natural
progressive increase in the incisa! embrasure size
from the central to the canine?.....14,15, 20, 26, 35, 45, 50

2. *Principles of Golden* ***Proportion & Central Dominance***
Are the principles of golden proportion and
central dominance appropriately used?.....16f 17, 33, 44

3. Symmetry
Is the cervical/incisal tooth length
symmetrical from right to left?.....17, 44, 46, 49
Is the interproximal contact or connector proper
in length and position?.....p.....20, 26, 50, 52
Are contra-lateral teeth properly arranged for size and position?.....26, 44, 48, 49

4. Incisal Edge Position, Emergence Profile, Labial Contour?
Is the emergence profile natural?.....18, 20, 24, 39, 42
Are there three planes for the labial contour?.....15, 34, 35, 38, 42

page

Periodontal Related Issues

1. Cervical Embrasures

Are the cervical embrasures proper? No dark triangles....*.....37, 38, 39, 40

\% ihere exposed tooth structure in the cervical embrasures
that compromise the case?....._.....37, 39, 41 43

Z Margin Placement and Design

Are the margins visible?.....41 F 43, 52, 54

Is margin placement and design appropriate?.....41, 42, 43, 52, 54

3, *Periodonlal Health*

Is the periodontal health optima!?.....17, 19 ,20, 24, 40r 42, 43, 49, 50, 52, 57

4. *Gingival Contour and Shape*

Is the gingival architecture appropriate tin all views)
and in harmony with smile design?.....12, 15, 17, 24r 40, 44, 45, 46, 47,46, 51

Should gingival recontouring, shaping, and/or
augmentation have been done?..J2, 15,17, 24, 40, 44, 45, 46, 47, 48. 49, 50, 51

Was an ovate pontic used for the bridge case?_____.44, 45, 48, 49, 50, 51, 52

Materials and Finish

7. *Choice and Use of Materials*

Does the restoration have "show through' of tooth
structure under the material?..... .25,26,43,54

Has the underlying tooth color been property
managed to allow for an optimal cosmetic result?™ .25, 26, 43, 54

Is the choice of luting material appropriate?..... .....-43, 54

2, *Labial Anatomy*

Is the labial anatomy appropriate?.....„..... 22, 23, 24, 40T 42

3, Surface Finish

Is the surface polish and texture appropriate?..... 25, 50

4, *Shade Selection*

Are effects of internal and surface color
characterization appropriate?..... -.....25, 26, 27

Is the color (hue, value, chroma)
selection appropriate, natural,
not monochromatic?.....25, 26, 27, 28, 30, 38, 40, 49, 52, 54, 58

Is incisal translucency and halo effect appropriate?.....25, 26, 27, 30, 40

CASE SELECTION

page

*Is case selection appropriate to achieve an optimal result m all views?** , 56, *57*

Is the choice of technique and

Have both function and cosmetics been considered in the choice of treatment?.....«.....43

Are occlusal forces properly addressed and in harrnonyt.....20, 39, 55

In the occlusal view, is the incisal edge position appropriate and is there a definite incisal edge?.....„„.....21, 22

The above-mentioned, suggested sequence of questions is made to facilitate evaluation in an organized, consistent manner. Be cognizant that some criteria (such as color, periodontal health *and* others) can and should be assessed in most, if not all, views.

Obviously, even though evaluation of case selection, diagnosis *and* treatment planning can be made by the examiners after reviewing all views these subjects must be considered by the operator prior to the onset of treatment.

Photography - the most common errors..... 58

Miscellaneous - Excessive moisture 39, 59

ACKNOWLEDGEMENTS

This guide is made possible by the vision and support of the Board of Governors of the American Academy of Cosmetic Dentistry*. The Board of Governors would like to thank Dr. Nathan Blitz, Chair of the Ad Hoc Criteria Committee, in particular, for the innumerable hours and effort he spent in creating this important new criteria guide-They also wish to thank Dr. Chip Steel and Dr. Corky Willhite for collaborating with Dr. Blitz in making this guide possible.

We would also like to thank Dr. George Olsen, DΓ Elizabeth Bakeman and Dr. John Boyd for their contributions of the superior clinical casework in this manual.

The beautiful drawings were provided by David Mazierski, a medical illustrator whose skill and patience were most appreciated.

We also wish to acknowledge the AACD executive staff for their support during the completion of this project.

INTRODUCTION

What *is AACD* Accreditation?

In 1934, the American Academy *of* Cosmetic Dentistry* was formed by a group of forward thinking individuals, dedicated to continuing education *in* the rapidly evolving fields of denial materials and cosmetic dentistry. Within a short period of time, the AACD developed a credentialing process for cosmetic denlisiry, designated "Accreditation/As the techniques and materials of cosmetic dentistry have developed, the Accreditation exam has continued to set a *standard for c\'\nlca* excellence. Successfully achieving Accredited status from the AACD requires dedication to continuing education, strict adherence to the protocol and a resolve to produce exceptional dentistry. This guide will help define examination criteria of Accreditation.

Accreditation Examination Criteria

Specific types of clinical cases, covering a variety of treatment modalities, are required for (he Accreditation exam. The cases are presented in both a written and oral format, and documented with a series of slides as defined by the AACD Guide to Dental Photography, The written format involves submitting, for anonymous examination, the "Clinical Case Reports" which includes all required slides. Specific Accreditation criteria are used by AACD examiners to evaluate clinical results. Only those candidates whose work (Clinical Case Reports) seems to satisfy the Accreditation criteria will advance to the oral format portion of the evaluation process. As criteria are influenced by advances in dental technology and procedures, it is imperative that Accreditation candidates utilize Current guidelines when evaluating cases to be used for Accreditation. A list of exam criteria and Accreditation protocol are available through the AACD Executive office and must be followed explicitly.

Educational Format of this Manual

This guide is organized in such a way as to present case studies (before and after treatment) from various examination categories showing proper clinical results, contrasted with photos of cases exhibiting areas of deficiency- Note that the views of each successful sample case represent a condensed versfon of that required for Accreditation. It is possible that the selected, properly treated, sample cases will exhibit minor concerns, but nonetheless provide an overall excellent result. In cosmetic dentistry, some flaws may be so insignificant that they are not detrimental to the overall quality of the case. Others can range in severity from minor to major to catastrophic. Hie contrasting examples of improper treatment were chosen to illustrate various deficiencies according to the exam criteria. In addition, each of the contrasting examples may exhibit more than one deficient area. Only the most significant criteria issues will be described. Hopefully this comparative approach will help define the clinical outcomes required to achieve Accreditation from the AACD.

This guide is an educational tool only, and is designed to help Accreditation candidates evaluate their clinical results. Because the photographs and diagrams utilized in this guide are limited to describing specific criteria, it should not be used to imply an expectation of success or failure based on comparison to a candidate's actual presentation cases.

Selected Accreditation criteria will be demonstrated using some of the required clinical coses.

Following these cases will be a section on general criteria points including case selection, appropriate photography and miscellaneous issues. Any factor that makes proper evaluation of the case difficult or even impossible (poor photography, surface moisture, etc} will have a negative impact upon the case *and,* depending on severity, may be cause for failure by itself. Case selection is often critical. In general, cases should be selected which provide the candidate an opportunity to achieve an excellent result without esthetic or functional compromises.

The primary purpose of this guide is to help dentists enhance their ability to visualize and critique cases using the AACD examination criteria.

A GUIDE TO ACCREDITATION CRITERIA

General

1. Smile Line
2. Midline
3. Axial Inclination
4. Buccal Corridor

Specific

1, Incisal Embrasures
2, Principles of Proportion
3. Incisal Edge Position Emergence profile, labial contour)
4. Cervical Embrasures

Periodontal related issues

. Symmetry
2. Margin Placement and Design
3. Gingival Contour and Shape
4. Periodontal Health

Materials and Finish

1. Choice of Materials
2. Labial Anatomy
3. Surface Finish
4. Shade Selection

Case Selection

1. Photography - the most common errors
2. Miscellaneous

PHOTOGRAPHIC FORMAT OF THIS MANUAL

In each section, before and after photos are presented of a case exhibiting superior results. This case is followed via selected views from the AACD Guide to Dental Photography to illustrate specific criteria. Each "after" view is contrasted with another case, which demonstrates areas of clinical deficiency.*n*

Full face views have been excluded. Photographs are oriented in **a** consistent manner to aid in case comparison.

Introduction

SMILE LINE

Are incite! edges in harmony with the smile
*tfnot, is it because facial asymmetry requires a different approach^*

Smile line ffifl. *)) refers* to on imaginary *Une a\on&* the incisal edges of ihe maxillary anterior *leelh* which should mrmic the curvature of ihe *superior* border *oi* the lower lip while smiling*. Another frame of reference for the smile line suggests that the centrals should appear slightly longer or at the very least not any shorter than the canines along the incisal plane. This approach *\s* particularly useful in cases *of* lip asymmetry or extreme lip curvature during smile formation.

Reverse smile tine - or inverse smile line occurs when the centrals appear shorter than the canines along the incisal plane,

Ljp line, not to be confused with the smile line, refers to the position of the inferior border of the upper Up during smile formation and thereby determines the display of tooth or gingiva' at this hard and soft tissue interface. The lip line is generally considered acceptable within a range of 2mm. apical or coronal *io* ihe height of gingiva of the maxillary centrals. Under ideal conditions the gingival margin and the lip *Une* should be congruent or there can be a 1-2mm. display at gingival tissue[1]. Showing 3-4mm. or more of gingiva often requires cosmetic periodontal recontouring to achieve an ideal result. A lip line is considered low if there is absolutely *no* gingival tissue visible during smile formation. Conversely a lip line is considered high if gingival tissue is readily displayed while smiling.

The smile line together with esthetics, phonetics and function helps determine:

/. The incisal edge position and

2. Influences tooth length of the maxillary centrals.

Incisal length that is ideal for the maxillary centrals traditionally has been influenced by **the smile line** and **incisal display,** as well as .one or a combination of the following methods.

J. Central length is made to approximate 1/16 of facial length, A commercially available "Tooth Indicator* facilitates such a conversion'. 5ome practitioners consider \/ a good starting point. However this method has been challenged *as* not being biologically valid'.

2. Central width determines central length according lo an ideal width to length ratio of 4:5 or O.S to 1.0, Generally the acceptable range for the width of the centrals is 75% - 80% of their length.

3. Convention accepts as pleasing a range of 10-11mm for the length of the maxillary centrals.

4. The centrals are most likely too long if they cause lower lip impingement, dimpling or entrapment during the formation of the *"f* sound.

5. Evaluation of the incisal plane to the occlusal plane in the lateral view can be useful. The centrals are most likely too short if their incisal surface is above the occlusal plane and they may be too long if their incisal surface is below the occlusal plane.

Most authors* recommend creating harmony & balance by eye* via evaluation and alteration of provisional rather than mathematical formulae.

If the centrals are too short they may be lengthened at the gingival or the incisal. In cases of a low lip line, where the gingival tissue is never displayed, the results of periodontal crown lengthening may not be visible at rest or during smile formation. An exception to this observation are patients who are not pleased with their dental appearance and therefore smile in a manner that hides their dentition.

Incisal display (preferred term) or tooth show. The amount of tooth displayed when the lips are parted and relaxed, determines if short centrals require lengthening at the gingival or the incisal. The amount of incisal display is then assessed. With the lips at rest in an ideal situation, 2-4mm. of the incisors should be visible. If the actual display is considered adequate then short centrals should be lengthened at the gingival as long as the lip line is high enough To expose this area during smile formation. Lengthening such cases at the incisal would result in excessive tooth show. It the display at the incisal is insufficient then these teeth should be lengthened at the incisal. Proper occlusal, periodontal and functional assessments must be made prior to determining if crown lengthening al either the incisal or gingival is appropriate and can be successful.

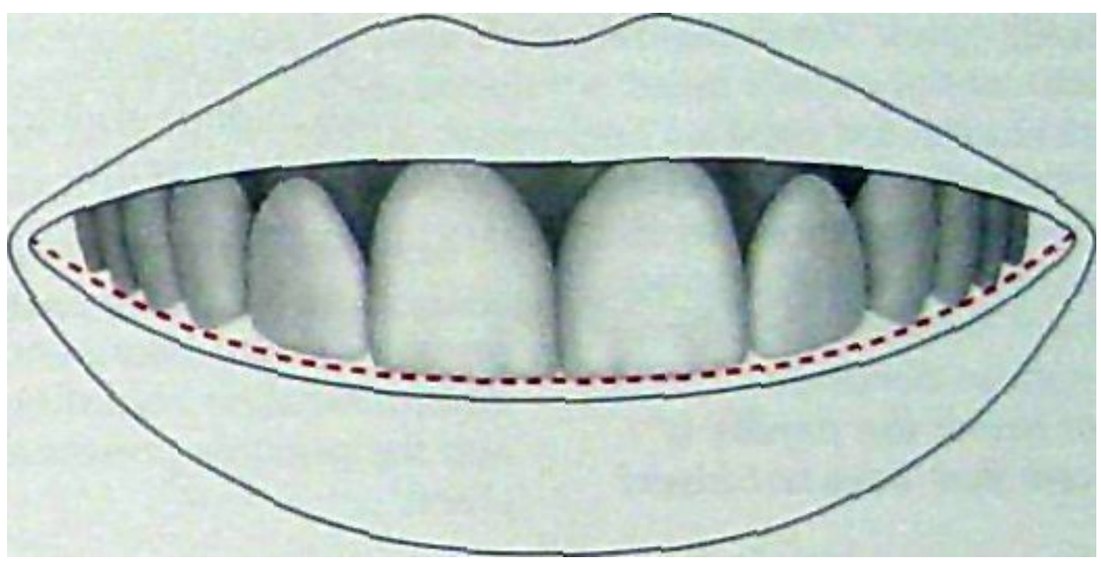
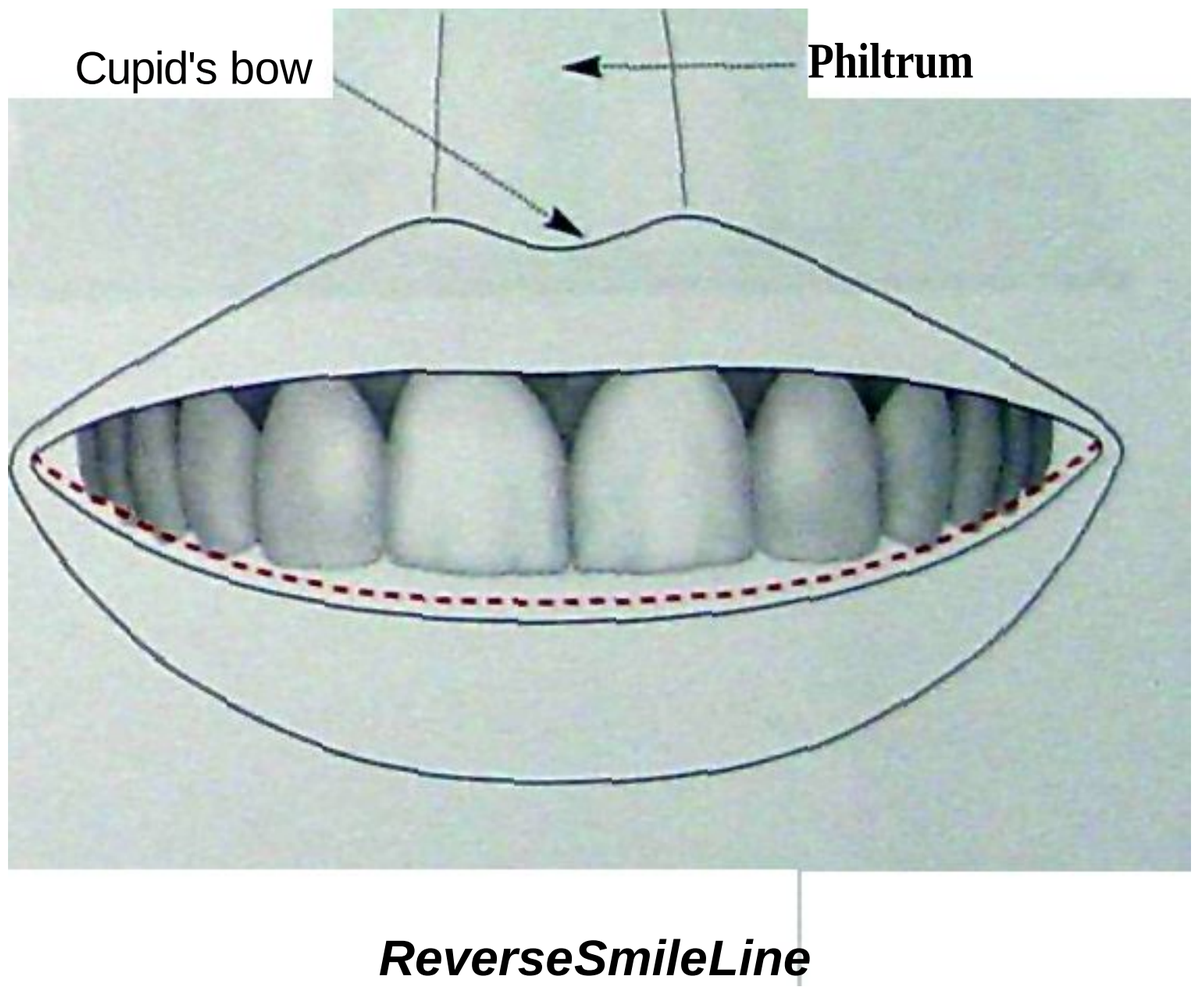


***Fig. ***
SmileLine



ReverseSmileLine

MIDLINE

h the midline correct?

The midline refers to the vertical contact interface between two maxillary centrals. It should be *ing.* 3) perpendicular *to* the incisal plane and *parallel* to the midline of the *face*[1]*.* Minor dfscrepanciei between facial and dental midlines <ire acceptable and *w* many instances not noticeable[7]. However a canted midline would be more obvious[5] and therefore less acceptable. Various anatomical landmarks (midline *of* the nose, forehead, chin, philtrum, interpupfllary plane) can be used as guides to midline assessments.

The philtrum of the lip is one *of* the most accurate *of* these anatomical guideposts. It *is* always in the center *of* the face except *in* surgical, accident, or *c\eh* cases. The center of the philtrum is the center of the cupid's bow (see fig. 2) and it should match the papilla between the maxillary centrals. If these two structures match and the midline is incorrect then *the* problem is usually incisal inclination. If the papilla and philirum do not match then the problem is a true midline deviation A midline (hat docs not bisect the papilla is* more noticeable than one that does not *bisect* the philtrum.

To evaluate the midline *one* must always consider":

1. Location
2. Alignment

Midline should be:

a/ Rami hi to the long axis of the face.

The line angle that forms the contact between the centrals should be parallel lo the long axis off the face,

b/ Perpendicular to the incisal plane.

The line angle that forms the contact between the centrals should be perpendicular to the incisal plane.

c/ Over the papilla.

The midline should drop straight down from the papilla.

A face bow transfer or even a reference stick aligned parallel *to* the interpupillarv plane provides useful information in laboratory communication regarding midline inclination, and the possible presence of a canted incisal plane.

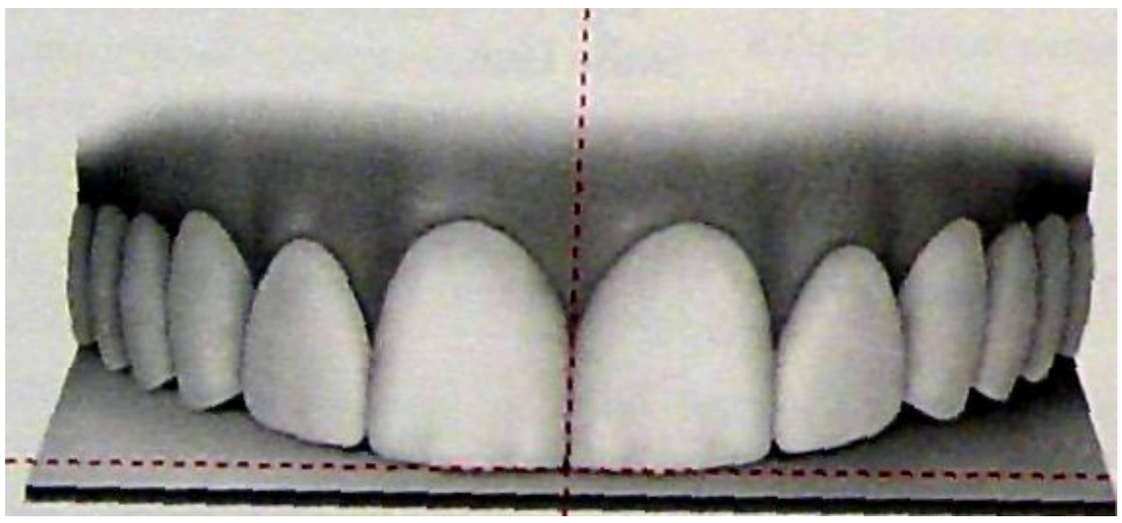


Fig.3
Midline

AXIAL INCLINATION

Is *the axial inclination appropriate?*

Axial inclination compares the vertical alignment of maxillary teeth, visible in the smile line, to the central vertical midline. From the central to the canine ihere should be *a* natural, progressive increase in the mesial inclination of each subsequent anterior tooth. It should be least noticeable with the centrals and more pronounced with the laterals and slightly more so with the canines.
If the incisal plane is canted, the axial inclination of the anterior teeth and the midline ilself, if it is at right angle to the incisal plane, will be correspondingly incorrect.

The evaluation of axial inclination (Fig. 4) can be done on a photograph of the anterior teeth in a frontal view. A line is sketched on each tooth from the middle of the incisal edge through the middle of the tooth at its gingival interface.
Note that the middle of the tooth at the gingival does not always coincide with the gingival zenith. The gingival zenith relates to the most apical point in the height ot gingiva at the tooth and soft tissue interface, usually on the facial aspect.
The gingival zeniths of the maxillary' laterals and the four mandibular incisors most oflen correspond to the midline through these teeth. The gingival zenith of the maxillary centrals and canines should be to the distal of the midline through these teeth. The axial inclination is determined by pitch bul it is also influenced by other factors such as gingival shape, gingival zenith, and contour which can create an optical illusion and modify the perceived degree of inclination of any tooth.

Axial inclination can also refer to the degree of tipping in any plane of reference.

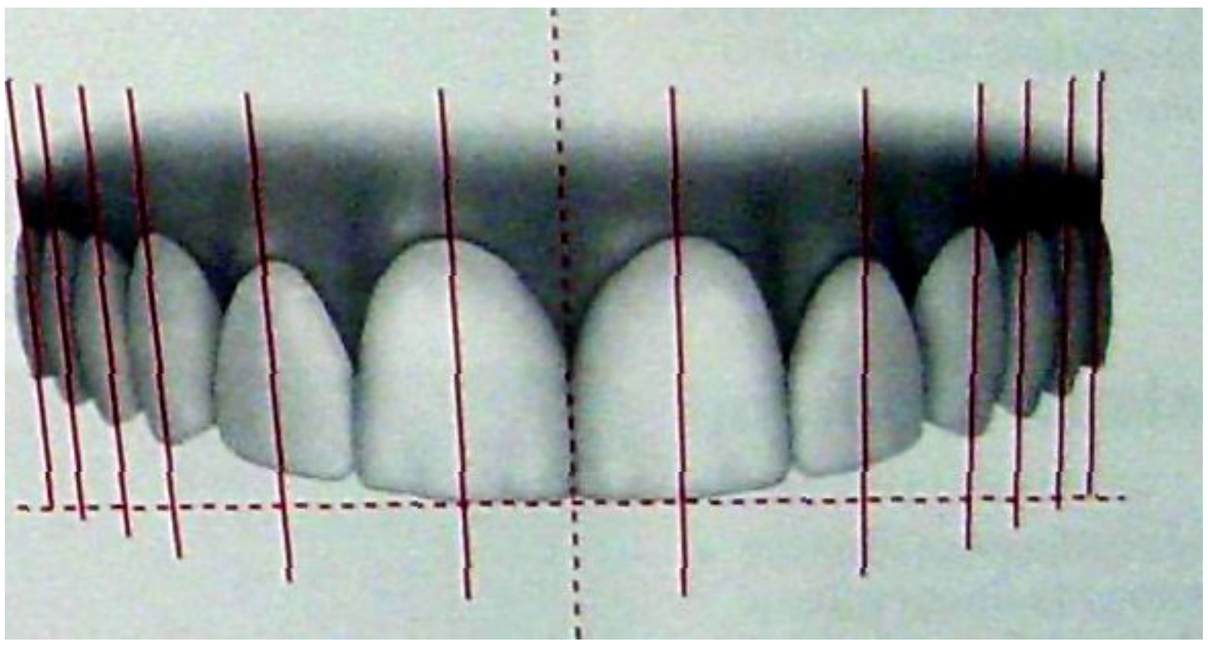


fig. 4
Axial Inclination

ACCREDITATION CRITERIA
USING DIRECT RESIN CASES

Before Treatment

SMILE *list*

- TTie smile *Urn refers to an* imaginary lrne along *tho* rncisal edpes *of the* maxillary *teelh* which shou/d *mimic* lhe curvature of the superior border of the lower lip while smiling.

