How to build up a worn dentition with resin composite.

by Dr Mark Spencer

General outline.

Step 1  Take impressions. Prepare study models >>

Take impressions and pour up two sets of study models. Keep one set as a pre-treatment record and use the other for the wax-up of the proposed outline of the resin-composite build up.

Obtain a good centric-relationship record and mount both sets of study models on an articulator.

Step 2  Wax up one set of study models >>

On one set of study models use inlay wax to build up the proposed height and contour of the resin-composite.

Do the wax-up in the following order:
1. Upper anterior teeth.
2. Lower anterior teeth.
3. Lower posterior teeth.
4. Upper posterior teeth.

The height of the upper and lower anterior teeth wax-ups determines the amount of vertical dimension increase. The reason for this is given opposite. When building-up the lower posterior teeth preserve, as much as possible, the anterior-posterior curve (Curve of Spee) and the medio-lateral curve (Curve of Wilson).

The upper posterior teeth are waxed-up so they occlude with their lower counterparts.

‘The beauty of this approach is that it is practical, economical and does not cut off options for subsequent treatment if needed.’

about the author.....

Dr Mark Spencer is in private practice in Coffs Harbour, Australia.

He is a meticulous operator with an extensive knowledge of occlusion. He has been involved with undergraduate teaching at the University of Sydney.

Dr Spencer has been a long-time contributor to Dental Outlook and his articles are always extremely well received for their thoroughness and practicality.
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Step 2  **Wax up one set of study models (cont) >>**

1. Wax-up to new height and contour

2. Next wax up the lower posterior teeth followed by the upper posterior teeth. Keep the Curve of Spee and the Curve of Wilson.

3. First wax-up the upper anterior teeth to ideal length and contour then do the same with the lower anterior teeth.

4. Step 3  **Prepare moulds to transfer wax-up details to the mouth >>**

Once the wax-up has been completed on the study models, it is necessary to have the means to transfer these details to the mouth.

To do this moulds (or stents) are prepared for the upper and lower anterior teeth and for the lower posterior teeth.

**Moulds for the upper and lower anterior teeth:**
These moulds are made from vinyl siloxane putty (example product **Imprint 3 Penta Putty** - 3M Espe) and are prepared up to a few days before the treatment session.

**Technique:**
1. Prepare the putty and place it behind the upper anterior teeth on the model.
2. Extend the putty just over the incisal edges. This will give details of the palatal surfaces and provide a clear definition of where the incisal edges should finish in the resin-composite build up.
3. Repeat the same procedure for the lower anterior teeth.

**Moulds for the lower posterior teeth:**
Two moulds, one for each quadrant, are used for lower molar teeth. They are made from a 0.6 mm **Erkolen** thermoplastic sheet (Erkodent).

**Technique:**
1. Take an impression of the waxed-up lower model and pour up a new model.
2. Make a vacuum-formed tray on the new model using the **Erkolen** thermoplastic sheet.
3. Cut out the sections that will cover the posterior quadrant areas.
4. Using a heated no.11 scalpel blade, cut a hole through the tray in each molar occlusal-surface area. Cut a single hole for the premolar occlusal-surface areas.

Do not remove the cusp-tip sections because these are needed to determine the cusp heights in the resin-composite build up. Keep at least a ridge of plastic distal to the second premolar to give rigidity to the guide.

Source: www.dentaloutlook.com.au
How to build up a worn dentition with resin composite. (cont)

**Step 3**

Prepare moulds to transfer wax-up details to the mouth (cont) >>

**Above:** Polyvinyl siloxane putty is used as the mould for the upper and lower anterior teeth. The material is extended just over the incisal edges.

**Above:** Each of the two moulds for the lower posterior teeth has occlusal sections removed with a heated no.11 scalpel blade. The stone model used is poured up from an impression of the lower waxed-up model.

Example case.

Photograph of patient (right) and the patient’s study models (far right) showing the degree of tooth wear at the beginning of treatment.
How to build up a worn dentition with resin composite. (cont)

Example case. (cont)

Occlusal views of the upper and lower arches [right and far right] at the beginning of treatment.

Two pieces of Moyco wax doubled over were used rather than a large single piece to obtain a centric relationship record.

Using inlay wax the upper and lower teeth were built up to ideal aesthetics and contour. The sequence was upper anterior teeth > lower anterior teeth > lower posterior teeth > upper posterior teeth.

Polyvinyl siloxane putty moulds were made of the upper anterior teeth and lower anterior teeth. Each mould was extended just over the incisal edges. The far right photograph shows the extent of the build-ups required in the mouth.

Source: www.dentaloutlook.com.au
How to build up a worn dentition with resin composite. (cont)

**Step 4**

In the mouth. Start with the upper anterior teeth >>

After etching and placement of a suitable etch-and-rinse dentine-bonding agent (example product Adper Single Bond 2 - 3M Espe) start placing a high-strength resin composite (example product Z250 - 3M Espe).

With the polyvinyl siloxane mould in place, initially build up alternate teeth. Then carry out the build ups on the remainder of the upper anterior teeth.

An incremental-placement technique is used throughout.

The mould provides the palatal contour, width and the incisal length.

On the labial aspect of each tooth extend the resin composite slightly beyond the enamel incisal edge (below).

This helps hide the junction between resin and tooth.

Leave the final aesthetic detailing with dentine and enamel layers until a subsequent visit.

**Step 5**

Move to the lower anterior teeth >>

Use the same procedure as with the upper anterior teeth.

Etch and place the dentine-bonding agent, place the mould and build up alternate teeth as with the upper teeth.

The lower teeth are small and the anterior surfaces of the build up are in contact with the palatal surfaces of the upper teeth. For this reason, a high-strength resin composite is used for all tooth surfaces.

