Advanced restorative techniques and the full mouth reconstruction: part one

As an introduction to a series of 10 articles, **Dr Paul Tipton** looks at restorative techniques and the impact of new dental materials

Aims and objectives

To preview the restorative techniques that will be discussed during the next 10 clinical articles on advanced restorative techniques.

Most advanced restorative dentistry techniques, including that of full mouth reconstruction, have changed very little over the last 20 to 30 years. However, the impact of new dental materials, such as titanium and zirconia, has had a major influence on aesthetic dentistry and implantology during this time period. As a result, the profession may have an over-reliance on new materials rather than tried and tested techniques.

Some fundamental techniques are just as relevant today as they were when I started my Masters degree in conservative dentistry at the Eastman Dental Hospital in 1987. During the course of this series of articles on advanced restorative techniques, some old techniques will be revisited in light of today's aesthetic and restorative requirements and some newer concepts will be discussed in greater detail whilst dealing with the overall topic of full mouth reconstruction. This article previews the restorative techniques that will be discussed during the next 10 clinical articles on advanced restorative techniques.

Occlusal concepts

During my Masters degree at the Eastman and prior to that, my training in occlusion has been in gnathology and its principles as taught at the University of Michigan and by Derek Setchell, Richard Ibbotson and staff at the Eastman Dental Hospital during the last 20 years. This includes the five principles of occlusion, which are:

1. Retruded contact position (RCP) = intercuspal position (ICP) around retruded axis position (RAP)

- 2. Mutually protected occlusion
- 3. Anterior guidance
- 4. No non-working side interferences
- 5. Posterior stability.

The article on occlusion will review these concepts and also discuss when alternatives, such as long centric, are required (Figures 1-3).

Treatment of severe wear cases

One of the fundamental approaches to partial or full mouth reconstruction (and aesthetic dentistry) is envisaging the end result prior to starting the case. There is no better way to see the end result than the full and complete diagnostic wax-up. The aesthetic ability of both dentist and technician is stretched during this essential procedure. The article on diagnostics will review the procedures to complete a full mouth reconstruction at an increased vertical dimension with establishment of the lower occlusal plane, incisal edge positions, curves of Spee and Monson and anterior guidance prior to preparation, prototypes and fitting of the final restorations (Figures 4-6).

Full mouth reconstruction

Following on from diagnostic procedures in the previous article, the techniques of full mouth reconstruction will be reviewed including the use of various forms of articulators from the fixed condyle (average value) articulator through to the semi adjustable and on to the fully adjustable for the customisation of the condylar settings. The programming of these will also to looked at and discussed from 'fixed' settings to use of lateral and protrusive check bites, and finally the pantograph and newer 'Cadiax' machine (Figures 7-9).

Vertical dimension

Changes in vertical dimension are often required for either gaining restorative space during restorative procedures or for improving facial aesthetics. Occlusal splints are used to first verify that the increase in vertical dimension can be tolerated and this is easily accomplished in most cases as long as this increase is done around RAP or centre relation so that the condyles are in their most relaxed, bone braised and reproducible position. Increases and decreases in vertical dimension will be discussed showing positive changes in facial aesthetics as treatment is completed (Figures 10-12).

Dahl appliances

Bjorn Dahl first described the Dahl appliance in the early 1970s. Since then they have gradually been incorporated into the field of restorative dentistry although many



Figure 1: Severe aesthetic problems



Figure 2: Diagnostic waxing



Figure 3: Final restorations



Figure 4: Severe anterior wear



Figure 5: Diagnostic waxing



Figure 6: Final restorations



Figure 7: Anterior wear and erosion



Figure 8: Increased vertical dimension



Figure 9: Final restorations

orthodontists still dispute their efficacy and relevance.

The article on Dahl appliances will cover its history and usage in today's modern restorative dentistry, focusing on the use of traditional chrome cobalt 'Maryland wings' style of Dahl appliances and also the use of splinted temporary or prototype restorations used to gain space during crown procedures (Figures 13-15).

Duralay bonnets

Impression techniques demand a high degree of accuracy for the completion of the advanced restorative case. Often this is a difficult procedure for the restorative dentist when taking impressions both sides of the mouth at the same time (as a full arch impression where there are multiple teeth present) or undertaking an impression of mobile teeth as in the Lindhe/Nyman bridge.

Both of these applications will be reviewed and clinical

examples shown of how the duralay bonnets and coat hanger wire technique can be used not only for impressions but also for jaw registrations (Figures 16-18).

Periodontal prosthesis

The article on the periodontal prosthesis, commonly known as the Lindhe/Nyman bridge, reviews all the literature from the 1970s on this exciting technique, which allows multiple pontic replacement in fixed bridgework on often severely mobile and reduced number of abutment teeth. The science is overwhelmingly in favour of this type of bridge in certain situations where conventional dentures or implants are not possible (Figures 19-21).

Peter Wohrle bridgework

The duralay bonnet technique also crops up in this article 🕨



Figure 10: Pre-treatment



Figure 11: Facebow recording



Figure 12: Post-treatment



Figure 13: Palatal erosion



Figure 14: Dahl appliance



Figure 15: Space for final restorations



Figure 16: Combined periodontal/restorative/ implant case



Figure 17: Pick up implants with duralay bonnets



Figure 18: Final restorations

on individual crowns cemented onto a pink porcelain fused to metal bridgework cemented onto gold copings and then onto abutments screwed into dental implants – hence the abbreviated name 'Peter Wohrle bridgework' for ease of use after the dentist who first described the technique.

Several cases will be described using slightly different techniques to illustrate the technical difficulties in producing this bridgework but demonstrating the overall superior aesthetic result, optimal fit and maintenance potential (Figures 22-24).

Aesthetic periodontics

The last article in the series reviews the latest techniques in

periodontology used to enhance optimal aesthetic restorative techniques. The periodontist is an essential team member of the aesthetic restorative practice and an increasing amount of patients are requiring pink as well as white aesthetics. Connective tissue grafting, pontic site development, crown lengthening etc will be reviewed and discussed with step-bystep protocols (Figures 25-27).

Conclusions

Restorative dentistry has gone full circle with old techniques revisited and amended for today's dentistry. These techniques do not, however, get enough 'air time' in many journals as the importance of aesthetics takes over.





Figure 20: Cadiax recording



Figure 21: Final bridgework

Figure 19: Mobile teeth



Figure 22: Implant supported bridgework



Figure 23: Implant supported bridgework



Figure 24: Implant supported bridgework



Figure 25: Gingival recession



Figure 26: Connective tissue grafting



Figure 27: Porcelain veneers

It is my aim to help the reader understand these advanced restorative techniques and encourage them to put them into their everyday practice in order to help their patients and gain more clinical satisfaction.

For the writing of this article on advanced clinical techniques, I would like to thank certain members of my team, including Dr Ibrahim Hussain, BDS, M.Med.Sci.Implantology – implant surgeon, Mr Bradley Moore – dental technician, ADS Laboratory, Harrogate and Dr Andrew Watson, BDS, MSc, specialist in endodontics.



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