- *M^γ* limes patients will not smile fully \(they are not happy with *ihe appearance* of *heir teeth,

- Esthetics, phonetics, and the smile *Une* will help determine the *mctsal* edge position.

Facial asymmetry can sometimes prevent the *nc\sal* edge from following *ihe* smile line.

Gingival reconiourrng is evident *in* the subsequent photographs.



BeforeTreatment

After Proper Treatment

SMILE LINE

- The canines and laterals seem as if they are impinging *on* the lower lip. However, lip position and anatomy (check the before picture) rather than tooth length or position are the contributing factors to such an impression.

[1] In this photograph the lower lip seems lhicker where it coniacis the maxillary laterals and canines.

In this case either *oi* the two "after" photographs is suitable to illustrate acceptable, justifiable variations in the smile *Wne**



After Proper Treatment

After Proper Treatment

SMILE LINE

- ft lienIs may smile more broadly once they are pleased with *and* accustomed to their smile. As a result those smile photographs are not identical but *in* this example it does not impair the ability of the examiners to evaluate the work.

' In this phoiogrjph ihe incisors do not and should not follow the smile line, because ot' the extreme curvature of the lower lip.

These incisors are correct in length and symmetry.

The centrals should always appear slightly longer or at least not any shorter than the canines along the incisal plane.

Midline *&* axial inclination *are* acceptable.



After Proper Treatment



Improper Treatment

Improper Treatment

The midline should he perpendicular 10 the incisal plane and parallel to the mid line ot the face.

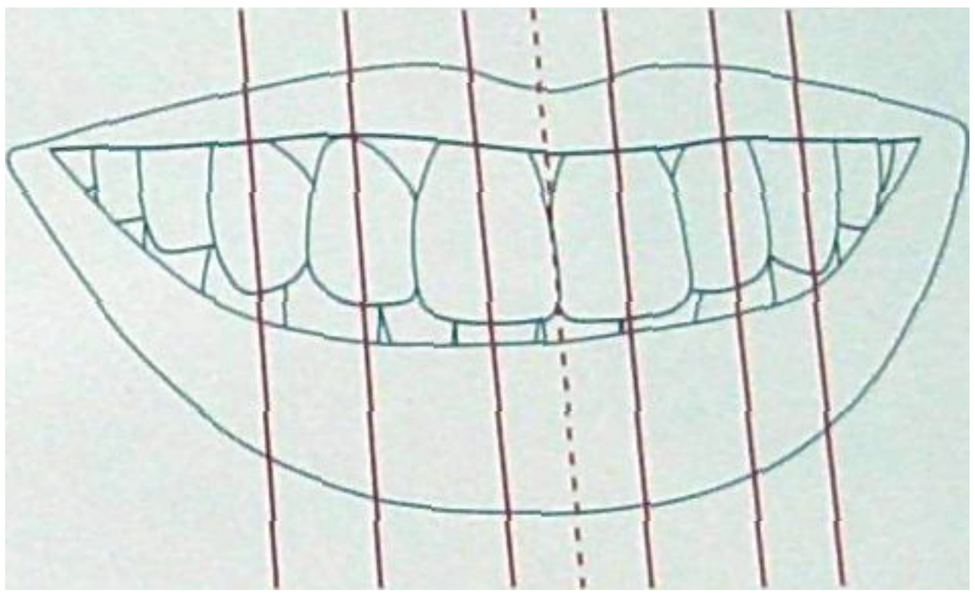
Smnll discrepancies between facial and dental mid lines sometimes may not be noticeable,

A canted midline such as in this case is readily apparent.

Axial inclination on the left side is inappropriate.

Dominance of the centrals is not established

* Symmetry i* lacking,
- The smile line in this case is acceptable, it does not follow the superior border ot the lower lip due to lip asymmetry.



Fig,5
Midline, Axial Inclination

MIDLINE, AXIAL INCLINATION

- For ease of illustration, vertical lines evaluating midline and axial inclination are super-imposed on a stylized tracing of the preceding photograph,
- This midline is not vertical. It is canted.
- The axial inclination of the right central, lateral and canine shows the desired mesial inclination.
- However the left central, lateral and canine display inappropriate idisial) inclination.



Improper Treatment

Improper Treatment

AXIAL INCLINATION

- From the central to the canine there should be a natural progressive increase in the mesial inclination of each subsequent incisor.
- The axial inclination is incorrect far the palienfs left central
- The midline is canted,
- The smile line h incorrect. It is asymmetric-
- Teeth are impinging on the lower lip.

ARE THE *INOSAL EDCES IN HARMONY* WITH THE jAIiLFUNE?

IF NOT, IS jr *BECAUSE FACIAL* ASVMAIFT«¥ *HfQUiRfSA OIFFERZST* APPKOTCH?

IS THf MJDUNf COKttiCT?

tS THE AXIAL MCLINATIOK APPROPRIATE?

INCISAL EMBRASURES

Are the faci&il embrasures proper? Is there a natural progressive increase in the incr&il embrasure size from the central to the canine?

Ia the interproximal contact or connector proper in length and position?

The *incisal* embrasures should display n natur.il, progressive increase in *size* or *depth from the central to* Ihe oinine (Fig, 6}. This is a function of (he anatomy *of these teeth and* as a *result, the* conwci poirrt moves apicalfy as we proceed from centra/ to canine. The contact points \r\ their apical progression should mimic the *smile line (fig. 7),* Failure to provide adequate depth *and* variation to the incisal embrasures *wiU:*

/. make the ieelli *appear* too uniform
2. make contact *arsas too* long and will impart to the dentition a box-like appearance. "Die individuality of the incisors will be lost if their incisal embrasures are not *properly* developed.

\f the incisJl embrasures are not *deep enough ii* can resufl in excessively Jong contacts or connectors.

ii the incisal embrasures are too deep it will lend to *make* the teeth look *unnaturally* pointed.

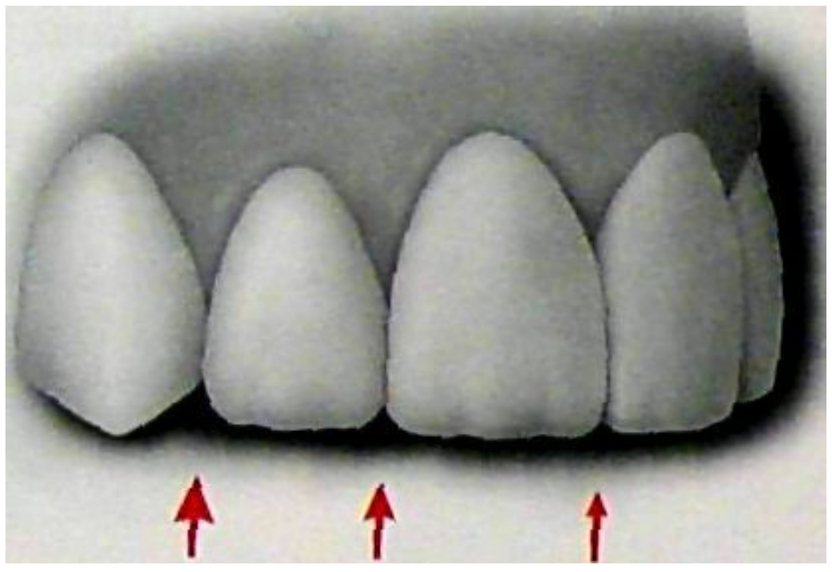


Fig. 6
IncisalEmbrasuros
The incisal embrasures should demonstrate a natural, progressive increase in size from the central to the canine.

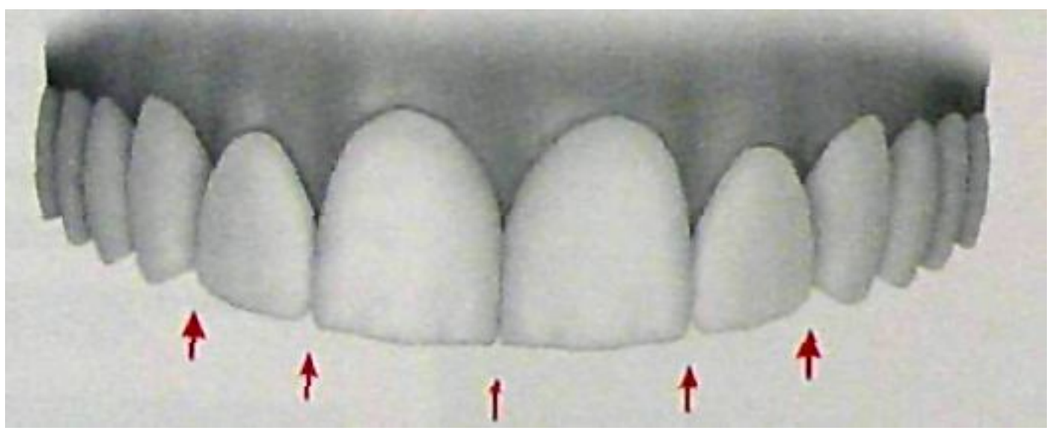
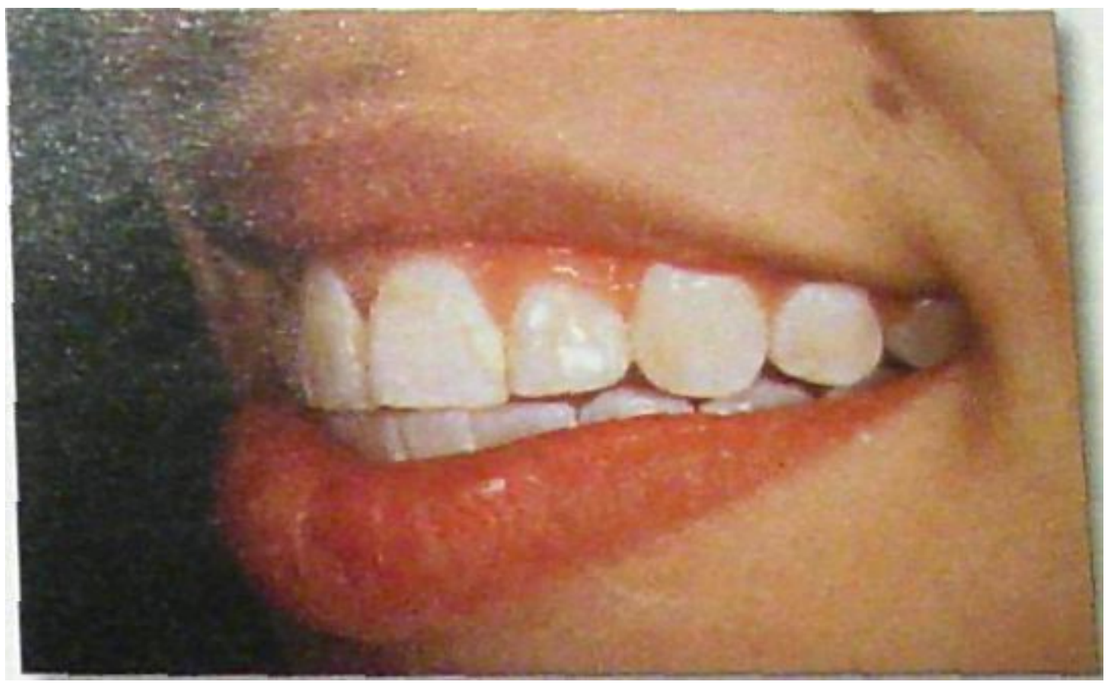


Fig-7
Incisal Embrasures

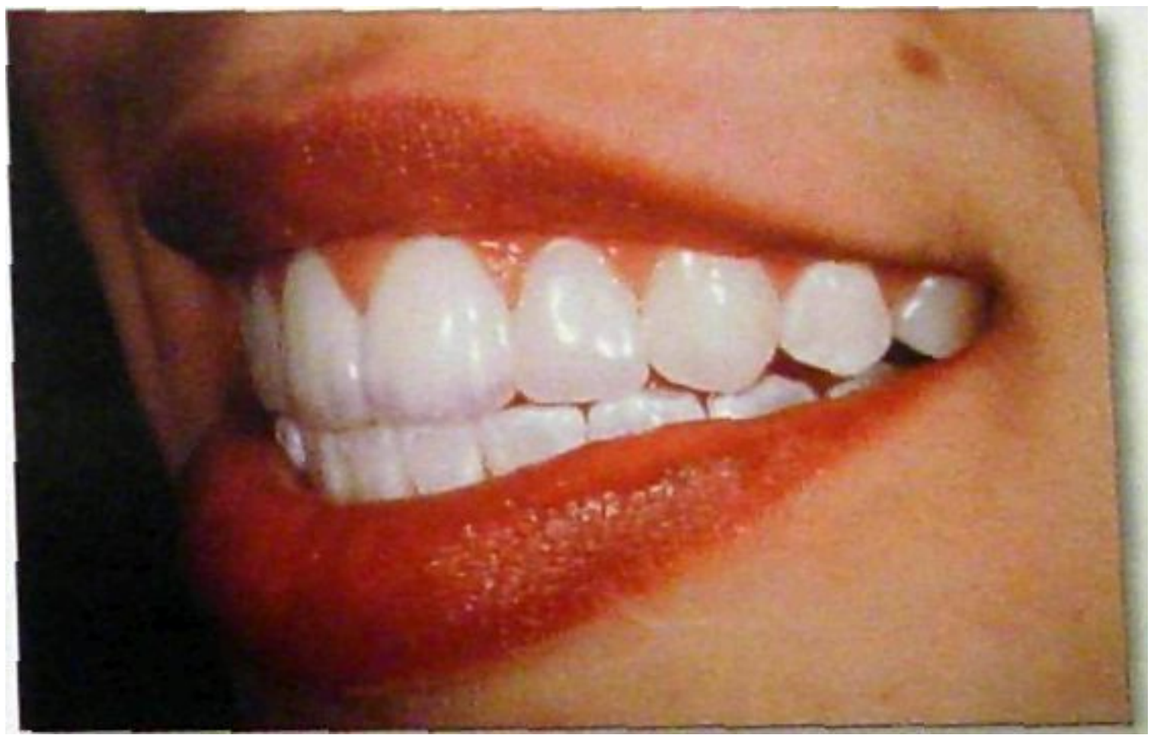


Before *Treatment*

Before Treatment

INCISAI EMBRASURES

- inci&al embrasures should ditptav a natural, progressive increase in. size Irom ihe central to the canine.
- Improved embrasure form, contact and proximal contour is required in this case.
- Proper gingival contouring should correct length and axial inclination at the



After Proper Treatment

After Proper Treatment

INCISAL EMBRASURES

- Improvement is evident in incisal embrasure form, contact, and proximal contour
- Proper gingival contouring has corrected the length and axial inclination of the Lateral.



Improper Treatment

Improper Treatment

INCISAL EMBRASURES

- The incisal embrasures are improper.
- Incisors are flared toward the facial.
- The two thirds of the facial contour thai is visible is too flat. These errors will result in improper Incisal edge position.
- The smile line & most particularly phonetics, help determine the incisal edge position.
- It is also influenced by emergence profile & labial contour.

PRINCIPLES OF PROPORTION & CENTRAL DOMINANCE

Are the principles ofgolden proportion and central dominance appropriately used?

Central dominiince *dictatos* thai the *centrals* must be the dominant teeth in a smile' *and* they must display pleasing proportions (Fig. *81* They are the key *IQ* (he smile[2].

The proportions of the centrals must be aesthetic and mathematically correct * The width to length ratio of the centrals should be approximately 4:5 (O-β *to* 1.0). A range for *their* width *of 75% - 80%* of their length is most acceptable'. Knowing ihe current width *oi* the worn, short centrals we can thus calculate their proposed, ideal, esthetic length. The shape and location *oi* the centrals influences *or* determines *ihe* appearance *and* placement of the laterals and canines.

*Fig*8*
Proportion of Centrals

The principles of golden proportion suggest that there is an ideal, mathematical ratio [1.6 :1 : 0,6)'[fl,u:] between (the apparent rather than the actual) widths of the centrals, laterals and canines when they are viewed simultaneously from the front. The discrepancy between the apparent and actual widths is explained by the positioning of these teeth along the curve of the arch (Fig, 9).

These principles are used as a guide rather than a rigid, mathematical formula. As mentioned previously, most authors' recommend creating harmony and balance by eye via proper adjustment and evaluation of provisionals" rather than mathematical formulae.

A sense of proportion must be displayed by these teeth and the dominance *of* the centrals must be readily apparent.

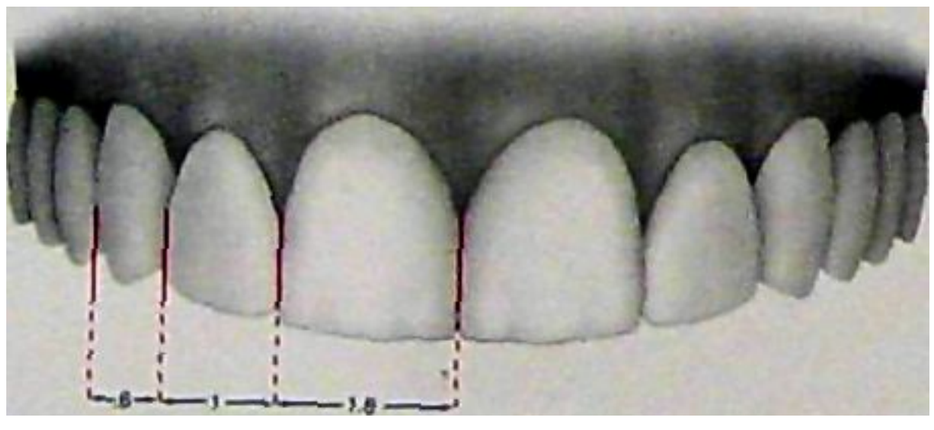


Fig. 9
Golden Proportion
Golden Proportion is based on apparent width from the frontal view.



Before Treatment

Before Treatment

PRINCIPLES OF PROPORTION
CENTRAL DOMINANCE

- The centrals are the key lo ihe
- The width to length ratio of the central* shouW b 4 5

Golden Proportion sup^csts that there is an ideal mathematical ratio of 1,6 : 1.0 : 0,6 between the apparent rather than the actual widths ot" the centrals, laterals canines when they are from the front. This is only used as a guide

The acceptable range for the width of the centrals is 75% - 80% ot their length.



After Proper Treatment

After Proper Treatment

PRINCIPLES OF PROPORTION & CENTRAL DOMINANCE

- The centrals are dominant.
- Excellent tissue health is present.
- Improved axial inclination and toolh length is evident.
- The proportion between the six anterior* is harmonious.



Improper Treatment

improper Treatment

GINGIVAL POSITION & PERIODONTAL HEALTH

- Gingival margin on the four incisors is located too far apically particularly in comparison to the canines. This makes the incisors seem too long at the gingival.
- These centrals are too short at the incisal and thus make Ihe smile line too flat. This smile may even be inverse bul because the teeth are not separated the diagnosis is difficult.
- Gingival inflammation is present around teeth 10 and 11.
- The cervical incisal length of these anterior teeth is not symmetrical

EMERGENCE PROFILE

Is the emergence profile naturalf

The emergence profile must *m\nvc* the silhouette of Ihe natural dentition, in the gingival *one third,* when viewed from both *ihe* facial *und* lateral views. A proper emergence profile will help avoid swelling and inflammation" of soft tissue or conversely it will prevent the appearance of unsightly dark spaces in the cervical (pingival) embrasure. The emergence profile must reproduce in porcelain, or other material of choice, the *idealized,* natural eruption of enamel from healthy gingiva.

In bridge preparation a properly prepared pontic site *in* combination with an ovate pontic *can* result in a very natural and attractive emergence profile.

In cosmetic dentistry, the emergence profile relales *io* two separate aspects of a tooth surface (labial & interproximal). The interproximal emergence profile deals with the mesial *and* distal silhouette *oi* a tooth at its gingival one-third. It is closely related *to* the criteria of cervical embrasure. An improper interproximal emergence profile will adversely *affect* the soft tissue of the gingival embrasure resulting in swelling and inflammation of the papilla or a black triangle caused by a blunted papilla. The interproximal emergence profile in the lateral *\'iew* is evaluated on teeth closest to the viewer. In Fig. *^0_l* that would refer to the right canine. Literal and central. *Conversely,* the labial emergence profile *is* evaluated in the lateral *yiew on ihe coniraUteral* teeth. In Fig. 10, that would be the left central and lateral. The labial eme^ence profile deals with the labial silhouette *oi* a tooth at its gingival one-third. It is related to the criteria of three labial planes.

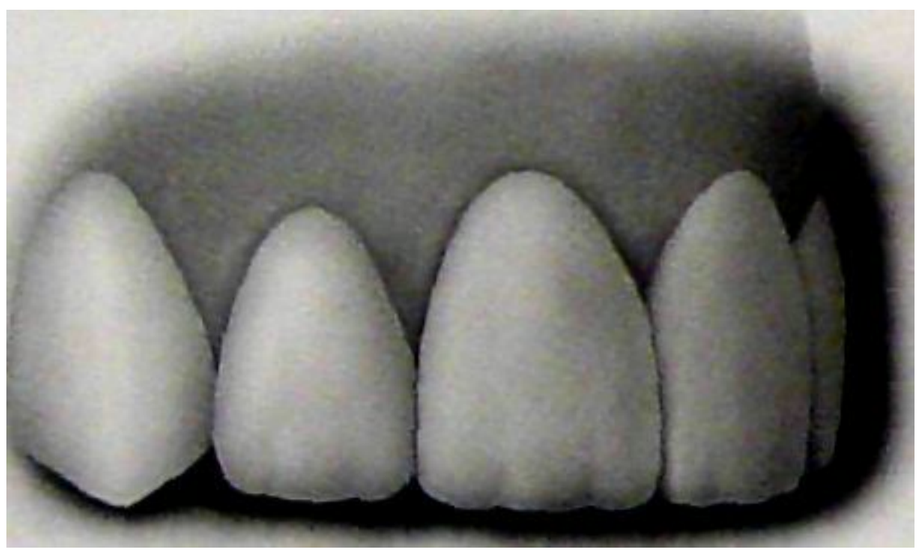


Fig. 10
EmergenceProfile

PERIODONTAL HEALTH

Is the periodontal health optimal?

The gingiva should be pink, stippled, firm and it should exhibit a matte surface. The papillae should be pointed and should fill the gingival embrasures right up to the contact area. This will avoid open cervical embrasures and black triangles.

Periodontal health must be established prior to placement of final restorations and if at all possible even before commencement of restorative treatment- In order that the gingiva be healthy, special care must be paid to all aspects ot treatment trom preparation and impression taking to tcmporization.The provisional* must di&plav excellence of fit, marginal adaptation, emergence profile, gingival contour, incis&i contour, and a properly developed occlusion in centric and excursive movement.

Notes:

Before Treatment

EMERGENCE *PROFILE*

. *The* emergence proWe must reproduce in iTWierial of choice, ihe idealized, natural eruption of enamel from *healthy*

- A proper emergence profile will help swelling & inflammation of soft (issue.



Before Treatment

After Proper Treatment

EMERGENCE PROFILE & CERVICAL EMBRASURES

- Excellent incisal and cervical embrasure form fs present,
- The emergence profile fs very natural*
- Tissue health fs excellent.



After Proper Treatment

Improper Treatment

EMERGENCE PROFILE, CFRVICAI EMBRASURE & INTERPROXIMAL CONTACT

- Inadequate incisal embrasures are evident.
- As a result the coniacts are too long, particularly between the canine and the lateral.
- T?ie proximal contour and emergence profile is not natural on some of *ihe* surfaces such as the mesial oi the canine.

' Gingival heallh is lacking, particularly on the interproximal or' the maxillary canine and lateral.

[1] This is a case with possible occlusal problems. Candidates should be prepared to answer questions regarding each patient's occlusal status.



Improper Treatment

Incisal EDGE POSITION

Are incisal edges in harmony with the smite Unei If not, is il because facial asymmetry requires a different approach?

In the occlusal vivw$_r$ is the incisal edge position appropriate and is there a definitive jneisaf *edge?*

Phonetics help determine (he incisal edge position (IEPj.The incisal edges should lightly louch the vermilion border of the lower lip when making F a V sounds'* '\ This location then helps to verify the length ot each tooth. The principles of proportion are also instrumental in determining desired tooth length. The pitch of each anterior looIh is determined by the combination of correct lip support and the linguolabial position of the incisal edge. This location influences anterior guidance and the labial and lingual contours. All these factors play a dominant role in both esthetics and function[11].

Correct incisal edge position is crucial because it is related to the pitch of the anterior teeth, labial contours, lip support, anterior guidance, lingual contours and tooth display.

