could save the patient’s chairside waiting time; the biocere technique can simplify the design process; milling the restoration with a 0.5 mm original thickness and polishing after milling will decrease the risk of milling defect.

The exact process can be concluded as:
1. Obtain a precise pre-operation impression, and make the model. Use a CEREC scan to obtain information about the abutment teeth (Figs. 11 & 12).
2. Depending on the DSD result, make a wax-up on the pre-op model. The thickness of wax-up should be from 0.3 mm to 0.5 mm. Get the biocere copy scan of the wax-up model, and match accurately with the pre-op model (Figs. 13-15).
3. Setting the margin of the abutment teeth, the marginal edge line is not fixed because of the no preparation technique. The direction of the insertion should be defined first, which can cover most areas of the labial surface, incisal edge and adjacent surfaces. The border of the covered area should be the margin of the restoration (Fig. 16).
4. Shape formation of the restoration. Copy the target shape of the biocere model, the restoration should be calculated automatically. If there is any defect, it can be adjusted and corrected by the tool. If there are any areas not thick enough for 0.5 mm, it should be added to 0.5 mm to avoid fractures during the milling process (Figs. 17 & 18).
5. Modification and polishing of the initial restoration to 0.3 mm thick after milling. And fine polishing of the final restoration (Figs. 19 & 20).
6. Intracor try-in, fine adjustment and cementation (Figs. 21-24).
7. Four-year follow-up and recheck. The restorations are as excellent as before and the margins are tightly sealed, the colour is stable, there is no margin colored or whole colour changing. The patient is very satisfied with the aesthetic performance and function. A charming smile appearance has given her more confidence and vigour (Figs. 25-32).

Conclusions
The no preparation veneer is a kind of restoration with high precision requirement and manufactured difficulty. It is usually finished in laboratory. Getting benefit from chairside CAD/CAM techniques, immediate restorations in one appointment can be achieved, dentists can invite the patients to observe the process of restoration design and manufacture, and even get involved into the design. Patients may feel that they are participating in the treatment, establishing an emotional connection with the restoration, which may also make them more easily accept and love their restoration. The value of increasing the satisfaction should not be ignored.

Biocere design is the combination of traditional aesthetic design and digital virtual design. It is also the most convenient and fast technique. Nowadays, 3D virtual technique is becoming more and more established. Using 3D techniques directly to make a virtual design may also get wonderful restoration performance; it can be predicted that this pattern will become the mainstream of digital aesthetic design in future.

Restoring function and aesthetics with monolithic zirconia restorations

By Dr Ara Nazarian, US

With greater public awareness about cosmetic dental reconstructions, the dentist is often challenged with greater demands from the patient. This increased demand for aesthetic restorative treatment challenges the dentist, laboratory technician and dental manufacturers to develop technologies and materials to satisfy the discerning patient. Utilising digital aesthetic design in future. It can be predicted that this pattern will become the mainstream of digital aesthetic design in future.

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Dr Feng Liu
is a Clinician and Vice Director of Clinical Division of Peking University School and Hospital of Stomatology. He is also the director of the Clinical Division Esthetic Dentistry Training Center and member of many scientific associations worldwide.

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Most importantly, the patient said looked younger and happier. Coworkers had remarked that she exhibited excitement about and confidence with her provisional restorations, commenting that all her previous treatments, phonetics and bite. Already, she was quickly filled and placed on the prepared teeth (Figs. 5 & 6).

A full-arch impression was taken using Instant Custom Trays (Good Fit). Made of a proprietary material (PMMA) that becomes mouldable when heated in boiling water, these trays provide a quick, efficient way of capturing a dimensionally accurate impression with uniform thickness of the impression material.

Once moulded and customised to the patient’s maxilla and mandible, full-arch impressions were taken using a heavy and light polyvinylsiloxane impression material (Panasil, Kettenbach). The patient was asked to bite into the impression to replicate the White Wax-Up when fabricating the definitive restorations.

Laboratory considerations
The White Wax-Ups, colour photographs, impressions and bite relations were forwarded to the dental laboratory (Arrowhead Dental Laboratory). A scan of the White Wax-Ups was used to select an appropriate shade, tooth size and occlusion from the library of teeth available in the 3Shape software (Fig. 7).

Using 3Shape Communicate, images of the proposed reconstruction were forwarded to my office by e-mail. Any minor adjustments in tooth shape and contour were communicated with the technical adviser to achieve the ideal aesthetics. Once approved, the milling process was initiated.

