

# Creating aesthetic and functional transitional restorations

RAHUL DOSHI WILL

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AESTHETIC

RESTORATIONS

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The purpose of this article is to outline a simple system to achieve a functional occlusion and a predictable aesthetic rehabilitation with porcelain veneer techniques. It follows the fundamentals of smile design, tooth morphology, form and function.

## THE TEAM APPROACH

It is essential to coordinate the team in the diagnostic phase of any complete rehabilitation case.

The combination of knowledge and artistic skills of the dentist and the ceramist provides a predictable result.

The dentist's role is to understand the needs of the patient and formulate a plan that includes not only aesthetic considerations, but also occlusal, periodontal and functional requirements.

## THE PRINCIPLES OF SMILE DESIGN

In developing anterior restorations, specifically veneers and crowns, the dentist must determine the following important factors:

- The position of the incisal edge. This is determined by
  - Interior guidance to achieve posterior disclusion
  - The visible tooth height at rest position of lips and whilst smiling
  - The curvature of the lower lip should be parallel to the incisal edges of the upper teeth
- Phonetics:
  - i 'f' sound - the upper incisal edges should just embrace the



Figure 1: Preoperative model depicting discrepancies in midline, arch-form, golden proportion and gingival height



Figure 2: Measurement of tooth height using a Jeneric Pentron 'T' ruler

- The vermilion border of the lower lip
- ii 'e' sound - the upper incisal edge should be half way between the upper and lower lips
- iii 's' sound - can determine the correct vertical dimension and freeway space
- The width/length ratio of central incisors should be 75% - 80%
- The colour of the required restorations and the colour of the existing dentition/restorations; thus determining the thickness of the restoration, necessary tooth reduction and the choice of feldspathic or pressed ceramic
- The position of the teeth as per

- The Golden Proportion rule: an anterior photograph (a two dimensional image) should produce the width ratio between central incisor: lateral incisor: canine of 1.6: 1: 0.6
- The size and position of the centre line should be vertical, not canted and ideally in the midline
- The archform needs to be assessed for lingual or labial version of the teeth in comparison to the ideal curved archform
- The position of contact points and the position of the incisal embrasure areas progressively graduate cervically from the



**Figure 3: Pre-operative model depicting upper arch discrepancy**



**Figure 4: Occlusal view of corrected arch with diagnostic wax-ups**

anterior to the posterior teeth

- The size of embrasure areas progressively increase from the anterior to the posterior
- The axial alignment of the teeth should be converging to the midline at an angle of 5°
- The gingival height should be considered in the following way:

- The gingival height of the central incisor and the canine should be equal
- The gingival height of the lateral incisor should be 0.5 - 1mm shorter than the central incisor and canine
- The zenith should be slightly distal to the midline.

It is within this framework that the entire smile is developed. The best place to determine these variables is within the patient's mouth. The dentist's knowledge of smile design and the patient's guidance through functional movements

and speech will dictate the final position and appearance of the incisors.

The information that needs to be forwarded to the ceramist should include:

- A copy of the above pre-treatment diagnosis, and possible corrections (e.g. estimated

correction of centre line, gingival outline, tooth angulation and tooth shape and size)

- Full set of extraoral and intraoral photographs
- A preliminary set of upper and lower arch impressions
- Registration of the patient's occlusion in centric relation



**Figure 5: Pre-operative view**



**Figure 6: Transitional restorations after tooth preparations**



**Figure 7: Post-operative view**

- along with a facebow transfer
- Incisal index
- Precise measuring of length and width of teeth using a Jeneric Pentron 'T' ruler
- The patients specific wants and desires
- Phonetic observations

### THE CERAMIST

After receiving the impressions the ceramist will pour two sets of models using a high quality die stone (Die-keen Ivory). The first set is used for diagnosis and will be untouched as a 'before' model.

The second set is the working model for diagnostic wax up, to establish the position, size and shape of teeth in the ideal archform, with the correct anterior and canine guidance.

Once the diagnostic wax up is completed and approved, a matrix is fabricated with Sil-Tech putty. The matrix is used to fabricate the provisional restorations to the form and contour defined by the diagnostic wax up.

### THE MATERIALS

LuxaTemp is a self-curing composite based material that is smoothly dispersed from a cartridge delivery system.