The proper incisal edge position *h* determined by:

1. Incisal display.
2. Phonetics. Lip placement during formation of **F sounds.**
3. Incisal and occlusal plane. The centrals are probably too short if they are above the occlusal plane when viewed from the side and they may be too long if they are below the occlusal plane.

Ttie incisal edge must be definitive and clear. This stipulation also applies to the proximal and facial line angles.

The IEP is influenced by the emergence profile and labial contour



Fig.11

Incisal Edge Position can be evaluated in the facial & lateral views. *It should also be judged as it relates to the vermilion border of the lower lip during formation of* "F *and* V" *sounds.*

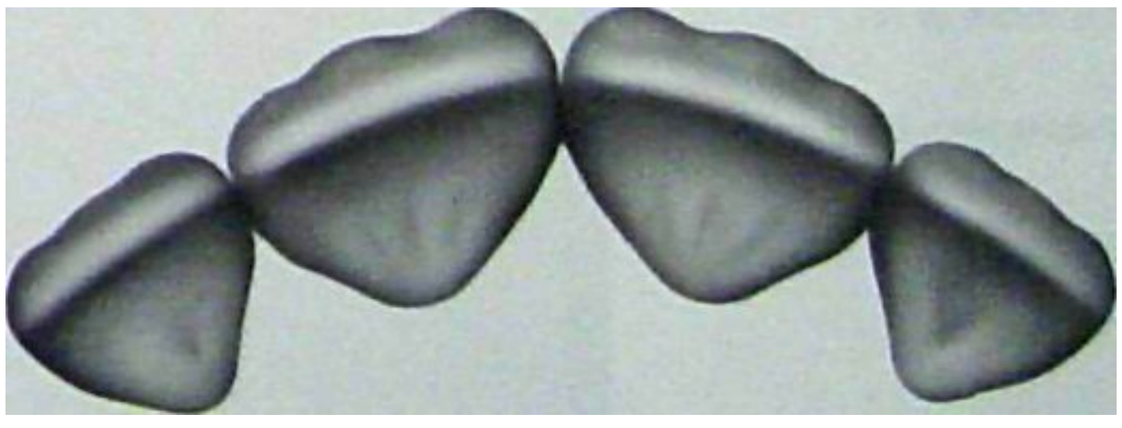


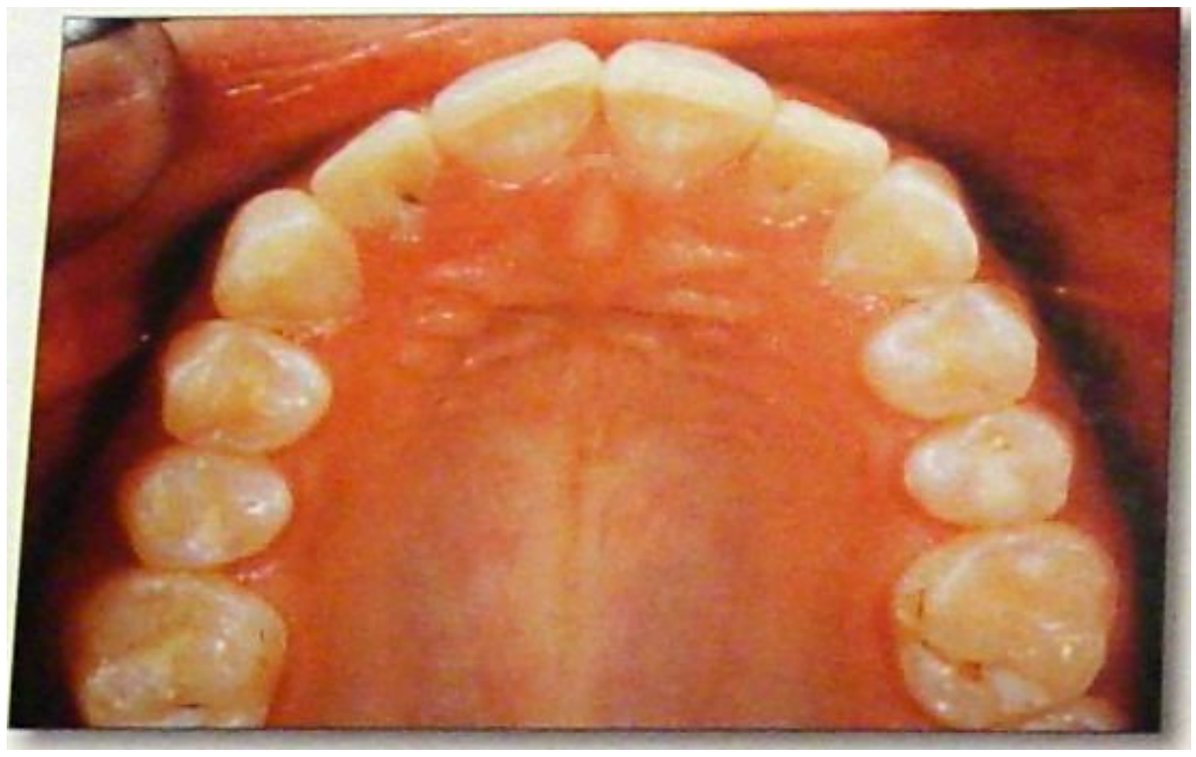
Fig.12

Definitive Incisal Edge. In the occlusal view the incisal edge must be definitive. The facial embrasures should be deep and clear
Theproximalcontofj^houldbe/Jijira*l*.

Before Treatment

DEFINITIVE ***INCISAL*** *EDGE &* ***LABIAL*** **ANATOMY**

- The presence of lobes will *altow* a more *natural & varied pattern of reflected light.*
- *A definitive incisat edge should be* present. Provfm.iJ *&* fcictaf *line angles must be* visible.



Before Treatment

After Proper Treatment

DEFINITIVE INCISAL EDGE & LABIAL ANATOMY

- A definitive incisal edge is present.
- Proximal and *facial* line angles are clear,
- Labial *anatomy is* evident.
- *In this* picture [he definitive incisal edge on one *central is difficult* lo see because of light reflection and application of lints.



After Proper Treatment

Improper Treatment

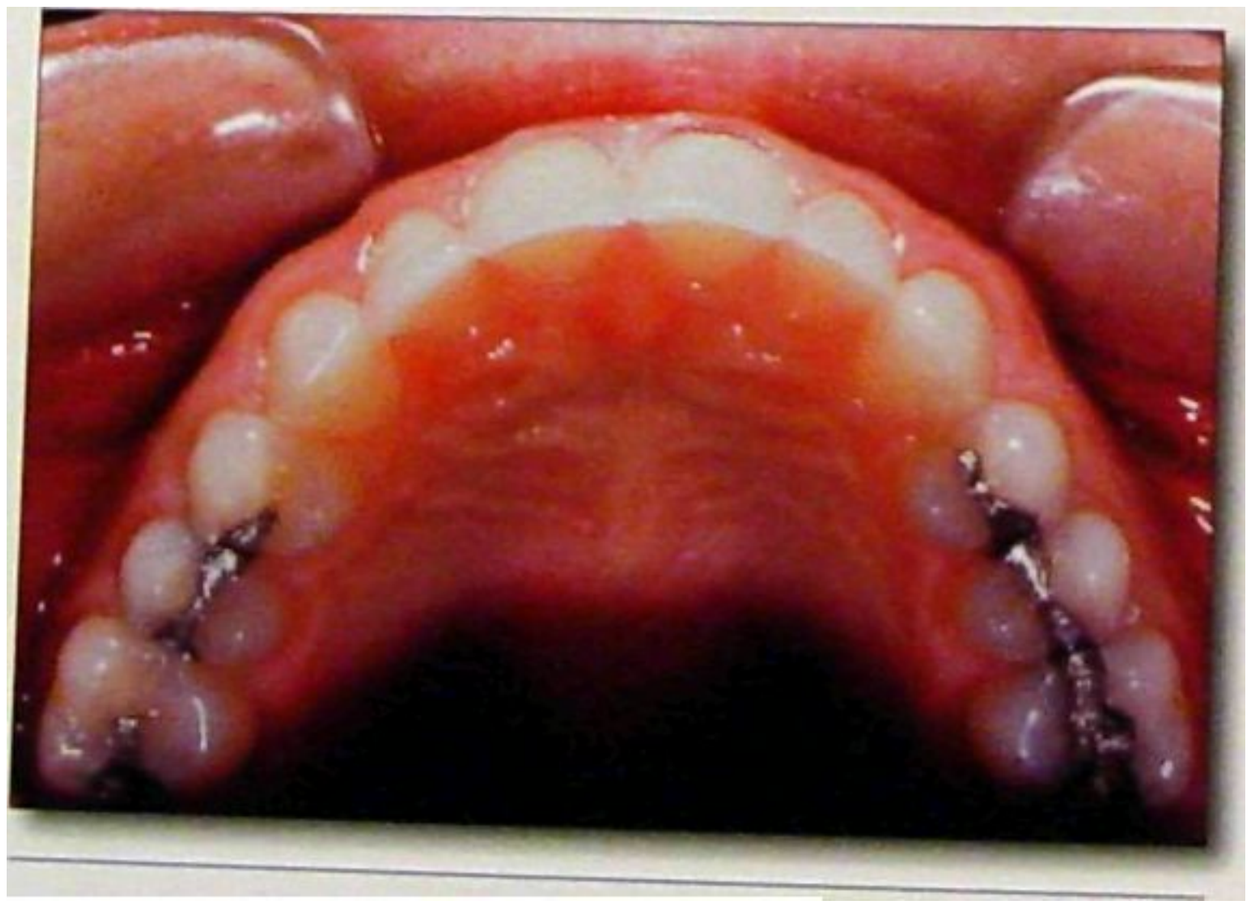
LABIAL ANATOMV

- The devefopmeni o/ the incisal edge seems incomplete.
- This pholo is Mken from loo much of a facial view and unfortunately this may be conlribulrng further to the impression ihal (here is no definitive incisal edge.

[1] There is an absence of definitive proximal and facial line angles.

The facial surface is loo rounded.

Labial anatomy is absent.



Improper Treatment

LABIAL ANATOMY

Is the labial anatomy appropriate?

"Hie labial anatomy should mimic the morphology of the natural dentition. The presence of lobes is very important because it will allow a more natural and varied pattern of reflected light. The proper placement of lobes can also influence the perception of width. Incisors of similar dimensions can be made to appear wider by placing the lobes slightly closer to ihe interproximal surfaces and conversely teeth can be made to appear narrower by locating the lobes and height of contour slightly closer together.



Fig. 13
Labial Anatomy. A Varied pattern of reflected light is made possible by the presence of lobes. This is apparent in the lateral view.

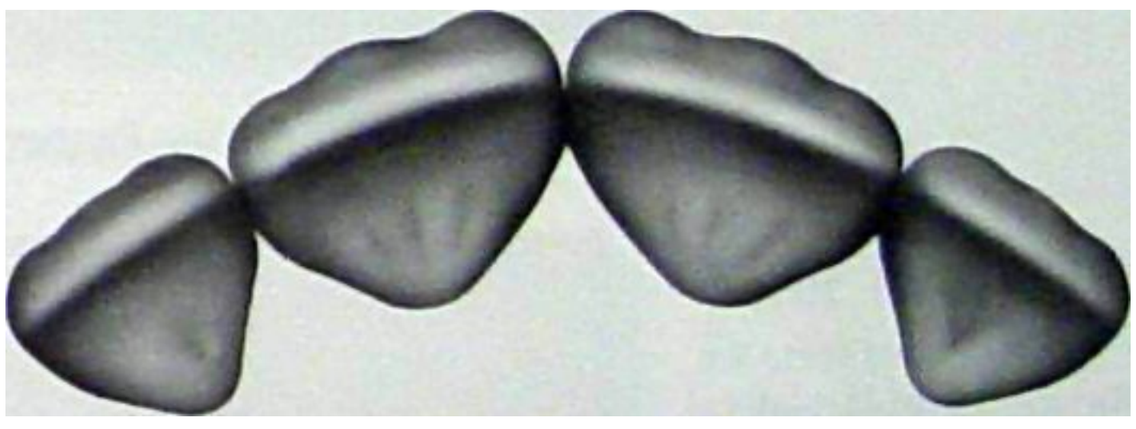


Fig. 14
Labial Anatomy. Lobes should be evident Facial embrasures should be clearly defined, V-shaped and the proximal contour should be natural.

Before Treatment

LABIAL AUATOMY

- *Labia! anatomy is not appropriate.*
- Emergence profile *is not ideal.*

> Gingival shape *and height oi the central and most particularly of the lateral needs improvement.*

The Literal appears very short.



Before Treatment

After Proper Treatment

LABIAL ANATOMY & EMERGENCE PROFILE

- *Labial* analomy Js clearly evident.
- *Periodontal health is* present.
- Emergence profile is most natural.

[1] Gingival shape and height are improved.

Tooth proportion is more ideal.



After Proper Treatment

Improper Treatment

PERIODONTAL HEALTH

- Tne periodontal status on the mesial of the lateral and ihe facial of the canine is questionable,
- in some areas the tissue seems bulbous and swollen.

In other areas the gingiva is shiny instead of stippled.



Improper Treatment



f'g- 15
Chroma, Translucency, Halo, & Color Gradient

Shade

- Involves value, hue & chroma
- The restoration should be polychromatic.
- A color gradient should be apparent.
- The gingival third should be richer in chroma.
- The incisal translucency should appear natural.
- A halo, if present, should provide contrast to the Irnnslucency a! the incisal edge.



Before Treatment

Before Treatment

SHADE SELECTION

- Hvpoca leitied, opaque areas should be corrected.
- Shade should be appropriate, natural, and polychromatic-
- Any iranslucency present must seem natural & may suggest the presence of internal lobes.



After Proper Treatment

After Proper Treatment

TRANSLUCENCY

- Natural looking incisal translucency is evident This can be developed via shades or tints.
- "Show through" was avoided in this case,
- Surface polish & texture are appropriate.

Improper Treatmenf

TRANSIUCENCV

- Tire *incisal* iransfucency *in* this *case is* unn.ilur.il- *It* is further accentuated by the *black* background.
- The contact & embrasure form between the two centrals is nol appropriate.

The length, shape *&* position of the interproximal contact \s determined by the proximal *contour,* the inctsal embrasure, ihe cervical embrasure and (he depth of the facial embrasure.



Improper Treatment

Improper Treatment

SHADE SELECTION

- The facial anatomy is not appropriate. It seems to uniform and smooth, ft lacks contour and leMure.
- These restorations appear very monochromatic
- The centrals do not match each other in value ((his may be due to the underlying tooth color). The right central is high in value and the left central is low in value.

Major errors *in* hue can be catastrophic but even minor mistakes in value can often be just JS obvious.



Improper Treatment

!STH£1NC!$AL TRANSWCtNCr AND HALO EFFECT APPROPRIATE?

IS THE COtOR (HUE, VAlUE, CHKOMA) SELECTION APPROPRIATE AND NATURAL, NOT MONOCHROMATIC?

IS THE LABIAL AMATOMY APPROPRIATE?

SHADE SELECTION

Is the color (hue, value, chroma) selection appropriate/natural, not monochromatic?

Are the effects of internal and surface color characterizations appropriated

Is mcisal translucency and halo effect appropriated

Shade selection must be customized for each individual, It should be appropriate, natural and polychromatic. The body of the tooth can be fairly uniform in color but the gingival third should be noticeably richer in chroma. If appropriate, a thin halo cnn be incorporated in the restoration and the presence of mamelons may be desirable in many cases. Maverick stains and crazing lines as long as ihey are faint and not overpowering, can add lo a pleasing result.

Translucency can vary from bluish-white to blue, gray, orange and other variations. In some incisors the bluish appearance of the incisal edge is broken up by a white line at the incisal tip of the tooth. This is called a halo or the "halo effect" and is caused by full reflection of light in that area*.

Three terms - namely hue, chroma, and value can be useful in describing color or shade:

Hue has a certain wave length and refers to what we normally consider as color or shade, i.e., red, yellow, or blue-

Chroma refers to the intensity or saturation of a color. It describes the different strengths or shades of the same color-

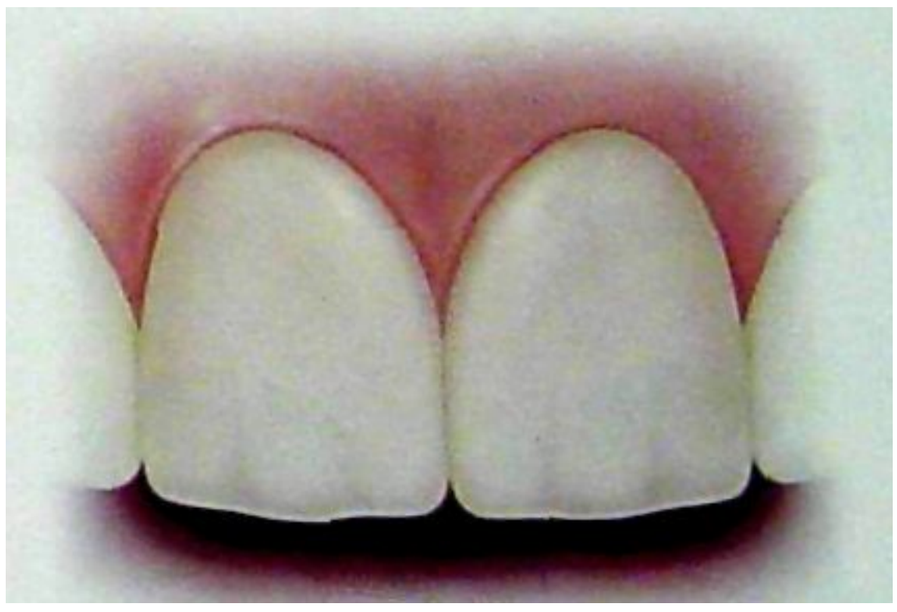


Fig.16

Chroma,Translucency,Halo,&ColorGradient

SHADE SELECTION

is the color (hue, value, chroma) selection appropriate/natural, not monochromatic?

Are the effects of internal and surface color characterizations appropriate?

Is incisal translucency and halo effect 3ppropriatet

Value describes relative brightness. It deals in matters of dark and light and is influenced by the amount of grey it exhibits. Objects that are dark have less value and objects that are light or bright have high value*

Even though value can best be evaluated in black & while photographs, it is perhaps the most influential aspect of color selection".

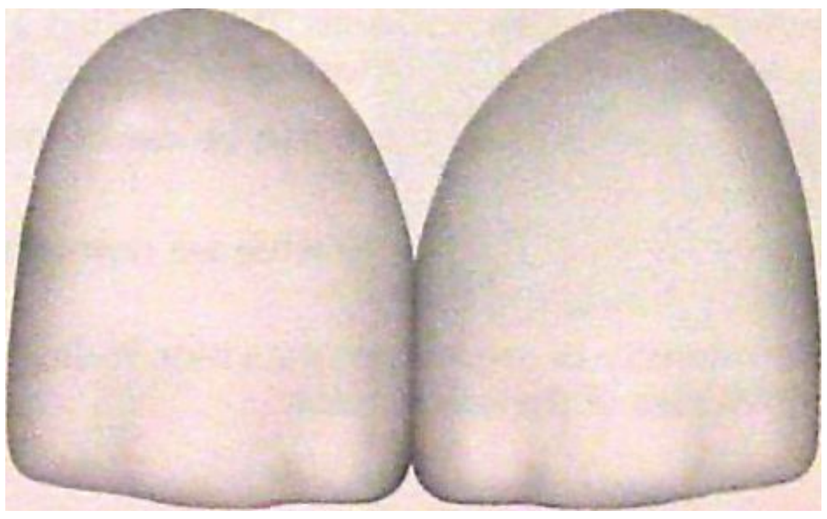
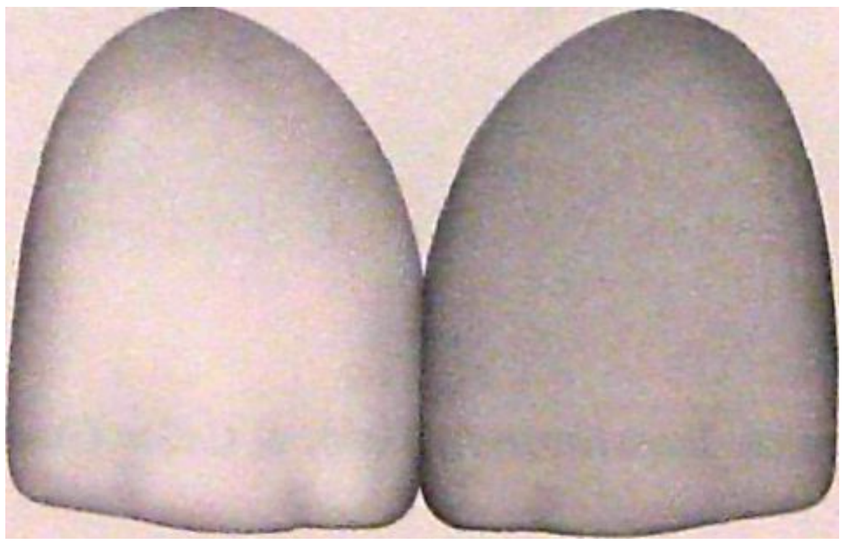


Fig. 17
Both centrals display value that is well matched

Value too high.

The value of this central must be toned down if it is to match the opposing iooth.



Value too low.

The value of this central must be increased if it is to match the opposing tooth.

Fig. 18
Value does not match

ACCREDITATION CRITERIA
USING INDIRECT CASES

Before Treatment

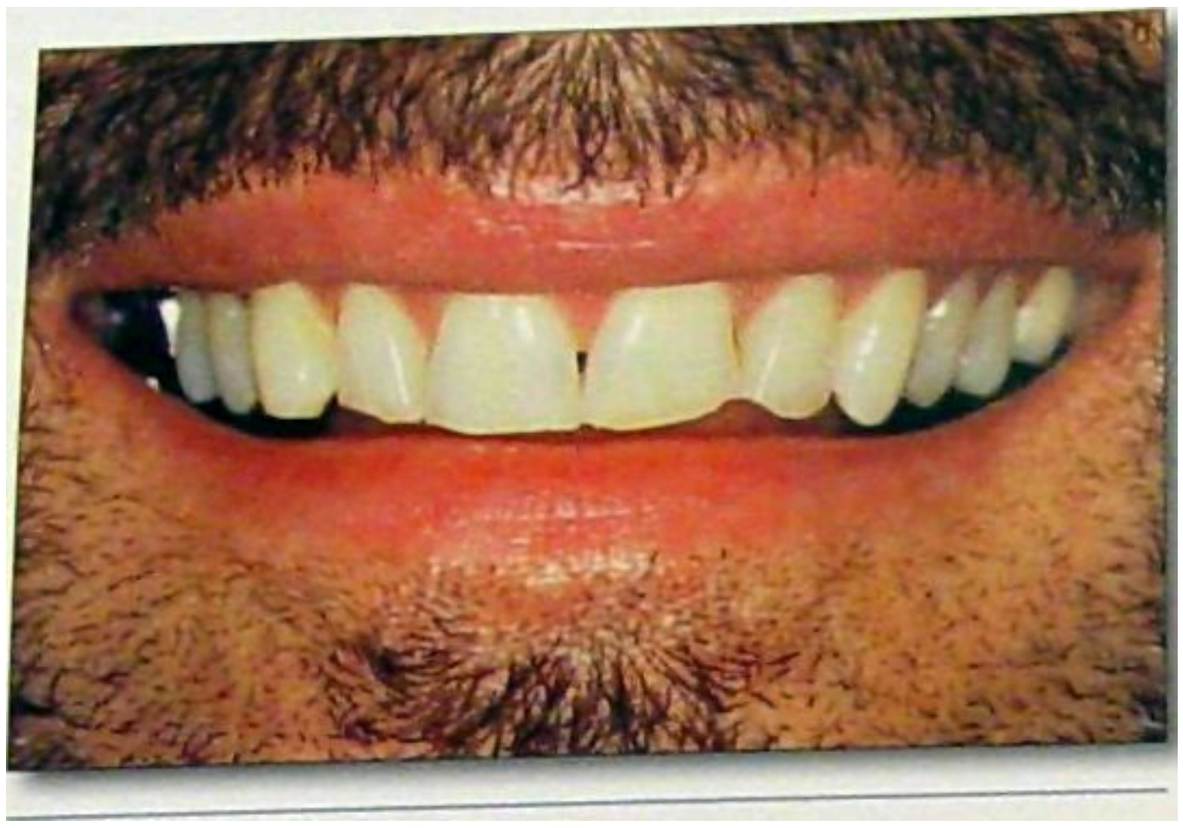
SHADE SFIECTION

. The anterior leeih in *this* photograph have *lost* much o/ihe rncisal one-ihird.

. 5uch teeth lend to be fairly monochromatic,

- The jncisal can convey translucency.

. The body of (he tooth can be foirly uniform m color.



Before Treatment

After Proper Treatment

SHADE SELECTION

- Natural gradient *o*< color and characterization Is incorporated into these restorations.
- The smile line is appropriate.
- The midline *&* the axial inclination are as they should be.
- The rncisal conveys translucency.
- The gingival one-third is richer in chroma than the body.