Cementation
Before try-in of the definitive restorations, the provisional restorations were removed using the Easy Pneumatic Crown and Bridge Remover (Ivoclar) and any remaining provisional cement was cleaned off the prepared teeth. The maxillary and mandibular zirconia restorations were tried in to verify fit, form and shade. After the patient had been shown the retracted view for acceptance, the cementation process was initiated.

Using the 3Shape Communicate software, the retracted view for accepttion was shown to the patient. The provisional restorations were removed using the Easy Pneumatic Crown and Bridge Remover (Ivoclar) and any remaining provisional cement was cleaned off the prepared teeth. The maxillary and mandibular zirconia restorations were tried in to verify fit, form and shade. After the patient had been shown the retracted view for acceptance, the cementation process was initiated.

A few weeks later, the patient returned for evaluation of aesthetics, phonetics and bite. Already, she exhibited excitement about and confidence with her provisional restorations, commenting that all her coworkers had remarked that she looked younger and happier.

Most importantly, the patient said that she no longer experienced discomfort in her temporomandibular joint and that her bite had never felt better. Since no adjustment or modification of the temporary was needed, the dental laboratory was instructed to replicate the White Wax-Up.

After the impressions had been completed, a bite relation jig fabricated on the White Wax-Up models was tried in the mouth. Medium-body impression material (Panasil) was placed into the relation jig and seat ed in the patient’s mouth on to the prepared teeth (Figs. 5 & 6).

The patient was asked to bite into the relation jig until she reached the vertical stops and the material set. Instructions for the size, shape, colour and position of the final restorations were forwarded to the dental laboratory (Arrowhead Dental Laboratory), as were the White Wax-Up models. Also, a stump shade (Ivoclar Vivadent) was selected for shade matching of the preparations to assist the laboratory technician in creating natural-looking restorations.

Provisionalisation
Provisional restorations, which would aid in determining the best shape, size, colour and position for the definitive restorations, were made from Sil-Tech (Ivoclar Vivadent) impressions of the White Wax-Ups provided by the dental laboratory.

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riva luting plus (SDI), a resin-modified, self-curing glass ionomer luting cement, was used for the cementation of these zirconia restorations because it can be used without special preparation using cleaning agents, nor does it require any bonding agent (Fig. 9).

According to the manufacturer, riva luting plus utilises SDI’s proprietary ionglass filler. Ionglass is a radio-opaque, high-ion-releasing reactive glass used in SDI’s range of dental cements. riva luting plus releases substantially higher levels of fluoride to assist with remineralisation of the natural dentition. This higher level of fluoride has a proven antimicrobial activity against three cariogenic bacteria: Streptococcus mutans, Streptococcus sobrinus and Lactobacillus.1 In addition, riva luting plus has low solubility in the oral environment, increasing the material’s ability to resist degradation and wear at the margins caused by oral acidity.

The preparations were washed and dried to the extent that they were still slightly moist. At this time, the cement capsules were depressed consecutively to activate and placed in the ultramat 2 (SDI) amalgamator for only ten seconds for trituration.

Using the applicator dispenser (SDI), the cement was loaded into the restorations (Fig. 8), starting from the midline and working distally. With a very low film thickness and creamy consistency, riva luting plus cement was dispensed into the restorations with easy insertion and seating.

Removal of excess cement was cleaned up in about two minutes at the gel phase. After the cement was fully set at five minutes, the occlusion was verified and adjusted. The overall health and structure of the soft tissue and restorations were very good. The patient was extremely satisfied with the definitive results (Figs. 10–12).

The occlusion was checked and verified with T-Scan (Tekscan) to make sure that all of the proper points of contact were in their ideal positions to ensure longevity of the reconstruction. The patient no longer experienced pain and was very pleased with her new enhanced smile (Fig. 10).

Conclusion

In conclusion, having a systematic method for treatment planning, material selection, tooth preparation and cementation, the dental provider will be able to address the needs of the patient more effectively and efficiently. Because of this and more, the final outcome will be much more predictable aesthetically and functionally.

Acknowledgement

Special thanks to Chris Barnes and his staff at Arrowhead Dental Laboratory for the fabrication of the restorations depicted in this case.

Dr Ara Nazarian
He maintains a private practice in Troy in the US with an emphasis on comprehensive and restorative care. He is a diplomate of the International Congress of Oral Implantologists and Director of the Ascend Dental Academy.

He has conducted lectures and hands-on workshops on aesthetic materials, grafting and dental implants throughout the US, Europe, New Zealand and Australia.