There is no final aesthetic detailing with dentine and enamel layers as with the upper anterior teeth.

After completing this stage, it is often a convenient point to finish the initial visit.

**Step 6**

Build up the lower posterior teeth >>

Carry out the preparatory procedures as outlined above, then place the appropriate thermoplastic mould with the cut-out occlusal sections.

Place increments of resin composite to build up the general height and contour of the buccal and lingual cusps.

Do not try to build up the approximal marginal ridge areas.

This is done after the mould is removed and a matrix band is in place.

Sometimes it may be easier to use the mould to guide the build-up for every second tooth and then dispense with it.

The existing build-ups can then be used as a guide to contour and cusp height.

**Source:** www.dentaloutlook.com.au
How to build up a worn dentition with resin composite. (cont)

Example case. [cont]

Photograph showing the two moulds for the lower posterior teeth build-ups (right). They had been cut from a single vacuum-formed tray. Far right photograph shows a close up of the round, occlusal-surface sections removed.

Demonstration on the model showing how resin composite is placed incrementally in the mould to produce buccal and lingual walls (right). Resin-composite placement is facilitated if alternative teeth are restored as shown. (far right).

Build-ups are done first on the upper anterior teeth. This is followed by build-ups on the lower anterior teeth (right). Then the lower posterior teeth are built-up. (far right).

The upper posterior teeth are the last to be built-up (right). The aesthetic detailing of the upper anterior teeth is done at a subsequent visit. (far right).

Source: www.dentaloutlook.com.au
A splint covering the upper anterior teeth is constructed for night-time wear. (right and far right).

Example case. (cont)

General outline. (cont)

Step 7
Build up the upper posterior teeth >>

The build-up of the upper posterior teeth is done freehand. The build-ups are made to occlude with the restored lower teeth.

Check that the bite is not inadvertently opened by checking the occlusion after each upper posterior tooth is restored.

Step 8
Do final aesthetic detailing of the upper anterior teeth >>

At a subsequent visit carry out the aesthetic detailing of the upper anterior teeth. This involves placing dentine and enamel layers using one of the more polishable resin composites (example product Filtek Supreme - 3M Espe).

The labial surface of each tooth is etched and a dentine-bonding agent applied (example product Adper Single Bond 2 - 3M Espe).

An appropriate dentine shade of the resin composite is laid down and finished as a scallop at the incisal border (see opposite).

A small, stiff artist’s brush can be quite useful for contouring and thinning the dentine layer.

Any tints are placed at this stage. A white tint can be used for small opacities and a blue tint used if the effect of incisal translucency is required.

Finally an enamel shade of the resin composite is placed, cured and polished.

Source: www.dentaloutlook.com.au
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General outline. (cont)

Step 9  Construct a bite splint >>

Take an impression of the upper arch and construct a ‘six-tooth’ anterior splint.
The splint protects the resin-composite build-ups against bruxism.
The author has found this type of splint is conducive to good patient compliance.

It can be worn at night or during recognised periods when the patient thinks he or she may grind.
The splint can be vacuum or pressure formed from a 2 mm-thick sheet of hard thermoplastic material such as Erkodur (Erkodent).

The incisal border of the dentine layer of resin composite is scalloped as shown. If any opacities are required a white tint is used and a blue tint is used if an incisal translucency effect is required.

Inset: A small, stiff artist’s brush can be very useful for thinning and contouring the dentine layer.

Establishing a treatment schedule.

In the example case shown, a preliminary visit was used to take impressions and obtain a centric-relationship record.

All the laboratory procedures were done before treatment started. Having all the moulds ready is important to save chair-side time.
The actual build-ups in the mouth were spread over two consecutive days. If such a schedule is not suitable for operator or patient, then modifications to the sequence of build-ups will be necessary.

There are no hard and fast rules as to the best sequence to follow.

One approach can be to first build-up all the canine and first premolar teeth. Follow this by building-up the upper centrals and all the first molar teeth. At a later visit build-up the remaining teeth.

Whatever sequence is chosen it is important that the patient refrain from heavy chewing until the job is completed and the final occlusal adjustments made.

Right: Photograph showing palatal surface of a ‘six-tooth’ anterior splint. The splint is vacuum formed from a 2 mm thick sheet of hard thermoplastic material [Erkodur - Erkodent].

As shown on the previous page, the material is extended to cover the incisal half of each of the 6 anterior teeth.

If the build-ups are to be spread out and not to be done over two consecutive days as in the case illustrated, one possible alternative is shown above.
The canine and premolar teeth could be built-up first followed by the upper central incisors. The first molar teeth could be done next and the remaining teeth at a later stage.

Source: www.dentaloutlook.com.au
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Subsequent treatment.

The beauty of the approach described is that it does not cut off options for subsequent treatment.

Because resin composite can wear with time, steps may be needed at a later stage to maintain a durable vertical dimension.

One approach is to place crowns on the main weight-bearing teeth, namely the upper and lower first and second molars. The patient can be warned that this may be required at some time in the future and can budget accordingly.

Summary

1. Resin composite can be used to restore the worn dentition conservatively and economically.
2. The procedure is facilitated if it is broken down into small steps.
3. Chairside time is reduced by the laboratory stages being completed before treatment starts.
4. A good sequence to follow in the tooth build ups is upper anterior teeth > lower anterior teeth > lower posterior teeth > upper posterior teeth.
5. The procedure described was carried out over two successive days of chairside time. However, this can be altered if it is not suitable to the patient or operator.
6. Because resin composite can wear over time, it may be necessary, in order to maintain a durable vertical dimension, to place crowns on the upper and lower first and second molar teeth at some stage in the future. If the patient is aware of this possibility it can be planned and budgeted for.

Source: www.dentaloutlook.com.au