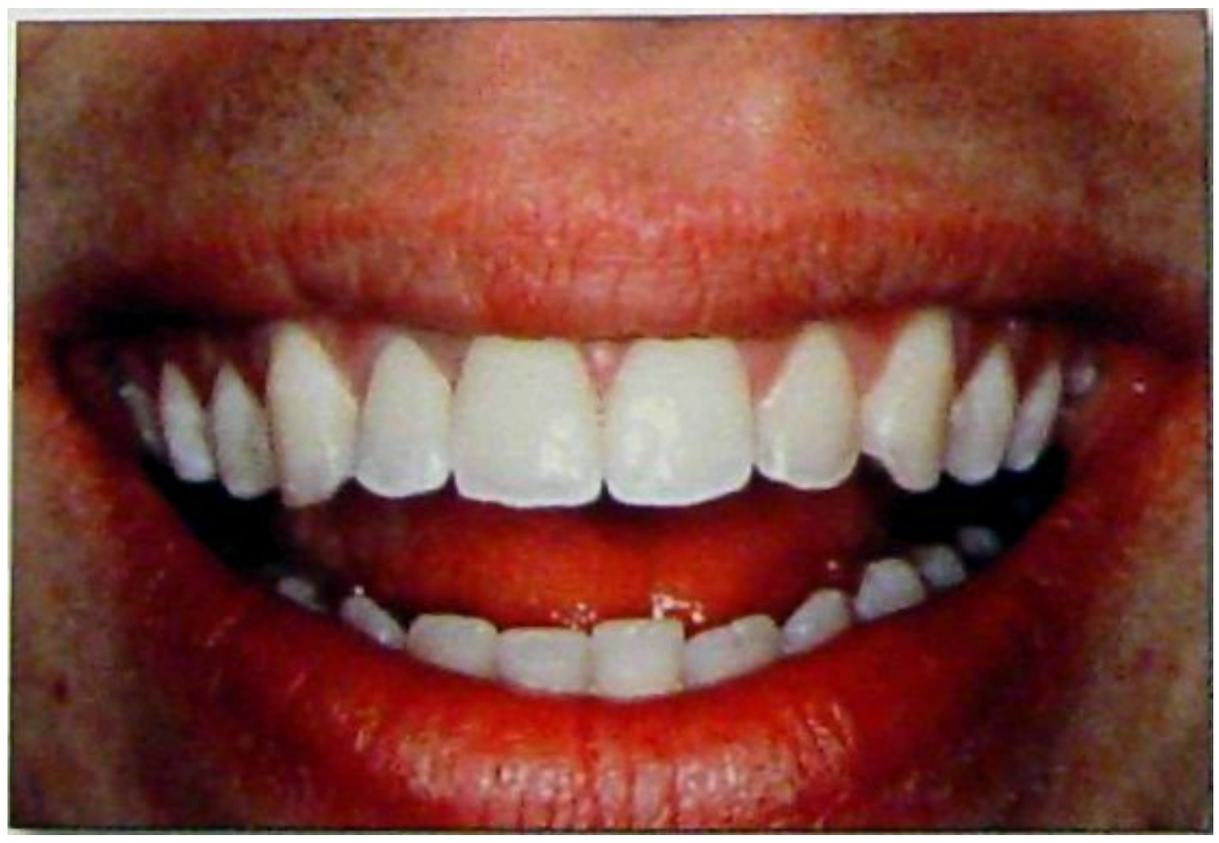


After Proper Treatment

Improper Treatment

COLOR CHARACTERIZATION

- These restorations exhibit unnatural characterization and {hey are low in translucency.
- The maxillary right lateral is improperly inclined. It is flared to the facial.



Improper Treatment

BUCCAL CORRIDOR

h the buccal corridor property developed?

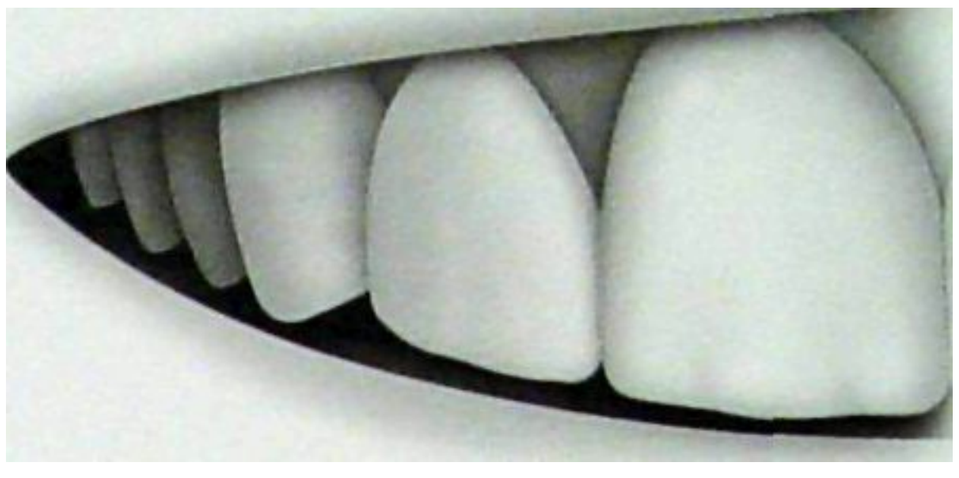


Fig.19
Buccal Corridor/Placement Problem, Schematic depiction of restored canine & incisors.

The posterior teeth seem to be positioned towards the lingual or the canine seems too prominent.

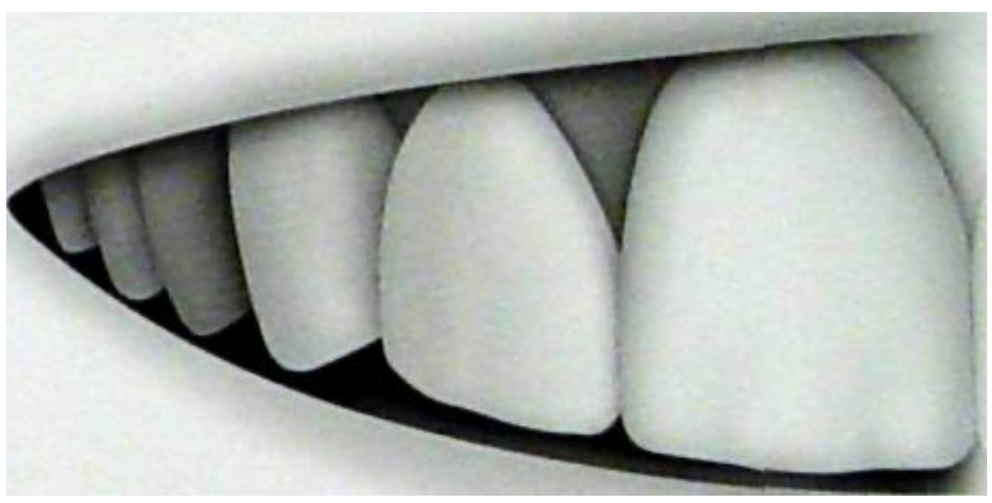


Fig. 20
Buccal Corridor/Value discrepancy accentuates the buccal corridor.

Even if the posteriors are located by nature further towards the facial, the buccal corridor can still appear unattractive because of the discrepancy in value between the restored & unrestored teeth.

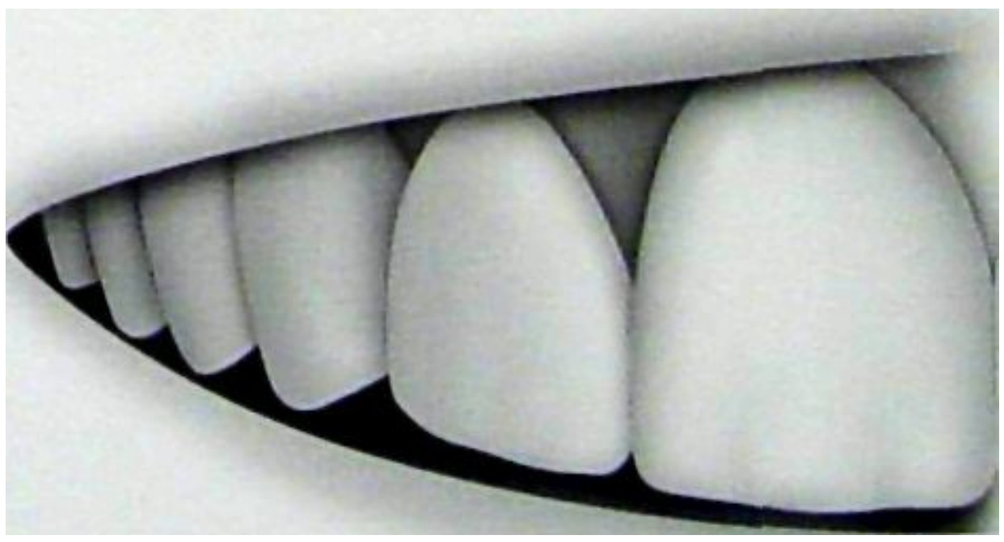


Fig-21
Buccal Corridor is properly treated.

The placement of the teeth and all the line angles in Fig. 20 & 21 is identical, only the value of the posteriors has been altered. The position, size and shape of the canine, lateral & central is exactly the same in all three diagrams.

BUCCAL CORRIDOR

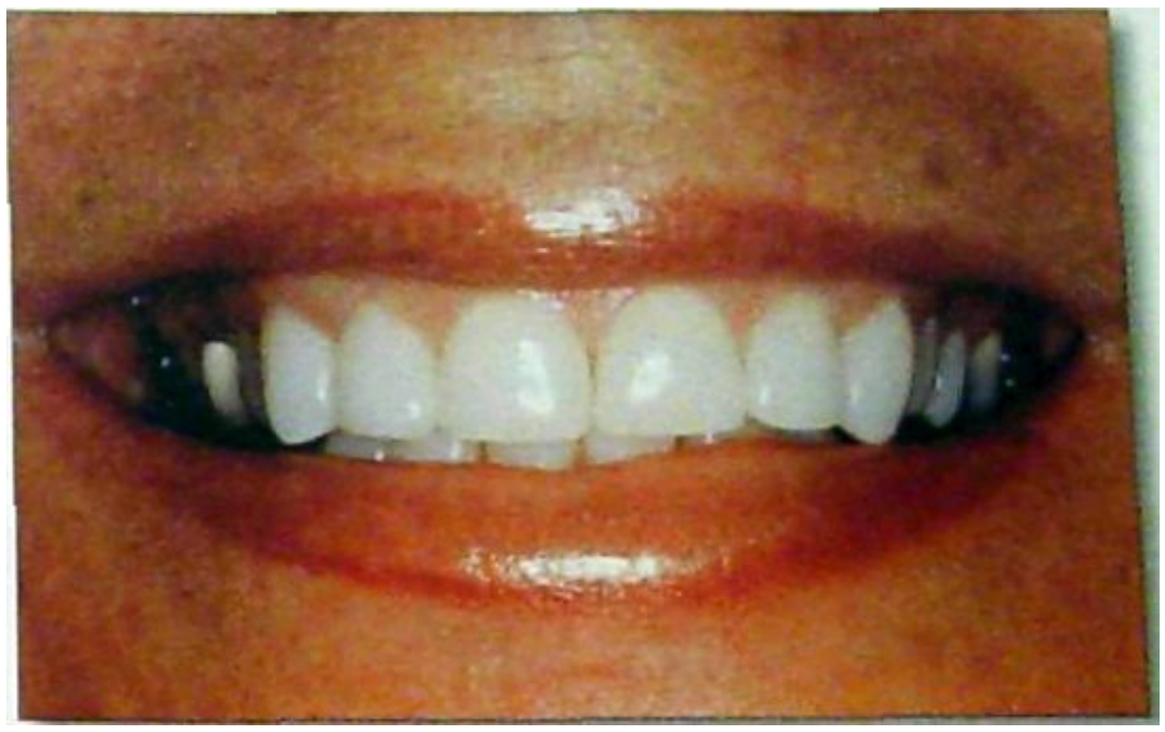
/ the buccal corridor properly developed?*

Buccal corridor refers to [he dark space (negative space) *visible* during smile formation between the corners of the mouth and *the buccal* surfaces *of the* maxillary teeth. Its appearance is Influenced by:

1. the width of the smile and the maxillary *arch.*
2. *the* tone of the facial muscles,
3. the positioning of *ihe labial surfaces* of the upper premolars.
4. the prominence of the canines particularly *at* the distal *facial* fine angle.
5. *any* discrepancy between the value of the premolars and the six anterior teeth.

Arch form has a direct influence on the buccal corridor. The *ideal* arch is broad and conforms to a U shape. A narrow arch *is* generally unattractive, *h* disrupts the principles of golden proportion and makes the centrals appear far roo dominant. Patients wrih very narrow arches may require orthodontic and possibly surgical intervention prior to restoration in order lo achieve excellent results. The unattractive, negative space should be kept to a minimum. This problem can be solved or minimised by restoring the premolars. The buccal corridor should not be eliminated completely because a hint of negative space imparts *[o* the smile a suggestion of depth[1].

The negative space is often accentuated when only the six maxillary interiors are rejuvenated- The improvements in hue and value of these newly restored teeth often exaggerates the sense of depth, darkness and prominence of the buccal corridor tFig.19,20). Because *of* this concern, it is advisable in some cosmetic cases to include the premolars in the restorative plan (Fig. 21).



Improper Treatment

Improper Treatment

BUCCAL CORRIDOR

- The buccal corridor has not been properly developed. The negative space of thi* area is readily apparent especially on Ihe patient's right side.
- Proportion of these centrals is incorrect.
- Reverse smile line is present due to the short central incisors.



Proper Treatment

Proper Treatment

BUCCAL CORRIDOR

- The smile line in this case is correct. However it may appear questionable only due to lip asymmetry.
- The buccal corridor in this case is acceptable; however it is more noticeable on the left side than on the right. Restoring the left second premolar could have improved this treatment.
- In this example the flaw is minor and not detrimental to the overall quality of the case.

LABIAL CONTOUR

The Libf.il contour should exhibit three (gingival, middle, ond incisal} planes. This *should he* evaluated from the JaforaJ view. The *most* common error of anterior restorations is overconlouring rhe rrrcrsal one-third and thereby making the profile of the incisors too straight or *too* flat". The diagnosis for this consists of incisor *profile and* incis.il edge placemen! (IBP) evaluation relative to the mucous cutaneous border of the lower lip during F and V formation. The quality of the *sound is* not relevant because the patient *can* adapt to make the correct sounds even if the IEP fs wrong. This contact location with the lower lip determines the most labial limit of *IEP.* The most lingual limit *of* IEP placement is determined by *the* position of mandibular incisors *and* the patient's tolerable anterior incrsal guidance''. Curvature that is too pronounced will result in a very restricted, uncomfortable anterior incisal guidance. Absence of distinct planes will result fn flat incisor profiles. In bolh instances the IEP will be incorrect.

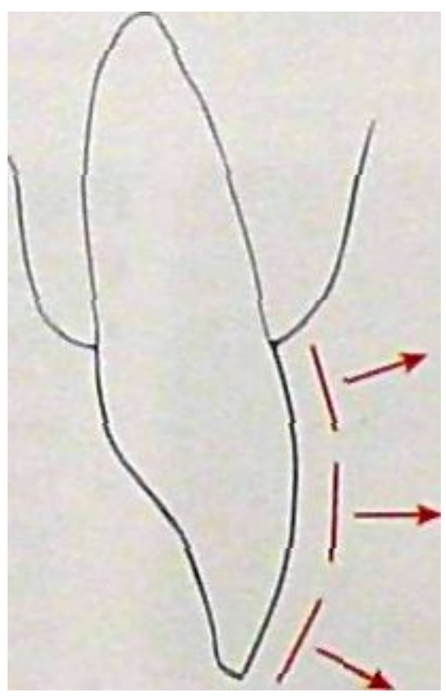
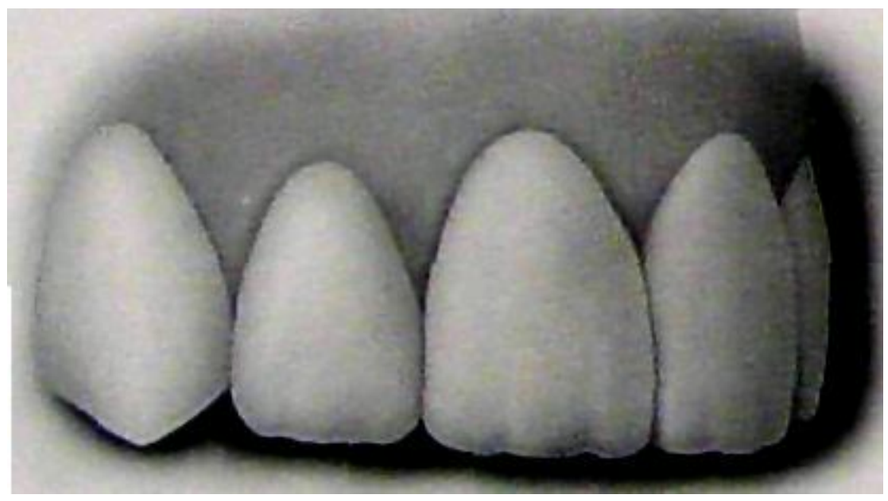


Fig. 22
***Labial Contour (three** planes)*
Line drawing from a cross sectional (90") view



g. 23
Labia!Contour(threeplanes)
Diagram from a lateral view



Before Treatment

Before Treatment

LABIAL CONTOUR

- TVie labial contour should exhibit three planes (gingival, middle, & incisal).
- Much ot the incisal third of These centrals & laterals has been lost.
- Therefore, three planes (gingival, middle, and incisal) are nol present.
- The incisal profile (labial contour! is flat.
- Too often the incisal l/i of restorations is overcontoured resulting in an incisor profile (Labial contourl lhai is too straight or too flat. "This should be avoided.



After Proper Treatment

After Proper Treatment

LABIAI CONTOUR

- The three planes of the labial contour are apparent.
- There is a natural, progressive increase in the incisal embrasure size from ihe central to the canine.
- Labial anatomy is present (note the contralateral central & lateral).



Improper ***Treatment***

Improper Treatment

LABIAL CONTOUR
INCISAL EDGE POSITION

- Proper planes of labial contour are nol evident
- The profile of the left central is loo convex while that of the right lateral and central seems flat.
- The incisors seem lo be impinging on the lip and **their** tips appear to be below the occlusal plane. This suggests thai they are too long at the incisal.

iMBRXSURES

IS ***THEM*** *A NATURAL PROGRESSIVE ISCREASE* ***THE INCISAL*** *EMBRASURE SiZEt*

ARE THERE THREE PLANES FOR wt CONTOURJ

Before Treatment

PINNCIPUS OF *PROPORTION &* DOMINANCE OF THE CENTRALS

- The *width to length ratio of the cenlrate* should be *O.B lo UO* (-*:5J *or* at le.isr the *width* should be m the *range of 75%-80% of the* lertjjlh.
- The centrals *should* dominate the other leeth *in* an *approximation oi* the Golden Proportion.
- The *centrals* should appear slightly longer or at legist DOT *arty* shorter along the incisa/ plane when compared lo *the* canines.



Before Treatment

After Proper Treatment

PRINCIPLES OF PROPORTION & DOMINANCE OF THE CENTRALS

- Previous treatment such as (he crown on the molar may be a distraction, but it will not have a negative impact \i it is functionally correct, exhibits *no pathology* and is not in the esthetic zone.
- Dominance of the centrals is evident.

These restorations suggest compliance with Ihe principles of Golden Proportion resulting in a harmonious distribution of incisal widths.



After Proper Treatment

Improper Treatment

POSITION OF GINGIVA & DOMINANCE OF THE CENTRALS

- The laterals are flared and their gingival levels (particularly that ol" the right lateral) are apical to that of the centrals and canines.
- Dominance of the centrals has not been established.
- A reverse smile line is present.

' No adherence to (he principles of Golden Proportion. Hie laterals are too wide.

These restorations are monochromatic.



Improper Treatment

CERVICAL EMBRASURES

Arc the cervical embrasures properi No *dark triangles.*

The darkness of the oral cavity should not be visible in the interproximal triangle between the gingiva and the contact area. IT the most apical point of the contact area of the restoration is 5 mm. or less from the crest of bone then black triangles will be avoided[1]. At times this will require a longer contact area that will be extended towards the cervical. This will encourage the formation of a healthy, pointed papilla instead of the blunted tissue form that often accompanies a black triangle. Conversely improperly developed cervical embrasures that involve overextended, bulky resiorations will result in an improper emergence proule and swollen and inflamed gingival tissues[0].

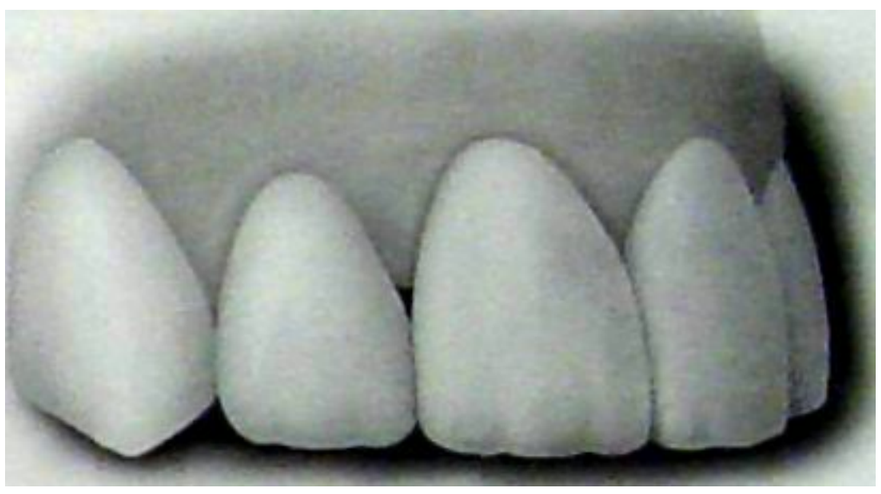


Fig. 24
A black triangle, due to a blunted papilla is present in the cervical embrasure between the central and the lateral.

IS THERE EXPOSED TOOTH STRUCTURE IN THE CERVICAL EMBRASURES THAT COMPROMISES THE CASE?

Tooth material should not be exposed in the cervical embrasure area. This may require lingual extension during preparation of the cervical, interproximal area. Such preparation has been described as an "elbow" or "dog's leg*.



Fig-25
Visible tooth structure & margin in the ***cenial*** *embrasure on the mesial of the right canine*

Before Treatment

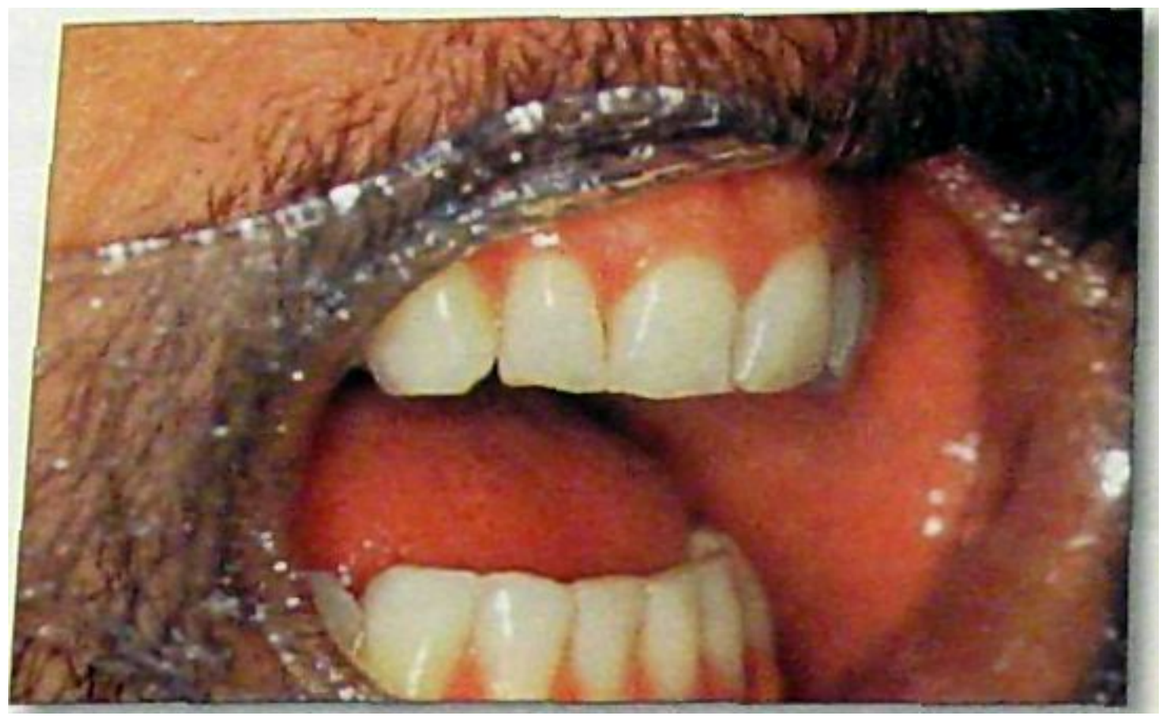
ORVICAL EMBRASURES
& SHADE SELECTION

- *Tooth material* should nor be *exposed in* rhe *cervical* embrasure area.
- TTie *darkness of the* oral cavity should *not be visible between the gingiva & the* contact area.