LuxaFlow is a light-cured flowable composite that has colours that match Luxatemp closely so that repairs and



Figure 8: Pre-operative occlusal view



Figure 9: Occlusal view of transitional restorations showing improvement in arch-form



Figure 10: Luxatemp LuxaFlow, Luxatemp Glaze & Bond



Figure 11: Burs for shaping and finishing the transitional restorations (left to right): Brasseler 132F008 Red, 8392016 Red, 6844016 Green, 8368023 Red



Figure 12: Luxatemp is syringed into the matrix

additions are possible.

**THE TECHNIQUE**

- After tooth preparation, the teeth are cleaned with Chlorhexidine Gluconate (Consepsis, Ultradent Products Inc) and rinsed with water

- The matrix is then filled with Luxatemp placing the syringe tip deep within the matrix to avoid air bubbles. The matrix is seated on the teeth, then removed after 90 seconds. Whether the temporary remains on the teeth or in the matrix, it should be allowed to fully cure for almost



Figure 13: Luxatemp temporaries, after removal from the matrix

180 seconds before finishing and polishing

- After the cured temporary is removed from the matrix or the mouth, any gross excess material is trimmed with scissors or a bur and the internal aspect of the temporary wiped with alcohol
- A dentine bonding agent is placed on the inside of the temporary and protected from ambient light whilst teeth are being prepared
- All prepared teeth are spot etched in the middle third of the facial surface for 15-20 seconds and thereafter washed

- thoroughly. A thin layer of unfilled resin (e.g. Optibond 2FL) is placed on the teeth. (A primer or single component bonding system should not be used as the temporaries will be difficult to remove!)
- LuxaFlow is placed inside the temporary, which is then re-seated onto the teeth
- All excess LuxaFlow is removed with a disposable brush and cotton rolls, before finishing and polishing
- Each tooth is cured for 10 seconds with a plasma light or 30 seconds with a conventional



Figure 14: Pre-operative view



Figure 15: Luxatemp temporaries are placed back onto the teeth



Figure 16: Sand paper discs aid in shaping incisal edges and facial embrasures



Figure 17: Diamond bur used to shape facial embrasures

halogen light

- LuxaFlow can also be used to repair or add on to the temporaries. These areas should be micro-etched or roughened with a bur, and a bonding agent applied
- Finishing burs are used to finalise the marginal aspects (being careful not to disturb the tissue or alter the final preparations)
- Time is taken to accurately adjust the provisional restorations for an 'ideal smile' and correct occlusal form
- The final lustre is created with Luxaglaze Glaze and Bond. This is painted onto the temporary restorations, air dried and light cured.

#### THE ARTISTIC KEYS OF ADJUSTING PROVISIONAL RESTORATIONS

- Teeth must not be convex and bulbous
- Teeth should have a series of concavities and convexities
- Temporisation is about an illusion through the use of facial proximal line angles
- Central incisors must be symmetrical with a variance of no more than 0.2mm in any direction
- Central incisors are often dominant - they have three lobes
- Lateral incisors have tapered cervical necks and are often slightly tucked in behind the centrals. They have an S-shaped concavity on the distal side
- Canines should have two facial planes mesiodistally, where the distal face is not visible from an anterior view. The canine eminence is a dominant factor in lip support
- Premolars can be built out

at the junction of the incisal third and middle third of the tooth, into the buccal corridor to reduce lateral negative space.

Fabrication of the final restorations should begin only after occlusion has been checked, the provisional restorations are accepted to be comfortable and stable; and the patient is happy with the smile design. This typically requires the provisionals to be in place for a few days in order to obtain family support and suggestions as well as confirm phonetic control. An alginate and Polaroid photographs are taken for the technician at this review appointment.

#### CONCLUSION

Temporisation is an integral part of comprehensive treatment

involving smile design concepts. It represents the treatment phase that allows a dentist to be an artist. Temporary fabrication also provides proper communication for the laboratory, which directly affects the case. Eliminating as much of the guesswork as possible helps create a predictable result, and a happy smiling patient!

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Figure 18: Transitional restorations after shaping and finishing



Figure 19: Final restorations on working model



Figure 20: Pre-operative view



Figure 21: Transitional restorations after tooth preparation



Figure 22: Post-operative view



Figure 23: Pre-operative view

Rob Storrar, for helping me create beautiful smiles for all the

patients we have treated together. [PD](#)

Larry Rosenthal will be back in the UK for his exclusive six-day Aesthetic Advantage Hands-on Continuum in September and October (presently running in New York and Florida). If you are interested in placing your practice in the top 2% in the country then call 0800 371652 and speak to one of the Independent Seminars team



Figure 24: Post-operative view