Cleanic: Clinical use of a recognised prophylactic paste with Perlite

By Dr. Fabio Cosimi D.D.S., Dr. Sussanna Giovannini D.I., I-Ostia Lido, Rome

Cleanic® prophylactic paste by Kerr has a creamy and smooth consistency. It allows for a pleasant fresh taste that is not too strong and is well accepted by the patient.

This creaminess and the clever use of binding agents have made the paste easy to use. Available in a tube, used with both cups and brushes, the paste stays more concentrated on the tooth surface, thereby avoiding the unpleasant sensation caused by coarse particles left in the patient’s mouth. Within a few seconds after application (during the cleaning cycle), Cleanic® paste removes extrinsic discoloration caused by chlorhexidine or stains caused by cigarette smoke.

(If either of these are present in a patient at a recall of 6 months, the application should be repeated).

An ideal combination for optimized esthetic success

CAD/CAM technology provides an efficient and reliable method to create full-contour restorations from high-quality zirconia for complex restorative needs in the posterior region.

By Marko Jakovac, DMD, MSc, PhD, Croatia, and Michele Temperani, CDT, Italy

Modern dentistry is not only concerned with oral hygiene or caries prevalence – wear from attrition, abrasion or erosion is increasingly becoming a subject of concern. These destructive oral processes are in large measure attributable to stress. Stress can trigger parafunctional habits and lead to gastric reflux and low pH values in saliva.

Additional factors such as bulimia and excessive consumption of soft drinks also come into play.

Case presentation

A 30-year-old female patient presented at our practice with pain in the posterior region. She was also dissatisfied with the esthetic appearance of her anterior teeth (Fig. 1). Considerable erosion of tooth structure on the palatal and cervical surface was observed at the preliminary examination (Fig. 2). An interview was then conducted to reveal that the patient consumed large quantities of soft drinks. On the basis of the clinical findings, we concluded that the woman was suffering from stomach problems with suspected bulimia.

Treatment planning

After careful history taking and a thorough assessment including a radiographic evaluation, we began to develop a treatment plan. The plan was to rehabilitate the entire oral cavity, to restore all teeth that had been damaged by erosion or caries prevalence – wear from attrition, abrasion or erosion is increasingly becoming a subject of concern.

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Creating the final restorations

We used the Zerotech CAD/CAM system and Zenostar® zirconia material (Wieland Dental) to fabricate full-contour crowns and bridges for the premolar and molar region. The plan was to customize the premolar restorations with IPS e.max® Press veneering ceramic using the layering technique. The anterior restorations were manufactured using the press technique with IPS e.max Press lithium disilicate glass-ceramics. These restorations were also customized using IPS e.max Ceram. On the one hand, the final restorations had to be manufactured in such a way that they were faithful to the parameters established in the simulation models. On the other hand, the final restorations should reproduce the shape and occlusal dimension of the temporaries, which had been consistently optimized during the long-term temporization stage. To achieve an ideal outcome, the laboratory was provided with a range of useful data to allow the technician to mount the models on the articulator and to intercure the gingiva of the patient. This resulted in a material that demonstrates a highly homogeneous shade. As the need for manual shading is eliminated, time savings can be gained in the fabrication of restorations, providing an additional advantage. Colour consistency is another advantage that should not be underestimated. A consistent colour is achieved, irrespective of the skills and experience of the technician. To ensure an optimum integration of the posterior restorations made of zirconia and the anterior restorations made of lithium disilicate, the vestibular area of the premolars was layered over with a veneering ceramic (IPS e.max Ceram) (Fig. 11). We used a conventional press technique in conjunction with IPS e.max Press ingots (shade LT2A) to fabricate the anterior lithium disilicate restorations and then completed the pressed crowns individually using the cut-back technique (Fig. 15).

Seating the restorations

CAD/CAM technology was used to fabricate the posterior crowns and bridges from monolithic zirconia. The occlusal conditions established in the long-term temporaries were accurately taken into account. Prior to seating the final restorations, we checked their accuracy of fit and shade match intraorally using glycine-based try-in pastes (Variolink® Esthetic Try-In). The crowns and bridges were permanently cemented using the dual-curing luting composite VarioLink Esthetic DC. In the mandible, the veneers were luted using the light-curing variant of the same luting composite (VarioLink Esthetic LC) in a neutral colour. This luting composite is easy to apply and excess material can be effortlessly removed during the cementation process.