The *papillae* should be *pointed, not* blunted.

TTiese reeth *are monochromatic.*

Three planes of contour are absent.



Before Treatment

After Proper Treatment

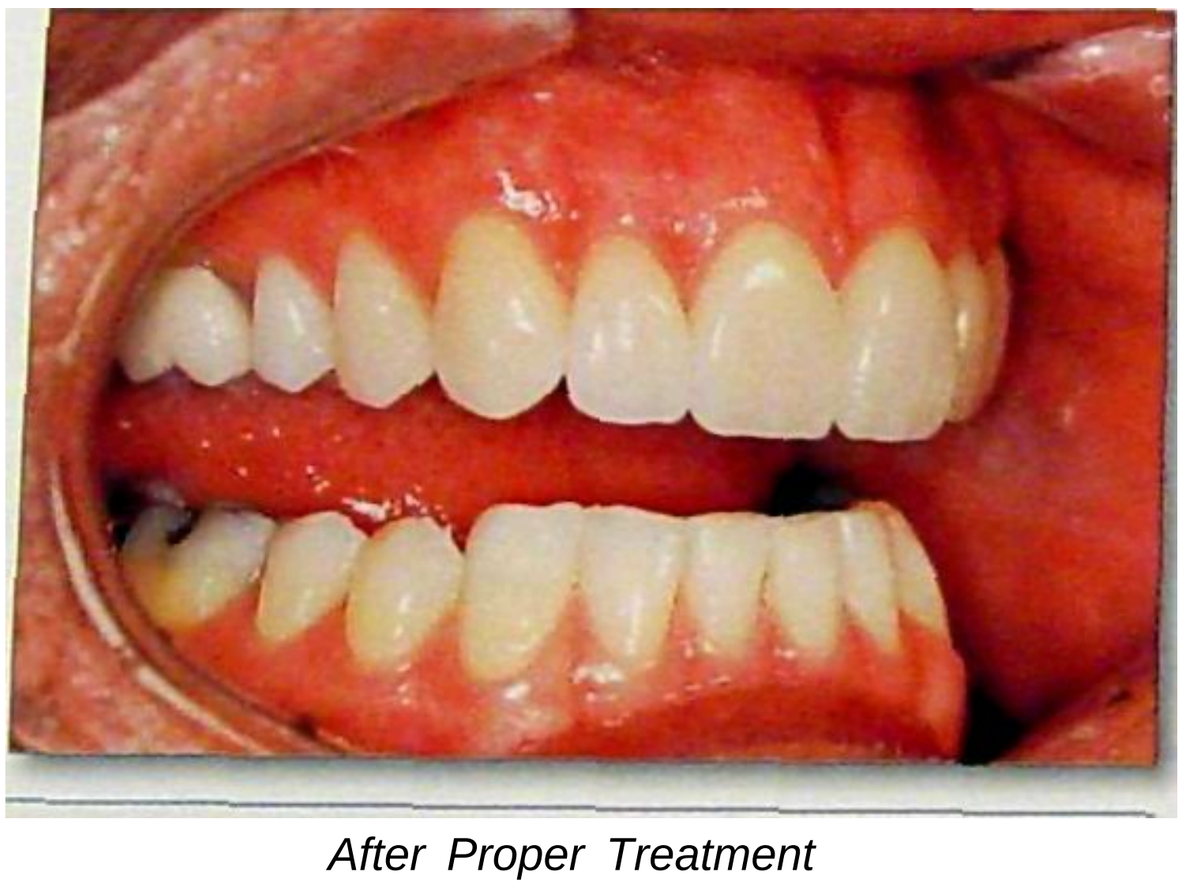
CERVICAL EMBRASURES
& SHADE SELECTION

- Excellent emergence profile and cervical embrasure form contribute to ihe superb tissue health.
- The *papillae* are pointed. There are no black Iriangles and no toulh structure \s visible.

Excellent color gradient is present vvilhin each resloraiion. Furthermore ihe canine has more chroma than the lateral.

The gingival area is rich in chroma but me restoration is still bright.

Three planes of labial contour are clearly evident.



After Proper Treatment

ARETHECERVICALEMBRASURESPROPER}

ARE n.\Rk TRIAKGIES PRESENT IS THE CERVICALEMBRASURE}

*ISTHEREEXPOSEDTOOTHSTRUCTURE*Iff *THECERVICALEMBRASURE}*



improper Treatment

Improper Treatment

CERVICAL EMBRASURES

- Tooth structure is visible in the interproximal The papilla is blunted in these areas.
- Presence of lubricants, walanis or even saliva such as at the interproximal oi 1*7 and 6 hinders proper evaluation and will be viewed negatively.



Improper Treatment

Improper Treatment

CERVICAL EMBRASURES

- In the gingival embrasure between the central & lateral, exposed tooth structure and a blunted papilla are present. Often these problems are accompanied by a black triangle.



Improper Treatment

Improper Treatment

EMERGENCE PROFILE

- The interproximal emergence profile of the maxillary right lateral and the labial emergence profile of the maxillary left lateral are not natural.
- Overall poor contour is evident.
- Occlusal issues need to be addressed.

Improper Treatment

Accreditation Criteria Using indirect Cases

Before Treatment

CFBVJCAL EMBRASURES

. TTic p-ipilla bcriiwn the centrals is blunted Th.s S , « i to the distance of the apical port.on of *the contact* area from the height of bone.

. *The darkness of* the oral *cavity is* visible in the eingtval embrasure between the centrats.

The *gingival levels* of *the centrals &* la1Mb are appropriate and [he certwls M too short.



Before Treatment

After Proper Treatment

CERVtCAL EMBRASURES

- NaturaJ *incfeal* Jranslucency, *a* hint of mammelons and (he presence of *an* unobtrusive halo impart a most life Tike character lo these restorations.
- The photo angles and framing of these pictures is not ideal bul they still allowed proper evaluation *oi* the work.
- Since (he contact *area* has been moved apically, the dark *inan^le* has disappeared & the papilla is pointed.
- The gingival *level* of the laterals is *no* longer apical to that of the centrals.



After Proper Treatment

Improper Treatment

LABIAL ANATOMY

- No anatomy is visible on the facial surface.
- All the surfaces are too rounded.
- The incisal translucency proceeds across in an unnatural straight line.



Improper Treatment

MARGIN PLACEMENT & DESIGN

h margin phcement -ind *design*
Are *ihe margins visible!*

The healthy gingival sulcus is shallow and can be anywhere from 0.5mm to 1.0mm deep on the facial of anterior teeth. Researchers found that gingival inflammation is related to the level of the crown margin below the gingival crest[1] Therefore, wherever possible, the margins should be at lhe height of gingiva or not more than 0.5mm apical to it. The restoration margin must maintain a distance from the alveolar crest that respects the biological width; otherwise gingival recession or pocket formation and periodontal disease may ensue[3]. Margin design will vary depending on the materials prescribed.

Margins can be supra-gingival but they should be closed and invisible-

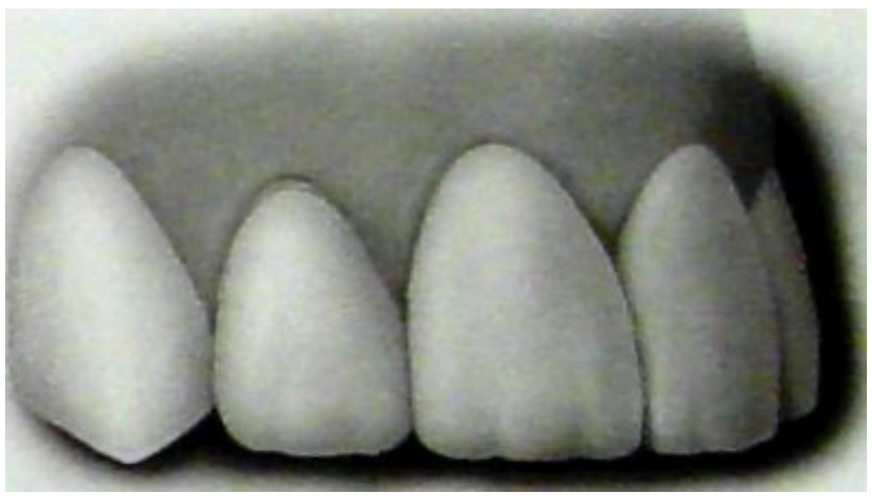


Fig. 26
Visible tooth structure & margin on the right lateral

In the interproximal area the margin should extend far enough towards the lingual so that it is not visible. Such preparation when it avoids breaking the contact has been described as an "elbow" or [M]dog's leg". Conversely, there are some clinicians who prefer to break through the contact area and have the finish margin on the lingual rather than at the interproximal.

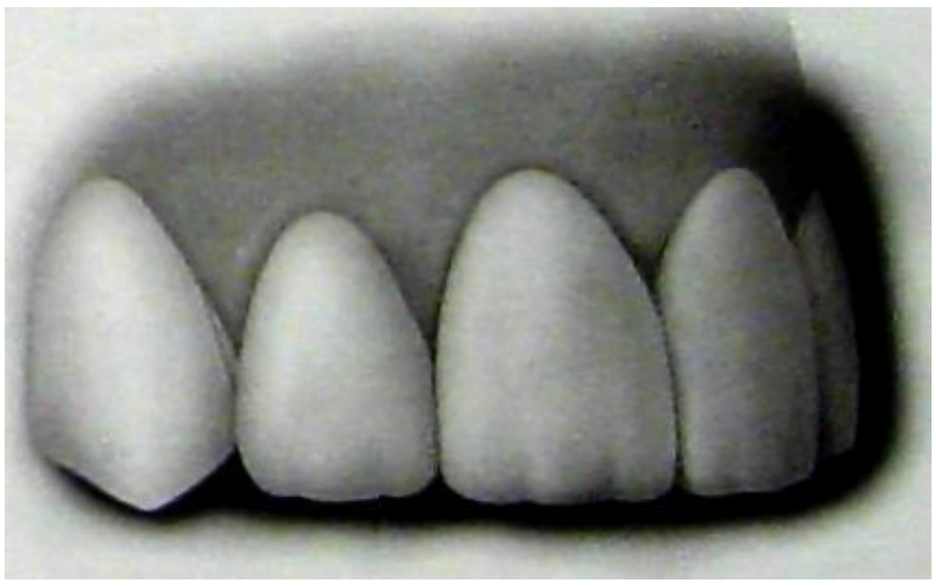


Fig. 27
Visible tooth structure & margin in the cervical embrasure on the mesial of the canine

Before Treatment

PFRIODONTAL HEALTH

- Pbrioetonifll health must *he* evident *at* completion of treatment.
- *Margin* placemen! & design must be such thai tooth structure is not visible & periodontal health is present.

Emergence profile must be natural.



Before Treatment

After Proper Treatment

MARGIN PLACEMENT & DESIGN

* ExcelJen[periodontal health is evident.

- Margins and tooth siruclure are not visible-
- Emergence profiles are ideal.

* The labia/ conlour clearly exhibits ihree planes.

[1] Labial anatomy is present.



After *Proper Treatment*

ISTHEEMEKCESCEPROFILEHATURALF

*ARE THERE THREE PIAHES FOR THE LABIAL COKTOUK**

IS THE PERIODONTAL HEALTH OPTIMAL?

ISTHELABTATANATOMYAPPROPRIATE}

ARE THE MARGINS VISIBLE?



improper Treatment

Improper Treatment

CHOICE OF MATERIALS
& SHOW THROUGH

IMPROPER RESTORATION

- Margins are visible,
- Opaque lutinft material visible at the ftingival margin of the canine, laieral and central.
- Show through of underlying tooth structure.



Improper Treatment

Improper Treatment

MARGIN PLACEMENT, DESIGN,
& CERVICAL EMBRASURES

IMPROPER RESTORATION

- Margins are visible and short of their preparation.
- Exposed tooth structure is present in the cervical embrasure.
- Papillae are blunted.

CHOICE OF MATERIALS

is the choice oi technique and material appropriate for the case?

Have both function and cosmetics been considered in the choice of treatment?

Has the underlying tooth color been properly managed to allow for an optimal cosmetic resultl

Choice of material, from luting cement to the type of porcelain used, must be based on specific, justifiable requirements of each case.

The requirements of strength and esthetics can be accommodated through the proper choice of materials for our restorations.

The right choice of materials can avoid "show through" of tooth structure and in the case of diastema closure, the right materials can hide the darkness of the oral cavity.

ACCREDITATION CRITERIA
USING ANTERIOR BRIDGE CASES

Before Treatment

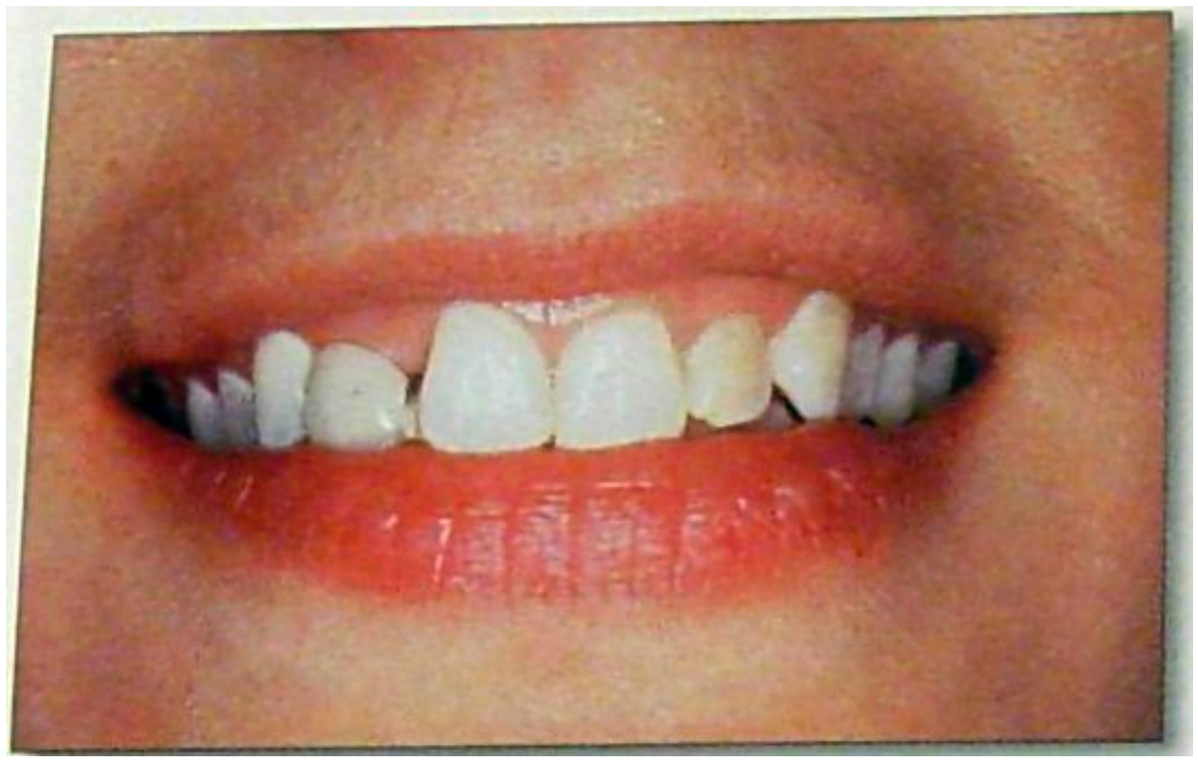
GINGIVAL CONTOUR *& SHAPE*

- The *gingival* shape *&* height *relating to* centrals should *be* symmetrical and *can be* even with the*canines-*

i The midline In this case Is canted *&* the axial fnc/inalron Is *incorrect*

The pontic JS *ioo* wide.

Contralateral teeth lack symmetry.



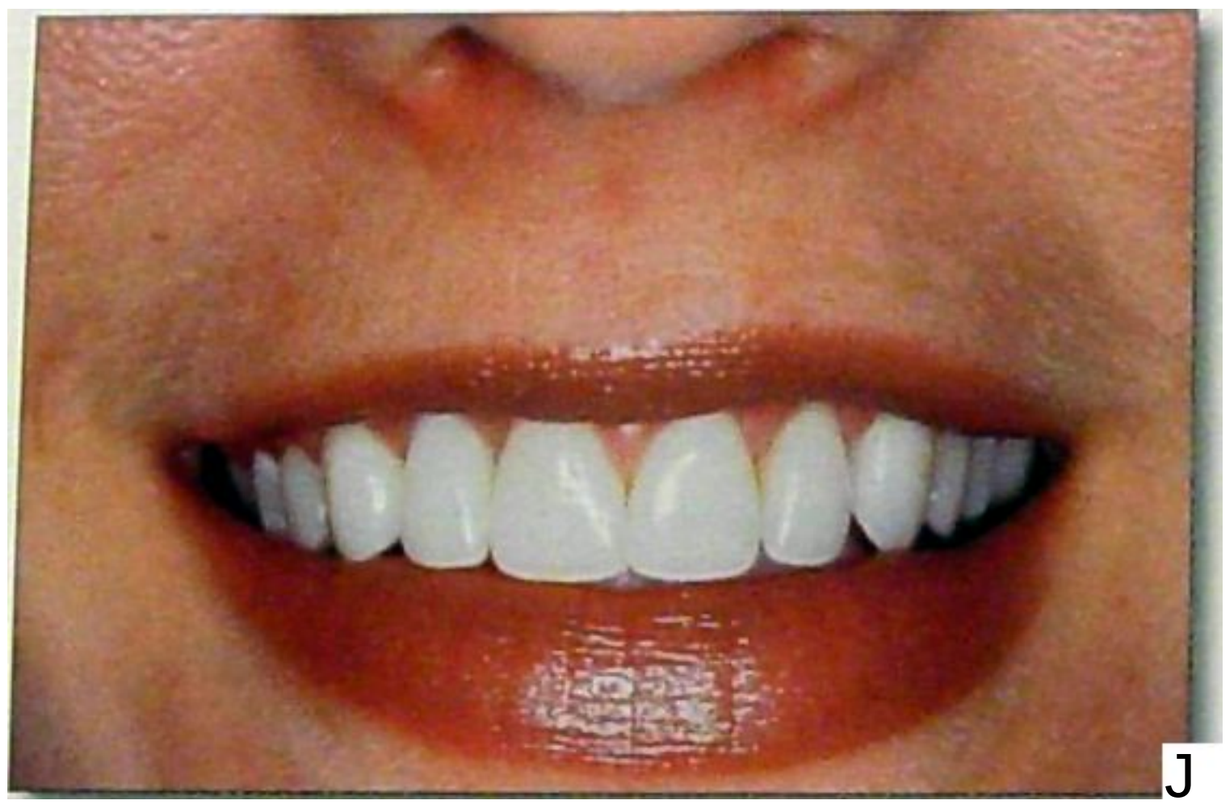
Before*Treatment*

After Proper Treatment

SYMMETRY OF CONTRALATERAL TEETH

- Gingival recontouring has facilitated improvement *in* proportion and axial inclination of the incisors.
- Principles of Golden Proportion are evident.
- Symmetry of contralateral teeth has been improved.

' Buccal corridor has been properly treated.



J

After Proper Treatment

Improper Treatment

BUCCAL CORRIDOR

- Black triangles as well as blunted papillae such as between the centrals and the left central and lateral are visible.
- The higher value of **the** six restored teeth accentuates the low value of the untreated posteriors and makes it seem as if there is a problem with the buccal corridor.



Improper Treatment

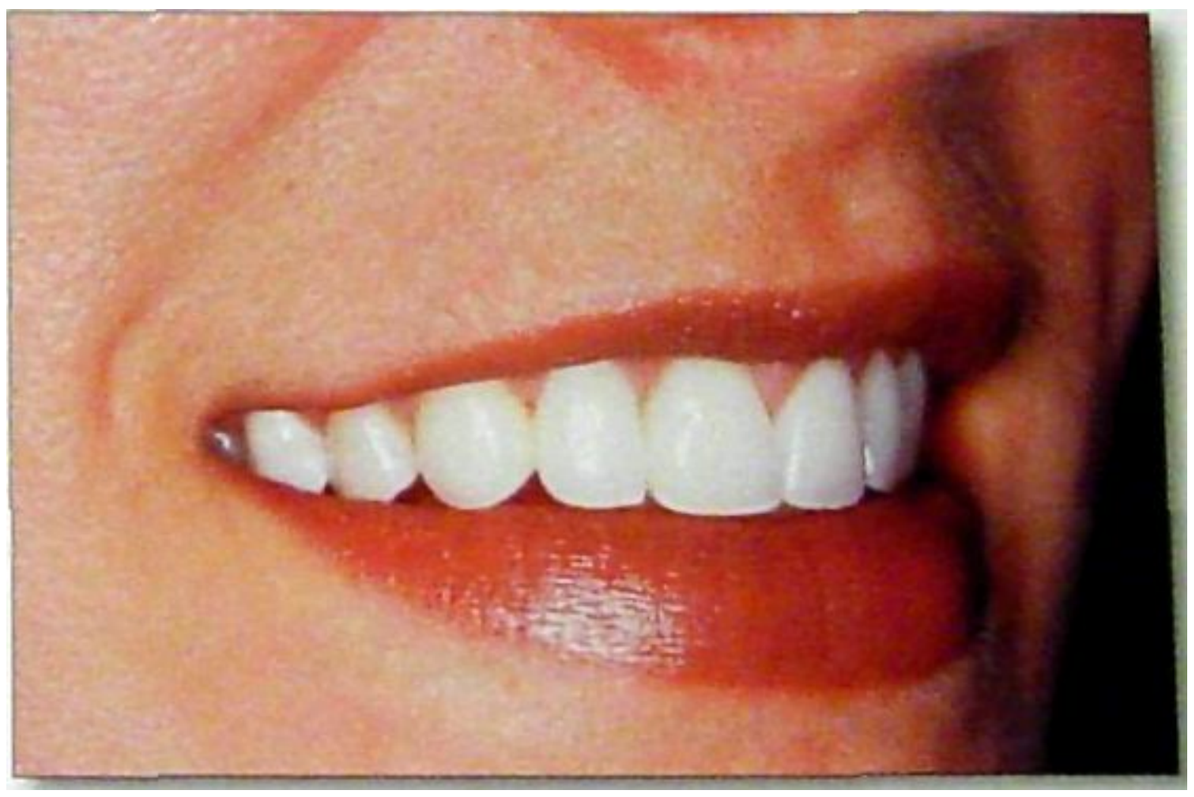


Before Treatment

Before Treatment

AXIAL INCLINATION

- Gingival levels are incorrect.
- The pontic is too wide.
- The axial inclination of the canine & lateral is wrong.



After Proper Treatment

After Proper Treatment

AXIAL INCLINATION

- Improved overall smile line and better incisal edge placement particularly of the lateral is clearly evident-
- Incisal embrasures have been properly treated.
- The pontic width has been corrected.
- The axial inclination of the lateral & canine seems more pleasing.

IS THE *AXIAL MCLINATIQH APPRQPK1ATE?*

tS THE *INURFRQMMAL CONTACT OR* ***COMHEC7OX*** **PROPER IN** ***LENGTH AND POSlWQNt***

THECERVICAL **EMBRASURES** ***PROPER?***

NO DARK THlASGLESt

GINGIVAL CONTOUR SHAPE AND POSITION

Is gi'nghji architecture appropriate (in all views) and in harmony with smile design!

Should gingival reconfouring, shaping and/or augmentation have bevn done?

The cervical gingiva! fierghf (position or level) *of the* centrals should be symmetrical. It can also match that *of the* canines- *It is* acceptable for the laterals *to* display the same (Fig. 29) gingival *level.* However, the resultant smile may be *too* uniform *and it is* preferable to exhibit a rise *and hit in* the soft *tissue* by having ihe gingival contour over (lie laterals located *towards the* incisal compared to ihe tissue *level on the* centrals and canines (Fig, 30). The leasl desirable gingival placement over the laterals \s for if 10 be apical to that of *ihe* centrals and/or canines (Fig. 31).

The gingival shape on the mandibular incisors and the maxillary laterals should exhibit a symmetrical half-oval or half-circular shape. The maxillary centrals and canines should exhibit a gingival shape that is more elliptical {Fig- 28a), Thus the gingival zenith (the most apical point of gingival tissue) is located distal to the longitudinal axis of the maxillary centrals and canines. The gingival zenith of the maxillary laterals and mandibular incisors should coincide with (heir longitudinal axis (Fig. 28b)'. Gingival contour, as compared to gingival shape, relates to a more three dimensional description of gingival topography.

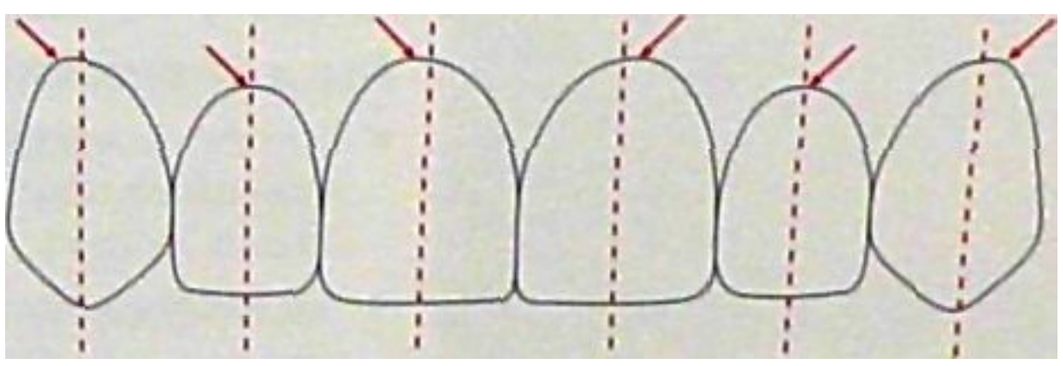


Fig-28
Gingival shape & zenith

The purpose of this diagram is to illustrate the relationship among gingival shape, zenith and an imaginary line through Ihe longitudinal axis of these teeth. Hie arrows point to the gingival zenith. Evaluation of the gingival shape and zenith can only be done at 90° to the *facia]* tooth surface. Therefore, for ease of illustration, all six of these anterior teeth are depicted showing, simultaneously, their entire facial surface. Obviously such tooth arrangement is not realistic due to the curvature of ihe maxillary arch.

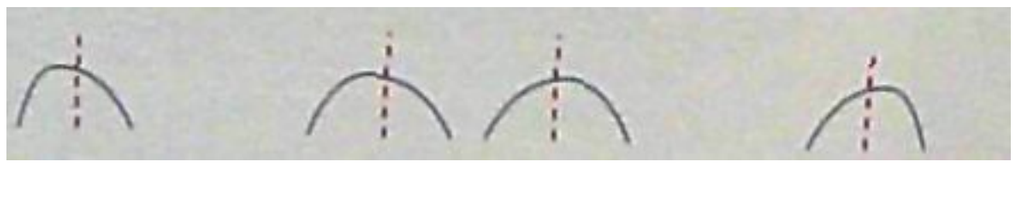


Fig.28a
Gingival shape of maxillary canines and centrals.





Fig.28b
Gingival shape of maxillary laterals and mandibular incisors

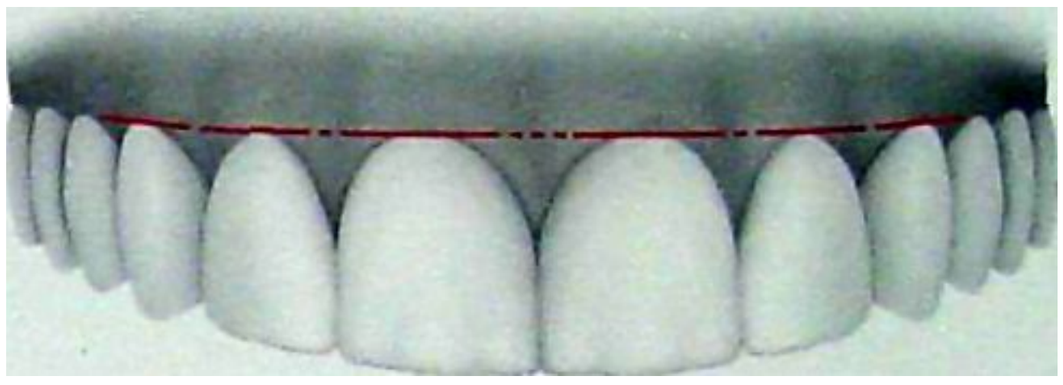


Fig. 29. Similar gingival height on the six anterior teeth is acceptable even it it ij not ideal.

Fig. 29
*Equal gingival **height** is acceptable*

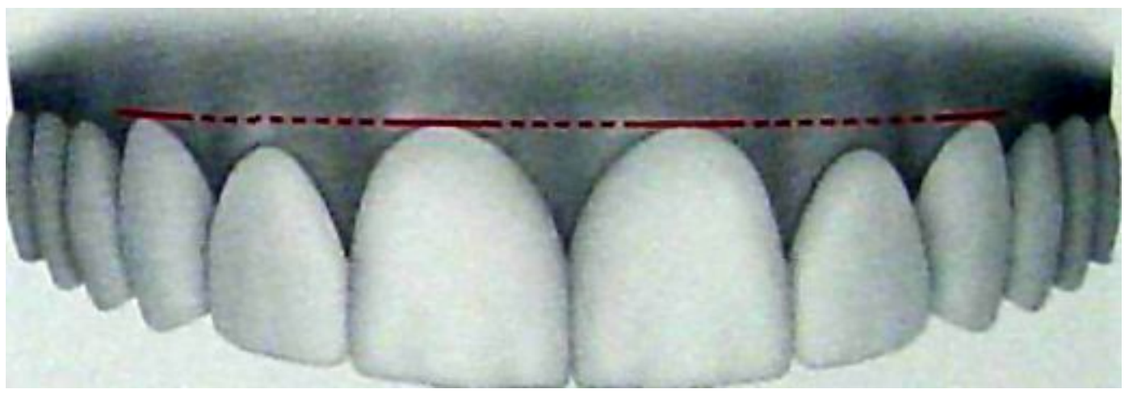


Fig. 30 demonstrates the position of the gingiva on the centrals and canines as being apical to that of the laterals and is considered closer to being ideal.

Fig. 30
Ideal gingival height relationship

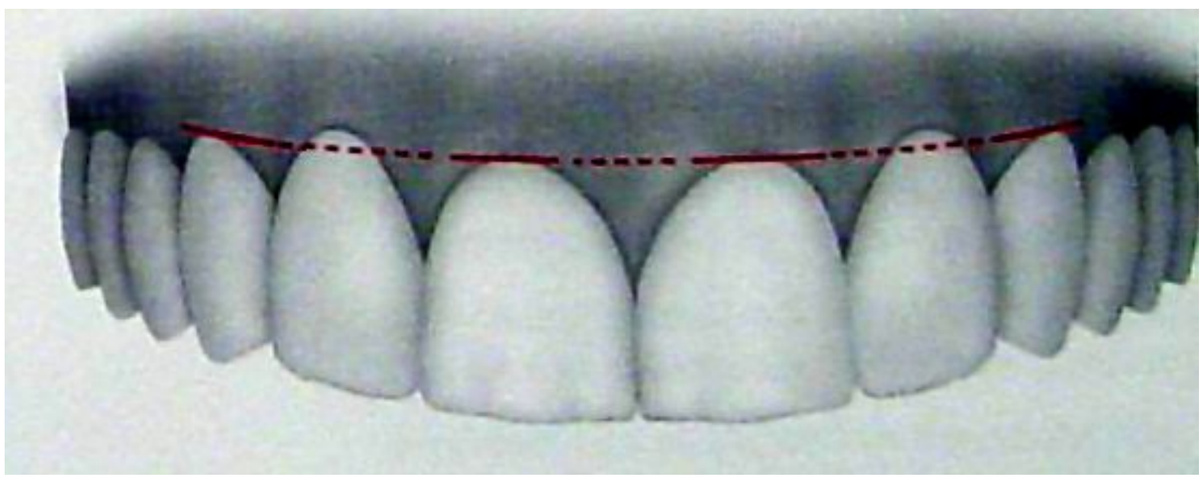


Fig. 31 - The position of the gingiva over the laterals is apical to that of the canines or central or both. This relationship in the height of gingiva is generally considered unattractive.

Fig. 31
Least desirable gingivnl height relationships

Before Treatment

StMMFTJttCAL CEKVfCAt/INCJSAL TOOTH *LENGTH*

- *Symmetry in length, width, & shape is* critical for *the* centra*ls.*

Uneven gingival levels & a canted *inc'tsal phne can he influencing factors.*

Ihe gingiva*l* zenith of *the* maxillary *cenlra*\s & *canines should* be located *distal to* therr *longitudinal a*

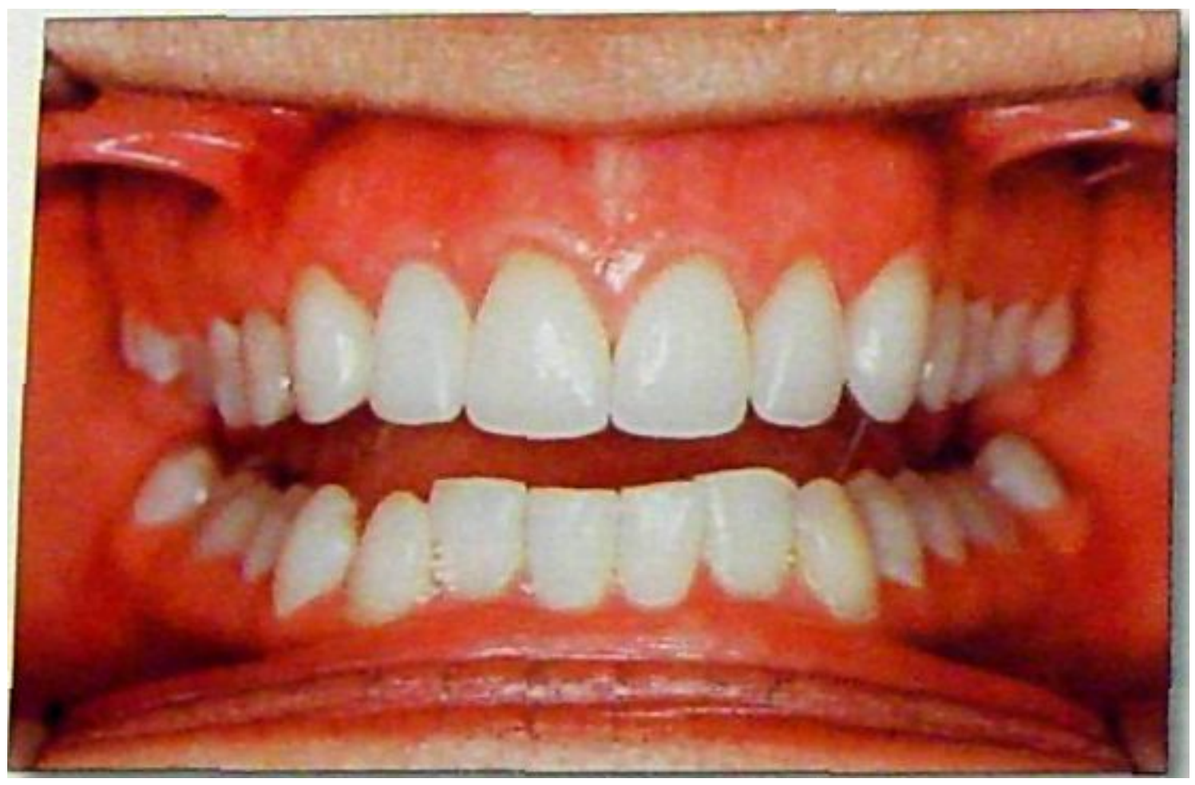


Before Treatment

After Proper Treatment

GINGIVAL CONTOUR, SHAPE & OVATE PONTIC DESIGN

- Utilization of an ovate pontic design has resulted *in* significant improvement.
- Gingival recontouring has permitted the establishment of symmetrical cervical-incisal tooth length from right *to* left.
- *y* Proper placement of the gingival zenith has contributed to improvement in the symmetry and axial inclination of the centrals.



After Proper Treatment

SYMMETRY

Is THE CERVICAt/lNCiSAt TOOIH LENGTH SYMMETRICAL FROM RIGHT TO LEFT?

AR£COKTRA-LATERAL TEETH PROPERLY ABKANCED FOR S1U ASD POStTtOSt

CONTOUR, SHAPE & POSITION

ISTHEGINGIVALARCHITECTUREAPPROPRIATE (IN ALL VIEWS), ASD TN HARMONY WITH SMILEDESIGN?

SHOULD GINGIVAL RECOSTOURING, SHAPING AND/OR AUGMENTATION HAV£ BEENDONE?

WAS AN OVATE PONTIC USED?



Improper Treatment

CERVICAL INCISAL TOOTH LENGTH

- Reverse smile line is present due lo the centrals being shorter than the canines ai Lhe incisal.
- The conirak, particularly the pontic, are loo long at the gingival when compared lo the canine*. CervicaUncisal tooth length of the centrals is not symmetrical.
- The pontic does not appear ovale,
- Opaque porcelain is visible especially on the mesial of the left lateral.

Improper Treatment



Improper Treatment

PERIODONTAL HEALTH
SHADE SELECTION

- Tissue inflammation is present.
- The value of the pontic is too low,
- The centrals are asymmetrical.

Improper Treatment

SYMMETRY

*Is the cervical/incisa! tooth length symmetrical from right to l*eft?

Are *contra-lateral teeth property* arranged for size *and position?*

Symmetrical length and width is most crucial for centrals. It becomes Less absolute the further we move away from the midline. Influencing factors may be uneven gingival levels and/or a canted incisal plane.

Unwillingness by patients to correct these conditions could relate to case selection depending on the severity of the problem.

Significant discrepancies in the size and position of contra-lateral teeth can distort other criteria such as golden proportion.

Symmetry us evaluated in the smile line, soft tissue, tooth length, width, shape and position.

Improper Treatment

SURFACE FINISH

. The centrals *display an unnatural surface* texture.

. The interproximal connector between 8 & 9 fs *long.*

i The *incisal embrasures* and *labial* anatomy *are* incorrect.



Improper Treatment

Improper Treatment

PERIODONTAL HEALTH

- The midline *is* canted in relation to the incisal plane.
- Periodontal **health** fs not optimal.
- The pontic does not appear ovate.



Improper Treatment



Before Treatment

Before Treatment

GINGIVAL CONTOUR SHAPE & POSITION

- The pontic is too short & too wide- Ridge augmentation procedures would be advantageous,
- The gingival zenith 01 the canine (and central) should be disul lo its longitudinal a*is.
- The gingival zenith of the lateral should be the same as its longitudinal axis.



After *Proper Treatment*

After Proper Treatment

OVATE PONTIC & EMERGENCE PROFILE

- Excellent use of an ovate pontic design combined with proper site preparation has resulted in a correct emergence profile and the creation or papillae.
- The canine abutment was properly treated at both the incisal edge and the gingival zenith thereby improving its axial inclination.

OVATE PONTIC

Was an otate pontic selected!
Tissue *contour should be ideal in all views.*

In fixed partials, ovate pontics facilitate hygiene maintenance due to iheir bullet-shaped tissue surface. They enhance esthetics by making the prothesis mimic the eruption of a natural tooth from its surrounding gingiva. Often ridge augmentation procedures are required prior to preparation of the "socket" pontic site.

SHOUID GINGIVAL RECQNTOURINC, SHAPING AND/OK AUGMENTATIONHAVEBEENDONE?

WASANOVATEPONTICUSEDFORTHEBRIDGECASE}

ISTHEEMERGENCEPROFILENATURAL?

ISTHEAXIALT\CUNATLQNAPPROPRIATE?

Improper Treatment

LONG CONNECTORS

- *Low* value of Ihe pontic is evident.
- Long connectors are present & look unnatural.
- The axial inclination of ihe canine is not correct-ft *is* drsMlly inclined.



Improper Treatment

Improper Treatment

PERIODONTAL HEALTH

- Gingival embrasure between the canine and lateral is too closed and the various gingival levels are not in harmony. The margin is visible on the premolar.
- Tissue health is not present.
- " The pontic is not ovate. This case would have benefited from ridge augmentation.



Improper Treatment

IS THE INTERPROXIMAL CONTACT OR CONNECTOR PROPER IN LENGTH AND POSITION?

IS THE PERIODONTAL HEALTH OPTIMAL?

WAS AN OVATE PONTIC USED?

ARE THE MARGINS VISIBLE?

ACCREDITATION CRITERIA
RELATING TO *CASE* SELECTION, PHOTOGRAPHY,
AND MLSCELLANEOL/5 ISSUES

CASE SELECTION

Before Treatment

CASE SELECTION

- Cases *of tetracycline* staining can produce significant improvement but mosi often (ess than *idealized* results.



Before Treatment

After Treatment

CASE SELECTION

LUTING MATERIAL & SHOW THROUGH

- To *mask the* color of this dentition the operator had to use an opaque luting cement.
- The opaque cement is visible at the margins and there is sli'Jf some tooth show through.



After Treatment

IS CASE SEIFCTtQX APPROPRIATE TO ACHIEVE AS OPTIMAL RESULT IS ALL VIEWS?

IS THE CHOICE OF TECHNIQUE & MATERIAL APPROPRIATEFORTHECASE?

HAS THE USDERLYISC TOOTH COLOR BEEN PROPERLY MANAGED TO ALLOW FOR AN OFTtMAt COSMETIC RESULT?

IS THE CHOICE OF WTINC MATERIAL APPROPRIATE?



Before Treatment



After Treatment

Before Treatment

CASE SELECTION

- Cases with untreated, unfavorable occlusal forces and pronounced bnjxing habits will compromise any cosmetic treatment.

After Treatment

CASE SEIECTION
OCCLUSAL FORCES

- Occlusal factors must be addressed before cosmetic treatment is completed.

ARE OCCLUSAL FORCES
ANO IN HARMQSYt

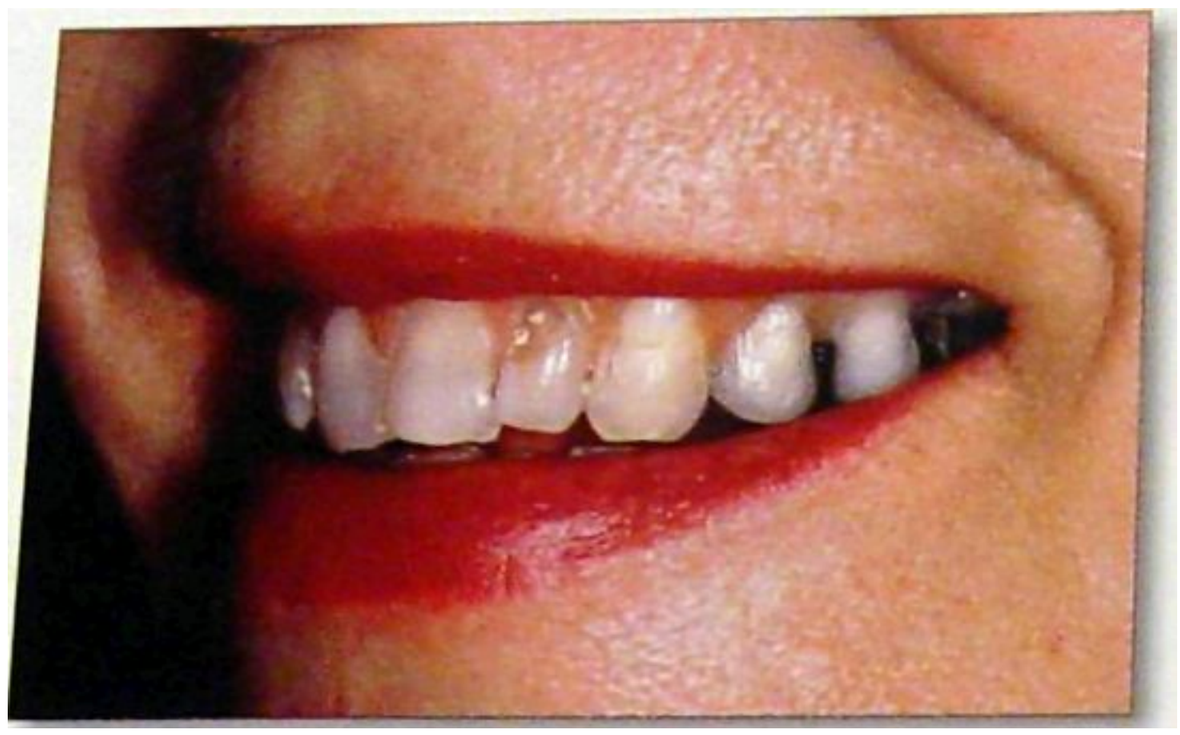
Hwt BOTH fuscrtON A COSMETICS BEEN CONSIDERED IS THE CHOICE Of

Accreditation Criteria Relating to Case Selection, Photogrjphy, & MiscelhnSm Issues

Before Treatment

CASE SELECTION

- *Completed treatment can look good in some* views.

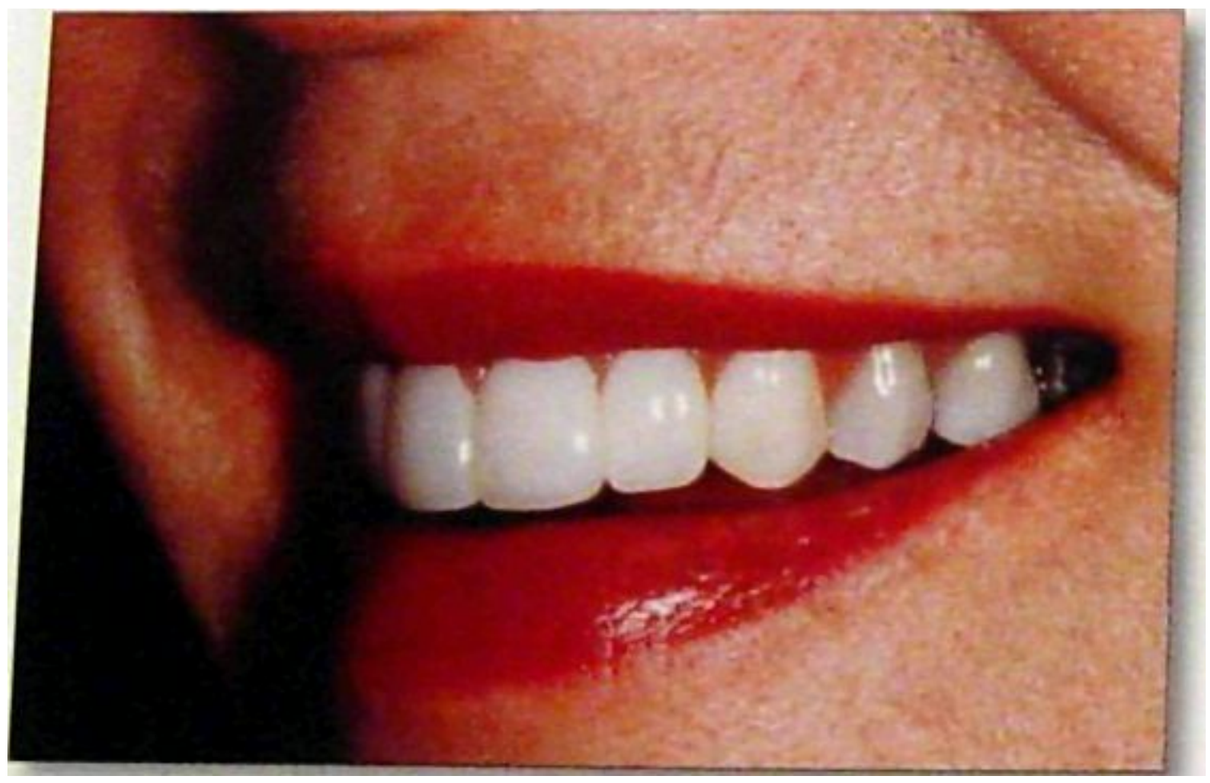


BeforeTreatment

After Treatment

CASE SELECTION

- Die retracted view must a/so be evaluated. (See [he same case *on* [he nexl page.J



After Treatment



Before Treatment

Before Treatment

CASE SELECTION

- Ca^es thai are complicated due to extreme factors or a multitude of problems do not lend themselves to idealized results.
- Even though ihe resin was handled in an appropriate manner, the operator was unable lo achieve optimal results in all views.