Two weeks after the restorations had been placed, the patient came for another visit to our practice. Pink and white esthetics was harmoniously balanced (Figs 14 to 17). This outcome was possible due to the careful adaptation of the restorations to the needs of the patient and the smooth communication between practice and lab.

Conclusion

Successful treatment of young patients with complex treatment needs requires a high degree of accuracy and minimally invasive preparation methods. Full-contour zirconia restorations milled using CAD/CAM strategies provide a straightforward method to achieve accurate restorations, particularly for the posterior region. The success of anterior restorations continues to depend largely on the skills of the technician and on the use of materials with optimum properties, such as the IPS e.max lithium disilicate glass-ceramics.

Fig. 18: Anterior teeth prepared for the final restoration
Fig. 19: The master models were digitized to create the final restorations.
Fig. 20: Virtual construction based on the situation created by the long-term temporaries
Fig. 21: Restorations after having been milled from pre-shaded Zenostar T1 zirconia material (Wieland Dental)

Fig. 6: Long-term temporaries were instrumental in stabilizing the vertical dimension of occlusion.
Fig. 7: After long-term temporization, a bite record was taken to document the occlusal position created in the course of long-term temporization.
Fig. 8: Anterior teeth prepared for the final restoration
Fig. 9: The master models were digitized to create the final restorations.
Fig. 10: Virtual construction based on the situation created by the long-term temporaries
Fig. 11: Restorations after having been milled from pre-shaded Zenostar T1 zirconia material (Wieland Dental)
Fig. 12: Molars were created in full contour and the vestibular aspects of the premolars were layered over.
Fig. 13: Frontal view of the completed restorations on the model
Fig. 14: Two weeks after the restorations had been seated: optimal situation with successful pink and white esthetics

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Two weeks after the restorations

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Advanced Restorative Techniques and the Full / Partial Mouth Reconstruction - Part 2 Occlusal Concepts

In the second part of the series on advanced restorative techniques, Prof. Paul Tipton focuses on occlusal concepts.

By Prof. Paul Tipton, UK

Most advanced restoration dentistry techniques have changed little over the last 20-30 years, including that of the full mouth reconstruction. 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 must 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 Master's degree in conservative dentistry at the Eastman Dental Hospital in 1978.

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 discusses the topic of occlusion and occlusal concepts.

Gnathology

Stallard first coined the term gnathology defining it as the science that relates to the anatomy, histology, physiology and pathology of the masticatory system. McCollum formed the Gnathological Society in 1926 and is credited with the discovery of the masticatory system. McCollum published the classic ‘Research Record’ in 1921 and was a member of the Gnathological Society early and included a bone related position that is on an axis not a pin point and can only be achieved with a relaxed musculature.

The early gnathologists studied the recorded tracings made during mandibular movements. When the mandible travels forward along the sagittal plane it is considered a protrusive excursion or protrusion. Therefore, protrusion is the movement towards the anterior and it is the most retruded physiologic relation of the mandible to the maxilla to and from which the individual can make lateral movements that initially define the retruded axis position (RAP) or centric relation (CR) to the gnathologist. Further investigations led the gnathologists to believe that mandibular movements are governed by the three axes of rotation.

The concept of retruded axis position evolved into a three-dimensional position, resulting in its description as the rearmost, upper-mandibular relationships that accurately reproduced border jaw movements and which would then allow the technician to produce the most stable, functional and aesthetic occlusal form for indirect cast restorations. The registration of the horizontal and sagittal movements of patients was believed to allow the maximum cuspal height fossa depth with proper placement of ridges and grooves to enhance stability, function and aesthetics.

Fundamentals of gnathology

The fundamentals of gnathology include the concepts of retruded axis position (centric relation), anterior guidance, occlusal vertical dimension, the incisal guidance, and the relationship of the determinants of mandibular movements recorded using complex instrumentation to the occlusion in fixed prosthodontics. This has evolved into the five fundamentals of occlusal embrasure today.

1. RCP = ICP around RAP
2. Mutually protected occlusion
3. Anterior guidance
4. No non-working side interferences
5. Posterior stability

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The concept of retruded axis position evolved into a three-dimensional position, resulting in its description as the rearmost, upper-

most, and mid-most (RUM) positions of the condyles in the glenoid fossa. McCollum further suggested that initial guidance with freedom of movement from a centric related occlusion (CRO) to a more anterior tooth intercuspation (CO) will look in the posterior occlusion (long centric). The incisal guidance, along with ‘long centric’, is determined by the distance from transverse horizontal axis-centric relation and the normal freedom of movement in the envelope of function. This method requires that the incisal guidance be established and the mandibular posterior buccal cusps be placed to a height measured along the occlusal plane as dictated by the curve of height. The maxillary posterior teeth are developed after the completion of the mandibular restorations as dictated by a wax functionally generated path record. The definitive restorations are equilibrated into a centric relation position with mandibular buccal cusps onto the posterior occlusion (long centric).