After Trentment

After Treatment

CASE SELECTION

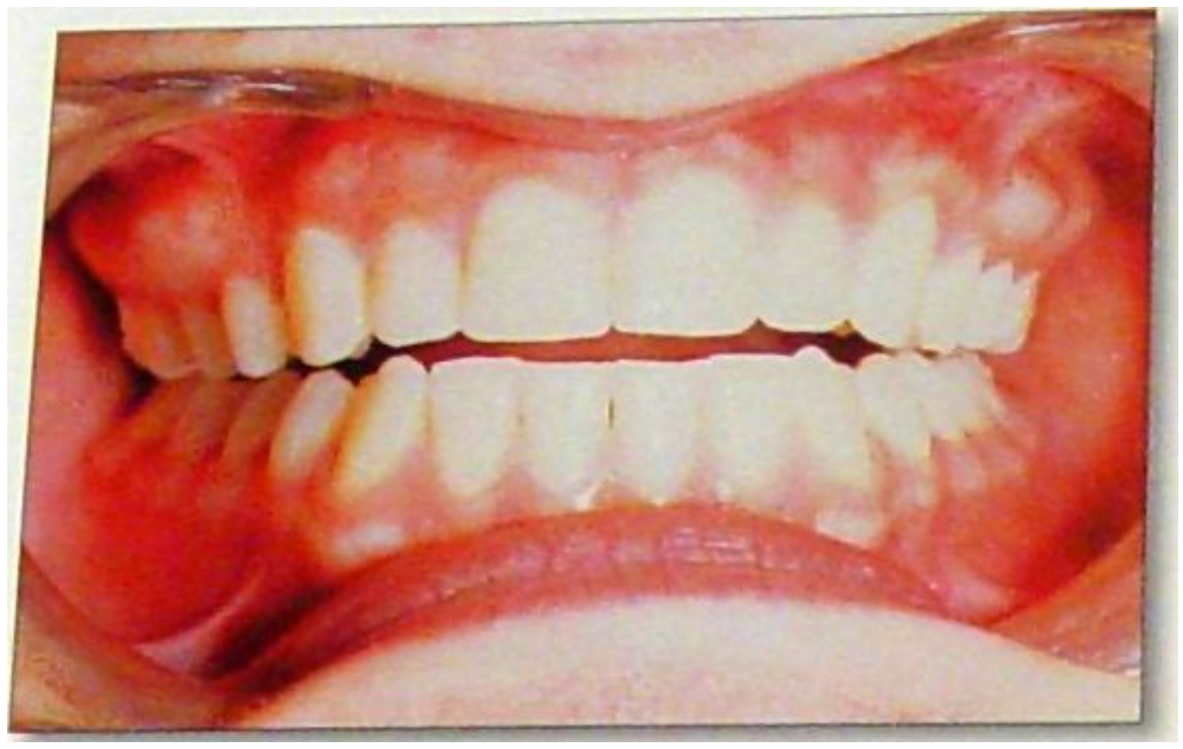
- Severe recession made it impossible to achieve ideal results a$ evidenced by the unnatural contour and axial inclination at the gingival third of the laterals.
- In this photograph it is apparent that the tissue is not healthy. In some cases additional healing time may be required ior the tissue to mature and exhibit a more optimal state of health.

IS CASE SHfCTfO-V *APPROPRIATE TO ACHI&EAS OPTIMAL RESULT* /N *ALL \tf\\$!*

FOR EXAMINATION PVRPOSIS IT ts APPROPRIATE TO CHOOSE CASES WHFJIF *MORE OPTIMAL RESULTSCANBE*

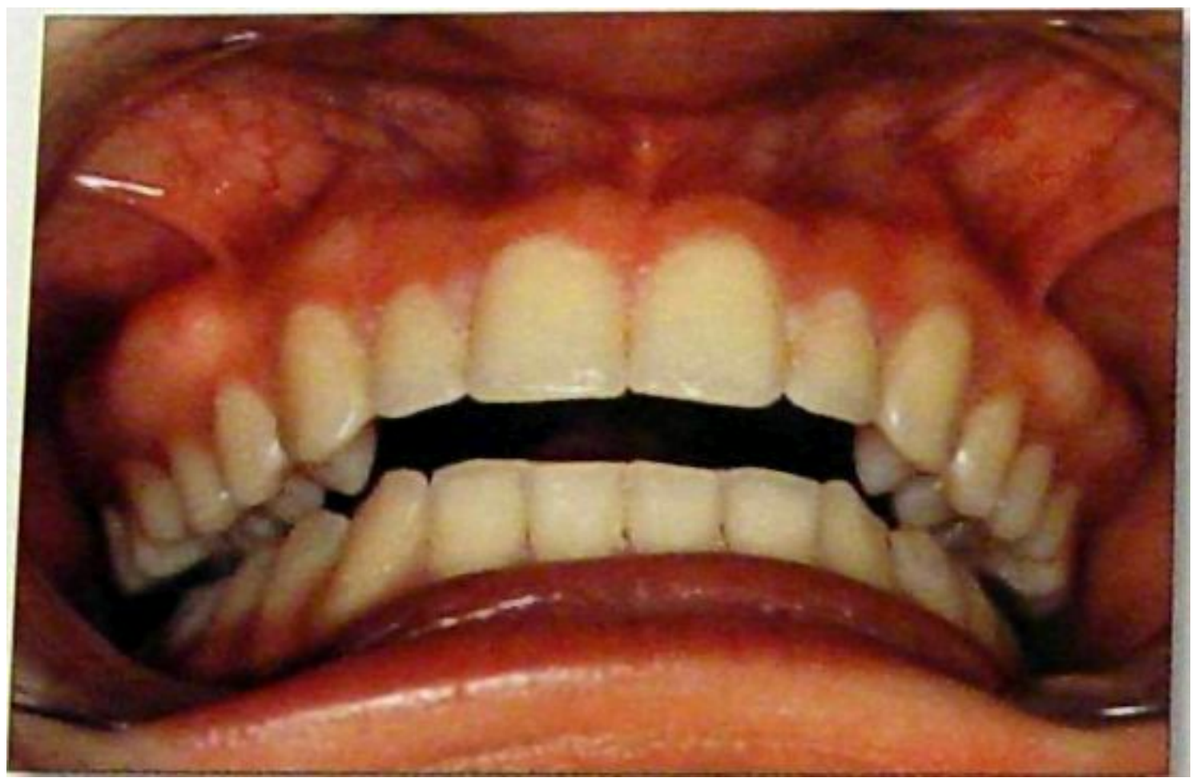
Exposure

- Accurate *evaluation* of any treatment depicted *in slides can* nol be *made without correct photographic* exposure. Overexposure makes *the evaluation of some* criteria, such as color, *impossible**



improper Angle

- Camera angulation upward or downward causes distortion and makes *evaluation of* some criteria /mpossib/e. A sleep upward angle can give the Impression *of* a reverse smile line.



Improper position of the flash

- if a poinf flash is positioned on the side rather than straight on, *it* can cause distortion and makes evaluation of some criteria impossible. Improper positioning of the flash made it seem as if there are problems with the buccal corridor in this case.



RtHR JO TMfAACD PAMPHtfT "A CUtDE TO DENIAL PHOTOGRAPHr" FOR PROPER PHOTOGRAPHIC PROTOCOL



Excessive Moisture

- Excessive moisture, whether it is saliva, lubricant or sealant makes it difficult tii not impossible) to evaluate texture, contact points, gingival embrasures and margins.



Excessive Moisture

- Excessive moisture makes accurate evaluation almost impossible and will be viewed negatively.

R.WIOCRAFHS ARE HECESSAR\ FOR INDIRECT CASES. THEY MUST SHOW AU BEQLIKED TREATMtKT BASED ON THE CAStS AS *DEFlSED BY THE PROTOCOL. LACK Of APPROPRIATE RslDtOGRAFHS OR EMDESCE OF DEFICIENCIES (OFES \URCt\S,* CEVtf,\T *8EWSD* ***MAY*** *BE CAUSE* ***fOR*** *FAILURE**

REFERENCES

I. C, *Fundamentals of Esthetics.* Chicago, *W:* Quintessence Publishing Co. 1990

2. *Goldstein* R.E., *Esthetics in Dentistry.* Philadelphia, *P^: IB.* Lrppincotl Co. 1976

3- *Chtche* Gerard *)., Pinauh* A., fs^ertts *of Anterior Fixed Prosthodontics.* Chicago, !I: Quintessence *Publishing* Co., 1994

4. LaVere Arthur M., Oenfr/rc? Tbort *Selection; An analysis of the natural maxillary central incisor compared to the length and width of the face. Pan* 1J, Prosthet Dent. *May* 1992, vof. 67, number 5, *pp* 661 -663

5. Kern, B.E., *Anthropometric Parameters of Tooth Selection.* J. Prosthet Dent. 1967;T7:43t

6. Touafi 0., Miara P., Nalhanson *D., Esthetic Dentistry and Ceramic Restorations. Martin Dunilz* 1999

7. Miller E.C, Boddcn W.R., Jamison H.C., *A Study of the Relationship of the Dental Midline to the Facial Midline. 1.* Prosthei Dent. 1979;41:657-660

Kokich Vincent, O., Jr., *Kiyak* Asuman, H., Shapiro Peter, A.: *Comparing the Perception of Dentists and Lay People to Altered Dental Esthetics.* J. Esthetic Denl. 11:311 -324, 1999

Kokich, VC, Spear, FM., Kokich, VO. *Maximizing anterior esthetics: An interdisciplinary approach:* Esthetics *ind Orthodontics, JA McNamara, Ed.,* f *Craniofacial* Growth Series, Center for Human Growth and Development, University of Michigan, Ann Arbor, 2001

TO, Levin El., *Dental Esthetics and the Colden Proportion.* J. Prosthet Dent. 1978;40:244

IK Riekelts R.M., *The Biologic Signifigance of the Divine Proportion and Fibonacci Series.* Am. j. Orthod. 1982;81:35

12. Lombardr R,E., *The Principles of Visual Perception and their Clinical Application to Denture Esthetics.].* Prosthei Dent. 1973;29:358

13. Kois*).* C, Vakay *RX*t *Relationships of the Periodontium to Impression Procedures.* Compendium of Continuing Education *in* Dentistry. August 2000A/ol. 21, No. 8/684-692

14. Pound E., *Personalized Denture Procedures.* Dentist's manual. Anaheim, California: DenarCorp. 1973

15. Dawson RE., *Evaluation Diagnosis and Treatment of Occlusal Problems.* St Lours Mo-CUMosby 1974

Dawson P.E., *Determining the determinants of occlusion, tnl* Ferrodont. Rest. Dent. 1983;6:9

Chiche Gerard J., *Smile Rejuvenation: A Methodic Approach.* Practical Periodontics and Aesthetic Dentistry. April 1993

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19, Newcomb C.M., *The Relationship Between the Location of Sublingual Crown Margins and Gingival Inflammation.* J. Periodontol 1974;45:15 J '

to ; I r n r *Ph siolc sic Di.....men5iOnS ofthe ^odontium Fundamental Restorative Dentistry.* J. Periodontol 1979;5Q:1O7

INDEX

Axial inclination.....j j# \2, JJ, I5t 17, 30. 44, 45, 51,
Buccal corridor.....^.....j j , 32. 33, 44, 58
Caseselection.....M.....54, 55, 56, 57
Central dominance.....|£, \yt 3^ 44
Cervical embrasure.....37, 38, 39, 40, 43, 44, 50
Choice of material.....26, 4X 54

Definitive incisal edge.....—,;.2I, 22
Embrasure
(seeCervicalembrasure,Incisafembrasure.Facialembrasure)
Emergence profile.....18, 20, 24, 3ft 39, 42
Excessivemoisture.....•.....39, 59
Exposed tooth structure.....37, 39, 41, 43
Facial embrasure.....2t, 23, 26
Gingival architecture.....15, 24, 40, 44, 45, 46, 47, 48,
Gingival zenith.....™.....15, 46, 4ft 51
Golden proportion.....16, \7t 33, 36, 44
Halo.....27,40
Hue.....25, 27, 30, 38
Incisal edge position.....ft T5, 2U 25r 45
Incisai embrasure.....T4, 15, 20f 26, 35, 45, 50

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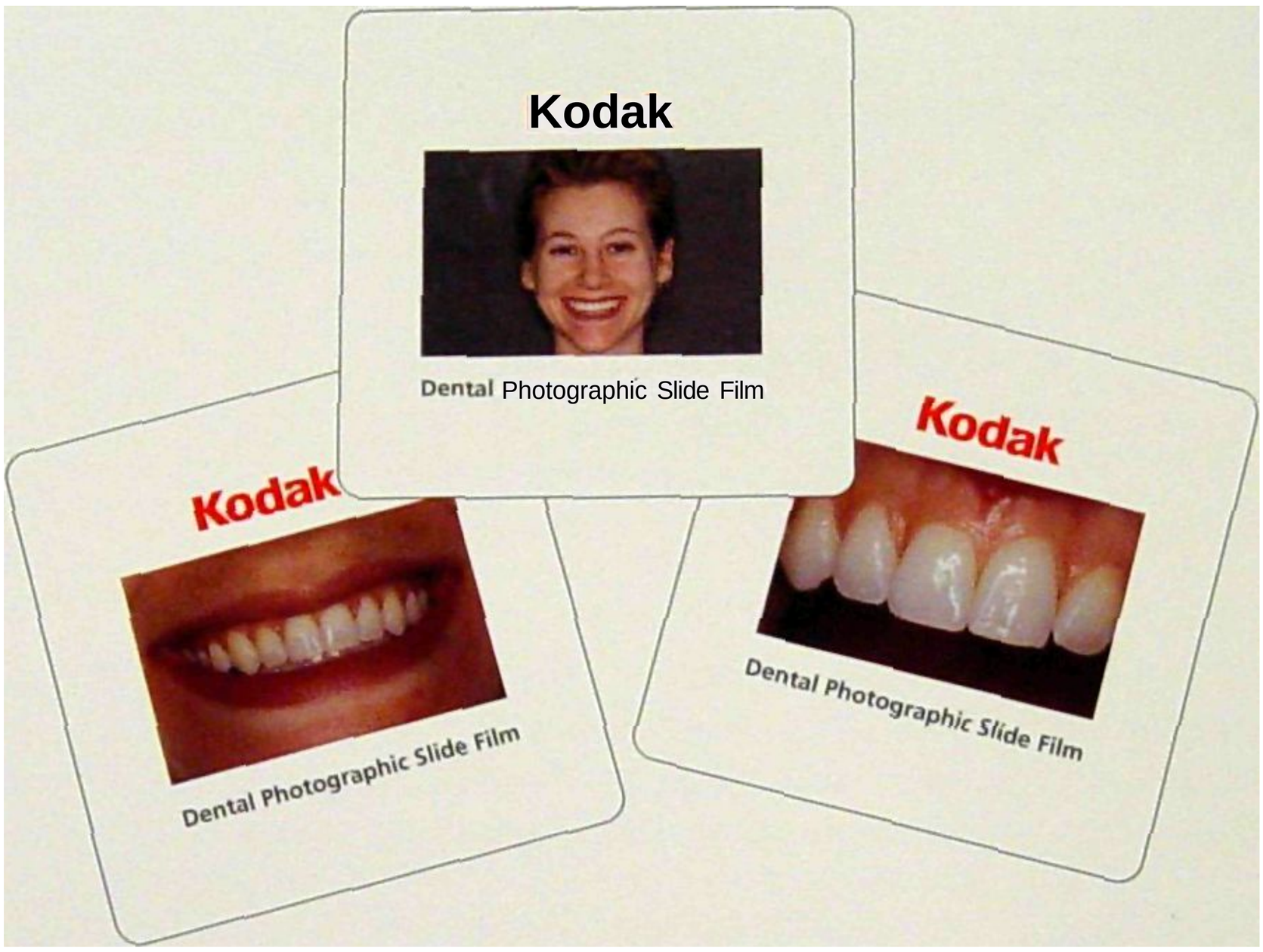
frans/ucency.....25, 26, 27, JO, 40
Interproximal connector.....45f 50, 52
Interproximal contact.....**.,*»»..15, 20, 2f, 26
Labial anatomy.....22, 23, 24, 26, 35, 4Qr 42, 48
Labial contour.....15, 34, 35, 38, 39, 42

Margin placement and design **n
Midline.....~..... ^JO
Opaque luting cement 43, 54
Opaque *porcelain*
Ovate pontic.....48, 49, 50, 51,52
Periodontal health.....17, J9, 20, 24, 38, 42, 49, 50, 52, 57
Proper size and position of contra-lateral teeth ...17, 26, 44, 48. 49
Proportion of centrals.....'6. '7, 33, 36, 44, 49

Reverse smile line ..8. 9, 12. 17, 33, 49
Show through ..25, 43, 54
Smile line -.....«.....*.....•.....B, 9, 12, 13. 17, 33, 49, 58
Surface polish and texture.....»,. -..- 35,50
Symmetry , 13, 17, 26, -W, 48.
snow
Translucency.....^, 26, 27, 30, 40

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Photographic Documentation And Evaluation in Cosmetic Dentistry



A Guide to Accreditation Photography

American Academy of Cosmetic Dentistry

A Guide to
Accreditation Photography

Acknowledgements

This manual was produced by the AACD Board of Governors, with the assistance of Eastman Kodak Company. The information included in the guide was compiled and edited by :

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The AACD Guide to Accreditation Photography has evolved over a period of years through the generous efforts of additional individuals associated with the AACD Photography Workshop. Special thanks to Dr. Bruce Singer, Dr. Corky Willhite, Dr. Brian LeSage, Dr. Linda Steel, and Dr. Jimmy Eubank for their significant contributions to the development of the workshop and manual prior to this publication.

This dental photography guide has been produced by the American Academy of Cosmetic Dentistry under the supervision oftheAACD Board of Governors. All materials contained herein are the sole property oj the AACD and may not be reproduced without the written permission of the American Academy of Cosmetic Dentistry* Board of Governors.*

All dental accreditation photographs originated on Kodak 35mm Dental Photographic Slide F

Introduction

What is AACD Accreditation?

In 1984 the American Academy of Cosmetic Dentistry was formed by a group of forward thinking individuals dedicated to continuing education in the rapidly evolving fields of dental materials and cosmetic dentistry. Within a short period of time, the AACD developed a credentialing process in cosmetic dentistry designated "Accreditation". As techniques and materials have developed, the Accreditation exam has continued to set a standard for clinical excellence. Successfully achieving Accredited status from the AACD requires dedication to continuing education, strict adherence to the protocol and a resolve to produce exceptional dentistry. The process of Accreditation is comprised of three successive tiers:

Written Examination
Clinical Case Submission
Oral Examination

Detailed information regarding the testing protocols for both Dentists and Laboratory Technicians may be obtained from the AACD Executive Office (800-543-9220) or the AACD web site (www.aacd.com). This guide is designed to define the photographic requirements for the clinical case submission aspect of the Accreditation examination.

Accreditation Photographic Documentation

The photographs in this manual represent the specific documentation required for the clinical case submission portion of the AACD Accreditation examination. Proper documentation is necessary for both self-critique and the examination process. It is advisable to use this guide as a companion to the [1] information available in the AACD Photography Workshop. The workshop is a mandatory part of the Accreditation process, and includes more detailed information regarding basic camera operation, photographic composition and film selection.

Educational Format of this Manual

This guide focuses on consistency of photographic views required for AACD Accreditation, but can be also be a valuable tool for establishing standardized documentation of dentistry outside of the AACD credentialing process. For appropriate documentation of clinical treatment not used for the Accreditation examination, additional views may be necessary. Cases submitted for Accreditation review should include only the required views in this manual, with the exception of the designated technique case- The addiLonal photographs required for the technique case and those required for Laboratory technician Accreditation are described in the AACD "Testing Protocol".

The guide is organized in the following manner:

- Description of Required views for AACD Dental Accreditation Clinical Case Submissions
- Detailed Explanation and examples of each clinical view
- Sample Photographs for documentation of Laboratory elements
- Examples of Common Photographic Errors

Required Views for Clinical Case Submissions

There arc 24 views required Tor all clinical case submissions. Of the 24 views, 12 should be taken before treatment and 12 alter treatment. Additional views arc required for the technique case and Laboratory Accreditation cases.

The slides are defined using four primary factors:

- Subject matter: framing and content (full, face, full smile, etc.)
- Retracted, Non-retracted and Mirror views
- Magnification of the view (1:10,1:2,1:1)
- Photographic angle: frontal, lateral, & occlusal views

View / Camera Angle / Magnification

Non-retracted Views

1. Natural Full Face - frontal angle- 1:10 magnification
2. Full Natural Smile-frontal angle- 1:2 magnification
3. Full Natural Smile- right lateral angle- 1:2 magnification
4- Full Smile - left lateral view - 1:2 magnification

Retracted Views (gingiva and incisal edges of all treated teeth clearly visible!

5« Upper and lower teeth slightly parted - frontal view - 1:2 magnification
6. Upper and lower teeth slightly parted - right lateral - 1:2 magnification
7. Upper and lower teeth slightly parted - left lateral - 1:2 magnification
8. Maxillary anterior in view only - frontal view - 1:1 magnification
9. Maxillary anterior in view only - right lateral - 1:1 magnification
10- Maxillary anterior in view only-left lateral- 1:1 magnification

Retracted Views using a Mirror

11. Maxillary arch -occlusal view- 1:2 magnification
12. Mandibular arch -occlusal view- 1:2 magnification

Note: All Wnra *slioukl he free of distractions ami debris- Any factors which compromise proper evaluation of clinical cases will be viewed negatively during the examination process. Refer to the common errors section for examples.*

Issues that apply to all photographs

Eliminatedebrisanddistractions

. *Saliv**. surface sea/ants and other forms *of excess* mo.s.ure

- Plaque, *cniculus*, *blood* and *food* debris
- Makeup, glove powder and/or *lipstick on teeth*
- *Excess* cement beyond margins of restorations

Use the proper camera angle and position relative to the subject

- framing a photograph from above or below the subject can alter the *perception of the plane* of (he teeth

Use a Uniform, Non-Distracting Background

- *The* background should be consistent from before to after
- *Certain* views do not require a background - sec photo examples
- A contrasiing device is optional for retracted I:J views. If one is employed, *it should* be *utilized* consistently throughout documentation of the case.

Position *the* camera *properly* to avoid tilting (canting) of the photograph

- Note that facial asymmetries should be reproduced in the photograph. Do not till (he camera to compensate for canted teeth or soft tissues
- ft may be necessary to reposition *the* patient to avoid leaning while exposing the photograph. This may require moving the patient from the dcnt.il chair to another chair or to a standing position.

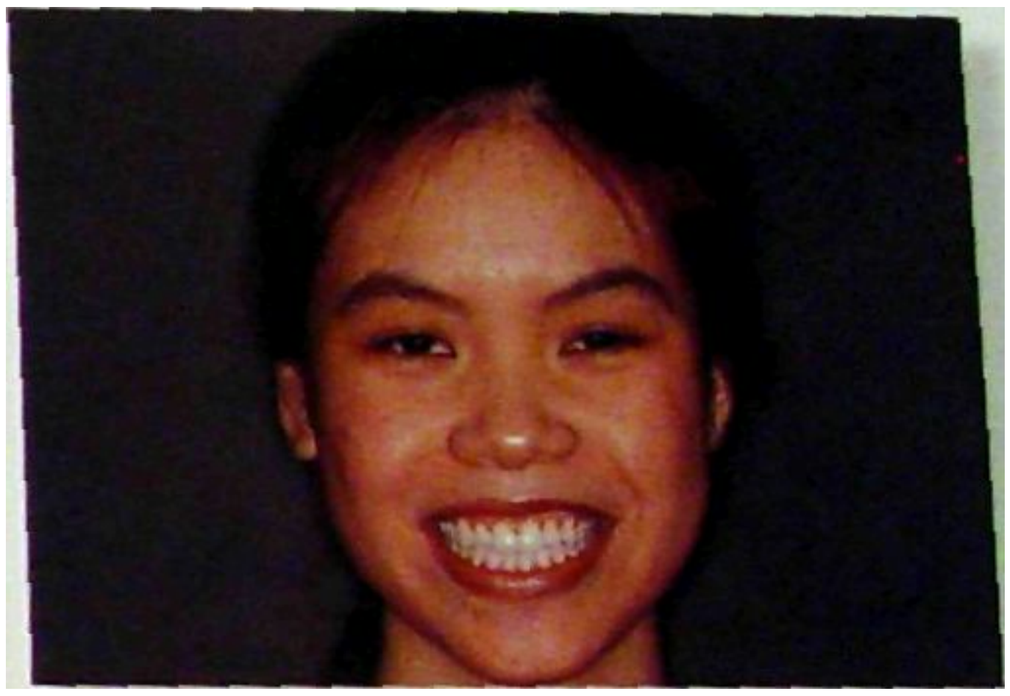
Use proper framing, exposure, and focus

The "common errors" section of the guide contains views of these types of concerns. Within the Dental Accreditation section, two models have been utilized for some views to highlight natural variations in display of dentition that may be apparent when standardized framing and magnification are used.

FULL FACE

FRONTAL VIEW
1: 1O MAGNIFICATION
NON-RETTRACTED





Horizontal Orientation only- do not turn camera for vertical orientation. If the photograph is framed with the chin near the lower border, the head should be in full view for most patients. With a 1:10 magnification, the patient's neck will probably be out of frame.

The patient should exhibit a full *natural* smile. Facial muscles should be relaxed.

The patients nose should be in the center of the photograph-

Use the mterpupillary line and vertical midline of the face to orient the camera. Do not use the lips or teeth to determine alignment as they are less reliable references for orientation.

Position the patient so that no shadowing is apparent on the background. Shadows usually indicate that the subject is too close to the background.

Use a uniform, non-distracting background.

Photograph should be taken directly in front of the patient- Avoid angulation problems that will affect the appearance of the incisal plane.

Issues that apply to all photographs

Eliminate debris and distractions

- Saliva, surface sealants and other forms of excess moisture
- Plaque, calculus, blood and food debris
- Makeup, glove powder and/or lipstick on teeth
- Excess cement beyond margins of restorations

Use the proper camera angle and position relative to the subject

- Framing a photograph from above or below the subject can alter the perception of the plane of (he teeth

Use a Uniform, Non-Distracting Background

- The background should be consistent from before to after
- Certain views do not require a background - see photo examples
- A contrasting device is optional for retracted l;l views. If one is employed, it should be utilized consistently throughout documentation of the case.

Position the camera properly to avoid tilting (canting) of the photograph

- Note that facial asymmetries should be reproduced in the photograph- Do not tilt the camera to compensate for canted teeth or soft tissues
- !t may be necessary to reposition the patient to avoid leaning while exposing the photograph. This may require moving the patient from the dental chair to another chair or to a standing position-

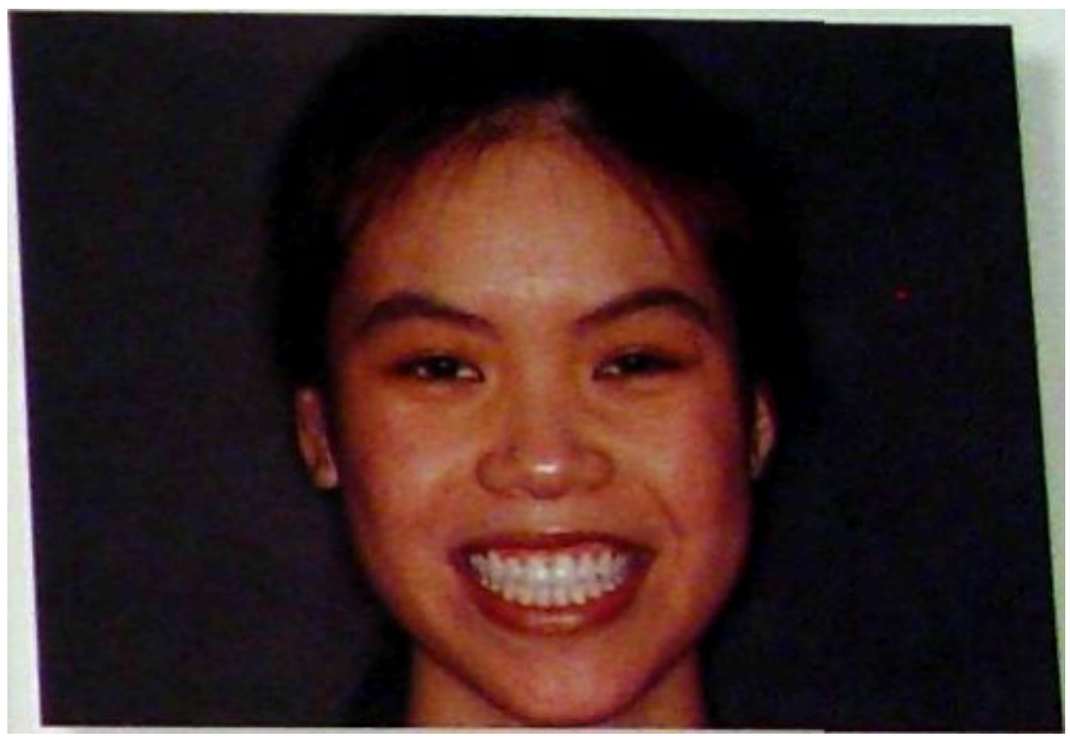
proper framing, exposure, and focus

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FULL FACE

FRONTAL VIEW
1: 1O MAGNIFICATION
NON-RETRACTED





Horizontal Orientation only - do not turn camera for vertical orientation- If the photograph is framed with the chin near the lower border$_t$ the head should be in full view for most patients. With a 1:10 magnification, the patient's neck will probably be out of frame.

The patient should exhibit a full *natural* smile. Facial muscles should be relaxed.

The patient's nose should be in the center of the photograph.

Use the interpupillary line and vertical midline of the face to orient the camera. Do not use the lips or teeth to determine alignment as they are less reliable references for orientation.

Position the patient so that no shadowing is apparent on the background. Shadows usually indicate that the subject is too close to the background.

Use a uniform, non-distracting background.

Photograph should be taken directly in front of the patient. Avoid angulation problems that will affect the appearance of the incisal pUne.

FULL SMILE

FRONTAL VIEW
1:2 MAGNIFICATION
NON-RETRACTED VIEW



An cxnittplf ot a broad intiiv with tttiriinul thipLiy of tower teeth



A more oval smile with greater display oflower teeth

>• Show a/////natural smile. Document the maximum amount of teeth and gingiva that the patient normally displays when laughing or broadly smiling. Facial muscles should appear relaxed,

>• The vertical center of the slide should he rhephiltrum of the upper lip.

>- The incisal plane of the upper teeth should be the horizontal midline of the photo. If the patient has a midline discrepancy, or a canted incisal plane as evident in the full face view, it should be duplicated in this view. *Do not* tilt the camera to compensate for cnntcd teeth.

*- The photo shuuld be taken directly in front of the patient.

>- Avoid improper camera angle* as it will distort appearance of the inrisal plane. The camera should be 90 degrees to the subject both horizontally and vertically to prevent the illusion of a canted or inverse incisal plane.

> Using a *1:2* magnification, the patient's lips should be completely in the frame. All teeih normally viewed in a full natural smile should be in the photo. Note that mandibular teeth may not be visible,

> Focus *on* the centrals and laterals. Proper depth of field will allow for the other visible teeth to be in focus.

^ No background *is* necessary for this view,

FULL SMILE

RIGHT AND LEFT LATERAL VIEWS
1:2 MAGNIFICATION
NON-RETRACTED VIEW



Very little gingival display
Greater dUpUiy of lower teeth



Greater lateral gingival dupLjy
Less display of lower teeth

Show a full natural smile. Document the maximum amount of teeth and gingiva that the patient normally displays. Facial muscles should appear relaxed.

Some background may be visible, if one is necessary* place the background on the contralateral side of the patient in a position that will not result in shadowing- It is possible that under certain conditions, the area behind the patient may appear black even without a background, based on flash position and depth of field.

The vertical midline of the photo should be the lateral incisor.

The horizontal midline of the photo should be the incisal plane$_T$ perpendicular to the vertical midline. Reproduce natural asymmetry.

Focus on the lateral incisor. Proper depth of field should allow for the other visible teeth to be in focus.

This is not a profile (sagittal) view. The contralateral central incisor, and possibly the contralateral lateral incisor and canine should be visible, based on arch size.

UPPER AND LOWER TEETH

FRONTAL VIEW
1:2 MAGNIFICATION
RETRACTED VIEW



Uvelphne ofocclusion
Photographisproperlyattuned



Upper teeth slightly flared and inverse smile line
Lower teeth tire level, photograph is properly d

- The upper and lower teeth should be slightly parted so lhat the incisal edges are visible. This allows for evaluation of incisaJ plane and incisal embrasures.

Show as much gingiva as possible. Position the retractors symmetrically to avoid the appearance of a earned photograph. Pull the retractors out and away from the teeth before exposing the photo-

Minimize the appearance of lips and retractors in the photograph-

Treated teeth and adjacent tissue must be completely and clearly visible. Gingival height and contour cannot be obscured.

The midline of the face should be used as the vertical midline of the photograph. The philtrum of the lip may me helpful, although retractors can cause some soft tissue distortion. Reproduce any asymmetry or canting of the teeth and incisal plane in the photo.

The horizontal midline of the photo should be the incisal plane of the upper teeth, and perpendicular to the vertical midline.

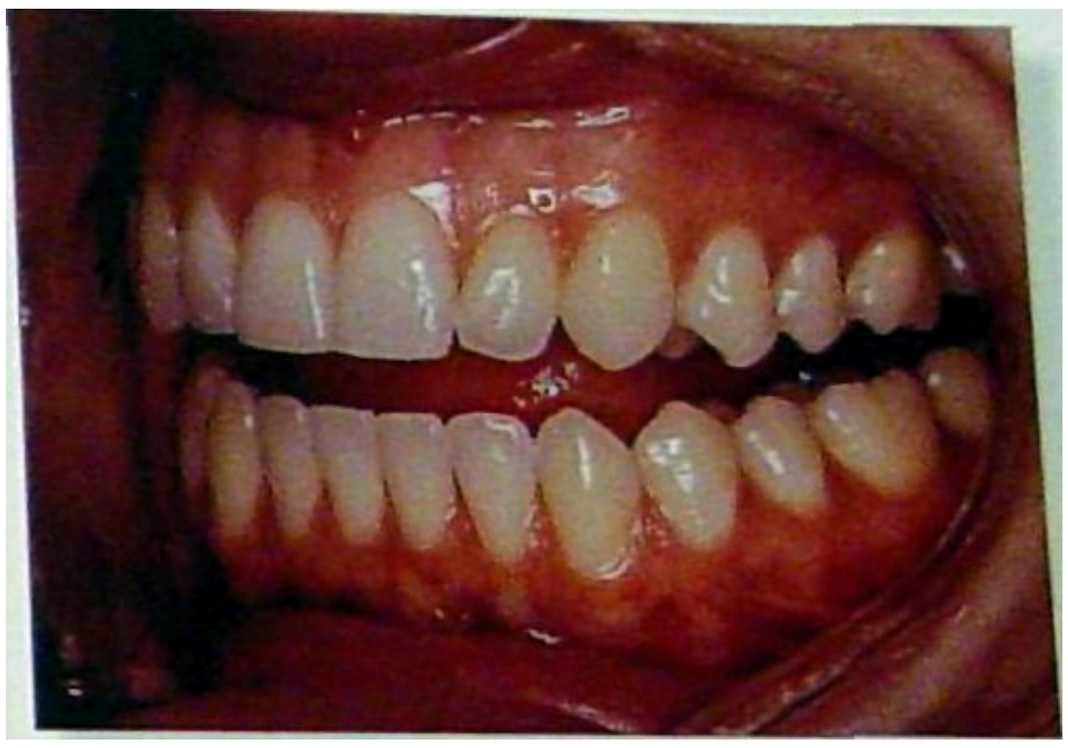
Position the camera directly in front and 90 degrees to the subject Avoid tilting of the camera and vertical camera angle problems (taking the photo from above or below the subject).

Using proper framing, exposure and depth of field. A 1:2 magnification should show both arches completely and in focus.

UPPER AND LOWER TEETH

RIGHT AND LEFT LATERAL VIEW
1:2 MAGNIFICATION
RETRACTED VIEW





A slight variation in occlusal separation is acceptable provided that the photograph are diagnostic for edge position and incisul embrasure form*

The upper and lower teeth should be slightly parted so that the incisal edges are visible. This allows for evaluation of incisal plane and incisal embrasures-
Show as much gingiva as possible. Rotate the retractors toward the photo side, while pulling the retractors out and away from the teeth.

Minimize the appearance of lips and retractors in the photograph.

Treated teeth and adjacent tissue must be completely and clearly visible. Gingival height and contour cannot be obscured.

This is not a profile (sagittal) view. The contralateral cental incisor, and possibly the contralateral lateral incisor and canine should be visible, based on arch size. Remember to center the photo on the lateral incisor.

The vertical midline of the photo should be the lateral incisor

The horizontal midline of the photo should be the incisal plane, perpendicular to the vertical midline. Reproduce natural asymmetry.

If retracted and framed properly, the contralateral cheek will obscure most of the background area.

MAXILLARY ANTERIOR VIEW

FRONTAL VIEW
1:1 MAGNIFICATION
RETRACTED VIEW





In this example, despite differences in tooth form, these photos exhibit similar framing and composition. In some instances, tissue display and the number of teeth visible will wry slightly from the photos above, whin using a 1:1 magnification.

The maxillary anterior leeth should be centered in the view using the midline and frenum as references to bisect the photo vertically. The philtrum will not be visible.

Horizontally, the midline of the photo should bisect the central incisors (do *not* use the incisal plane as the horizontal midline).

No retractors should be visible. The gingiva adjacent to the teeth in the frame should be clearly visible.

The opposing teeth should not be visible,

A contrasting device is optional. If used, place it *so* as not to create a shadow.

Take the photograph at 90 degrees to the subject and directly in front of the patient.

In a 1:1 view only 4 to 6 upper teeth should be in the frame.

MAXILLARY ANTERIOR VIEW

RIGHT AND LEFT LATERAL VIEW
1:1 MAGNIFICATION
RETRACTED VIEW





Lateral views without a awimsriug





Lateral views using a cotitmsting device

The lateral incisor should be mUered in the view to bisect the photo vertically.

Horizontally the midline of the photo should bisect the lateral incisor (do *not* use the incisal plane as the horizontal midline).

No retractors should be visible. The gingiva adjacent to the teeth in the frame should be clearly visible.

The opposing teeth should not be visible.

A contrasting device is optional. If used, place it so as not to create a shadow.

Take the photograph at 90 degrees to the facial of the lateral incisor

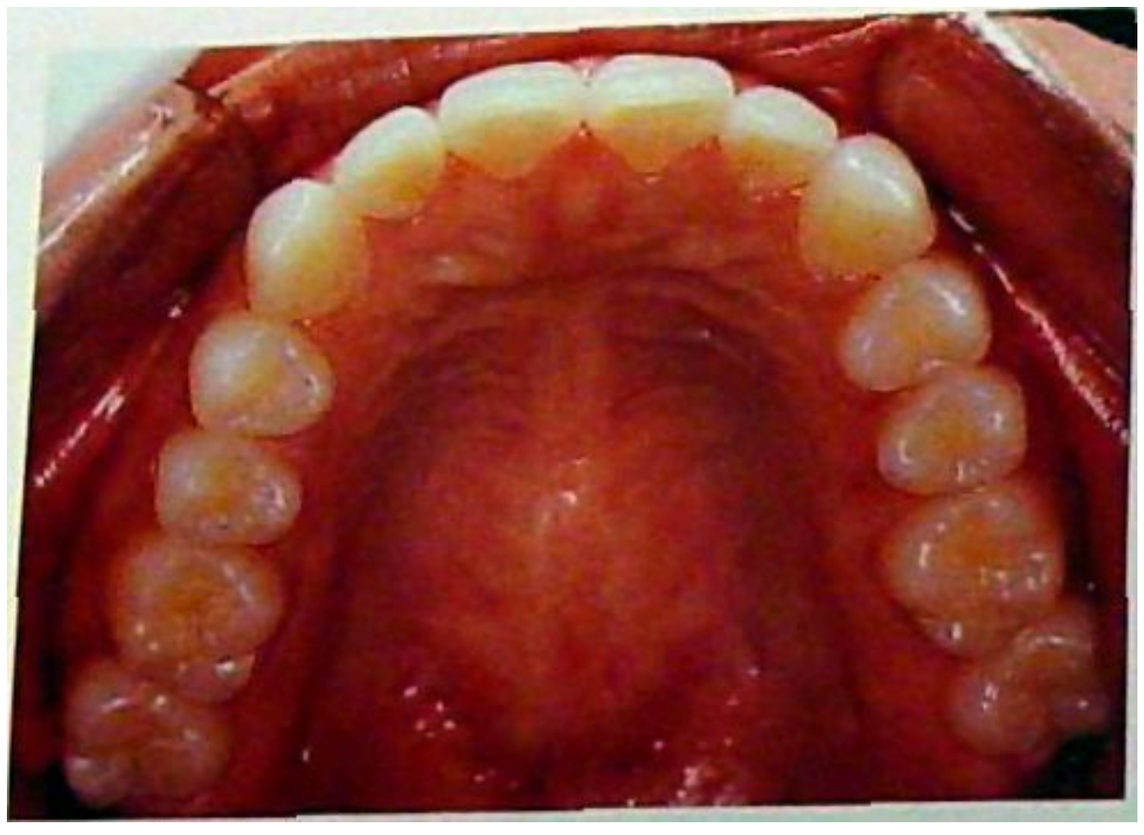
Rotate the photo side retractor toward the posterior and the contralateral retractor forward slightly- Both retractors should be pulled out and away from the teeth.

In a 1:1 view only 4 to 6 upper teeth should be in thy-ame.

n

MAXILLARY ARCH

OCCLUSAL VIEW
1-2 MAGNIFICATION
RETRACTED WITH MIRROR VIEW



- The occlusal view is *always* taken using a high quality mirror, resulting in a photograph of the reflected image,
- *Do not* attempt to take this photo without retractors - the soft tissue will collapse around the mirror and obstruct the view.

The facial surfaces of the centra! incisors should be visible near the edge of the photo.

Frame the photo so that mirror edges and lips are minimized. The patient's nose and unrefiected teeth should not be visible.

Eliminate fog on the mirror, A gentle stream of air will help.

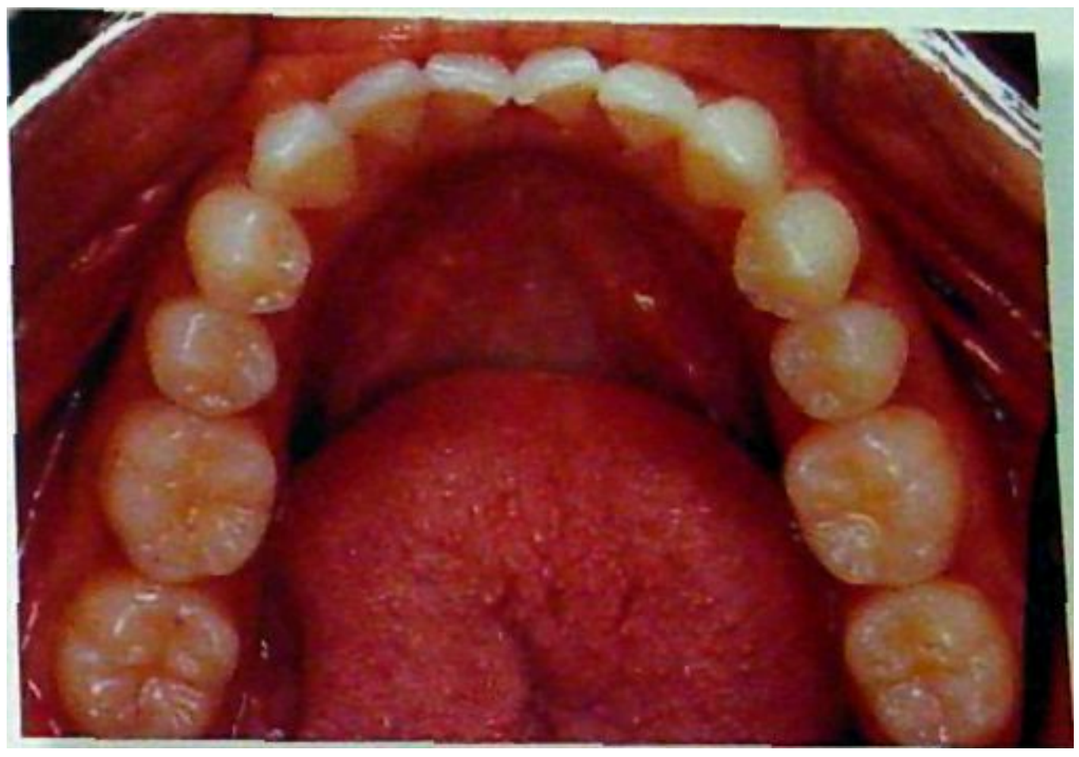
Take the photo at approximately 45 degrees to the mirror surface. The mirror placement should allow for the facial and lingual surfaces to be seen equally. A shallow photographic angle to the mirror will prevent proper documentation of facial & lingual embrasure form-

- Show as many teeth as possible. The photo should extend from the central incisors to the mesial of the second molars at minimum. The anterior teeth should always be clearly shown.
- The photo should clearly show the incisal edge position of the maxillary anterior teeth and the facial and lingual embrasures.

This photo can be taken from either in front of the patient (partially reclined) or directly behind the patient with the patient fully reclined.

MANDIBULAR ARCH

OCCLUSAL VIEW
1:2 MAGNIFICATION
RETRACTED WITH MIRROR VIEW



The occlusal view is *always* taken using a high quality mirror, resulting in a photograph of the reflected image. Do *not* attempt to take this photo without retractors - the soft tissue may obstruct the view.

The facial surfaces of the central incisors should be visible near the edge of the photo-

Frame the photo so that mirror edges and lips are minimized. The patienfs nose and unreflected teeth should not be visible,

Eliminate fog on the mirror. A gentle stream of air will help.

Take the photo at approximately 45 degrees to the mirror surface. The mirror placement should allow for the facial and lingual surfaces to be seen equally. A shallow photographic angle to the mirror will prevent proper documentation of facial & Ungual embrasure form-

Show as many teeth as possible. The photo should extend from the central incisors to the mesial of the second molars at minimum. The anterior teeth should always be clearly shown,

The photo should clearly show the incisal edge position of the mandibular anterior teeth and the facial and lingual embrasures.

This photo can be taken from either in front of the patient (partially reclined with head tilted back). Taking this photo from behind the patient is difficult and requires an inverted body position with the head tilted back.

The patient's tongue should not obscure the teeth. It will be helpful if the patient can move the tungue to the posterior It may also be possible to retr^ghe tongue the

Laboratory Technician Photography

The following is a sampling of photographs used to document dental laboratory procedures. Note that this is designed to show proper framing and photographic technique. Documentation of laboratory Accreditation cases will require photographs of additional technical steps using the same photographic format. Consult the Accreditation Testing Protocol for details.



StudyModelPhoto



ImpressionPhoto



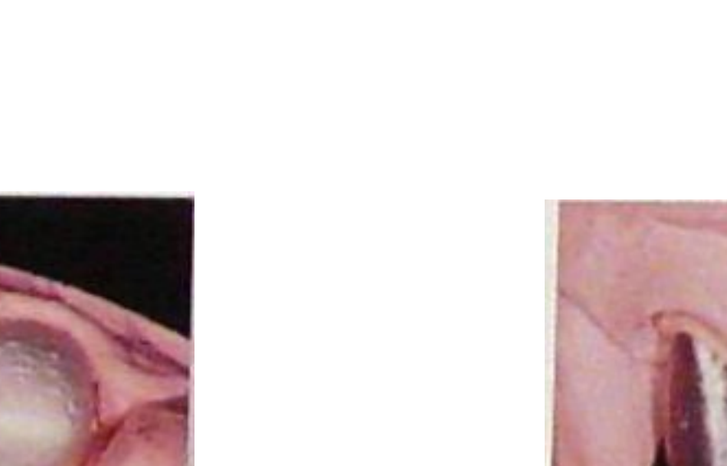
OcclusalView



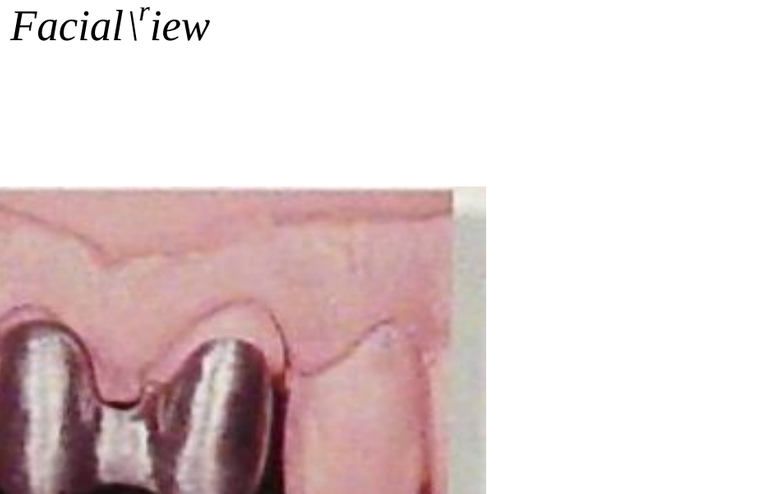
Facial\rview



LingualView



Internal View



Final View

Common Errors in Dental Photography



Canted Down and Ri&ht ExposureSatisfactory



Canted, Inferior Angle andUnderexposed



SuperiorAngleand Underexposed



Improved angle, but overexposed Color, Value and Texture not Diagnostic



Underexposed



Excessive Moisture between teeth and in the posterior



Fog on the posterior of the mirror obscures the teeth



Improper angle of flash Simulates negative space on opposite side (left side of photo is dark)



Improper angle of flash obscures contours and texture of teeth on opposite side (left side of photo) Also ctmttMfwtird ruHfb A f r



Improper angle ofphoto:
taken from a facial perspective
without a mirror
iil edge and lingual
surface not visible



Unrcflectcd teeth visible
at lower edge ofphoto
Edge ofmirror also visible



Poor framing ofphoto —
arch not centered, and
excessive extraoral area visible

Use of a contrasting device



Correct framing without
contrasting device



Properframing and placement
ofa contrasting device

Error views were made using a variety ofcamera systems amifilm. Proper accreditation documentation requires consistency ofcolor and exposure as shown in the required views section.