Alternative occlusal concepts:

Pankey Mann Schuyler

As gnathology was evolving, several competing occlusal concepts and permutations were theorised, such as the Pankey Mann Schuyler (PMS) theory of occlusion. The Pankey Mann Schuyler concepts evolved out of an initial study group headed by LD Pankey on the east coast of America. Nomenclature was different and included centre relation (CR) instead of retruded axis position (RAP), centre related occlusion (CRO) instead of retruded contact position (RCP) and centric occlusion (COC) instead of inter-cuspal position (ICP). Pankey, following his observations on Australian Aborigines, suggested that uniform tooth contact and resultant wear on several teeth in lateral occlusion was a positive and inevitable outcome. As a modification of canine guidance, the Pankey Mann Schuyler philosophy in complete full mouth reconstruction was to have simultaneous contacts of the canine and posterior teeth in the intercuspative (working) excursions, known as group function, and only anterior teeth contact in the protractive excursive movement.

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a flattened fossa-marginal ridge contact with ‘freedom in centric’ anterior guidance and group function in laterotrusion (working) excursion.

Deflective contacts

Though 90% of natural dentitions have a deflective occlusal contact or an occlusal ‘prematurity’ between centric related occlusion (CRO) and centric occlusion (CO), it is usually in the form of a slide that has both a vertical and horizontal component occurring in all three planes. According to Ash and Rammford, the horizontal ‘long centric’, from centric to related occlusion to centric occlusion, should be incorporated into a restoration by means of a post restorative occlusal adjustment.

Dawson illustrates the ‘freedom in centric’ concept within the lingual concavity of the maxillary anterior teeth. He redefines long centric as vertical ‘long centric’, from centric relation or slightly anterior to it without varying the vertical dimension at the anterior teeth. Additionally, long centric accommodated changes in head position and postural closure (Moah position).

Gnathology versus PMS

Gnathologists believe that once the condyles are positioned in retruded axis position (centric relation), any movement out of this position should disocclude the posterior segment, thus multiplying any horizontal cusp-fossa area contact.

This belief, combined with the immediate anterior disocclusion, forms the basis of a mutually protected occlusion and limits tooth wear. The PMS occlusal scheme, however, encourages multiple occlusal contacts during lateral movements (group function or wide centre) and during proactive movements (long centre). This may have the effect of increasing tooth wear. It is, therefore, logical that the PMS occlusal scheme recommends that occlusal wear is physiological, not pathological as suggested by gnathologists. The task of adjusting maximum intercuspation contacts in two different positions on an articulator may result in a lack of precision in both positions. However, the restorative system has the ability to adapt to various influences and though, in the author’s opinion, the concept of gnathology will produce stable long-term results, some patients may require more freedom in their occlusion and the PMS concepts are not to be dismissed in these patients. Indeed, some PMS concepts such as waxing-up the curve of Spee and Monson prior to occlusal rehabilitation are incorporated into every day occlusal practice.

Case study

Patient A was referred to me for a full mouth reconstruction and aesthetic improvements to her smile (Figures 1-3). Initial impressions, facebow and jaw registration were taken for mounted study models (Figure 4). The study models showed the degree of over-eruption of her anterior segments and disturbances to the occlusal plane (Figures 5-8).

Initial diagnostic waxing (Figures 9-12) were completed using a lower curve of Spee of a 4” radius (anatomical average as recommended by the PMS techniques). Initial prototypes were placed with large palatal ramps on the upper anterior teeth to allow anterior tooth contacts and thus an immediate disclusion style of occlusal scheme as recommended in the gnathological approach.

Occlusion and the various occlusal concepts have caused – and continue to cause – debate. Whilst the author has been trained throughout his career in the concepts of gnathology, there is the recognition that other occlusal concepts, such as PMS and bilateral balance, may have a part to play in treatment of some patients.

During the rest of this series, the principles of gnathology will be used in the treatment of the partial or full mouth reconstruction.

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