More and more patients in our practice are expressing a strong desire for a "Hollywood" smile. When delivering cosmetic smile enhancements, whether utilising minimal-preparation porcelain veneers or durable zirconia crowns, there are three basic principles to consider: aesthetics, symmetry and function. Cohesively, these principles ensure mindfulness pertaining to the size, shape, contour and positioning of teeth. Equally as important is gingival architecture; uniform, pink gingivae are signs of a healthy smile and are highly desirable.

The restorative team, when using these guiding ideologies for each smile makeover, can successfully restore a smile to its proper form, function and appearance. This article demonstrates the significance of utilising a prosthetically driven treatment plan when restoring missing teeth in the anterior maxilla with dental implants to achieve an aesthetic smile makeover.

Case report

A 36-year-old female patient presented to the practice expressing dissatisfaction with her smile (Fig. 1). This unhappiness was the result of a car accident seven years before, during which the patient lost her maxillary anterior teeth (teeth #13–11 and 21) and tooth #22 was fractured. Restorative dental work included endodontic treatment, followed by a core and crown restoration, as well as a removable partial denture in this area of the mouth.

Approximately two years prior to this initial consultation, another oral health professional had placed three dental implants in positions #13, 11 and 21 with the end goal of delivering a fixed partial denture. However, during this process, the dentist was unable to provide a satisfactory fixed provisional restoration, and this led the patient to our practice.

Initial diagnostic evaluation consisted of a series of digital images with study casts, a centric interocclusal record, and the necessary radiographs. The CS 8100 (Carestream Dental) was used to obtain CBCT images to properly evaluate the bone surrounding the previously placed dental implants. Clinical examination revealed well keratinised tissue and bone surrounding the dental implants. However, tooth #22 was somewhat flared facially, and recession had exposed the gingival margin of the crown restoration. Radiographically, there was a periapical lesion at the apical region of the tooth.

Considerations regarding the incorporation of tooth #22 were discussed with the patient. Respect was also given to its position within the arch, the existing crown resto-
ration and the failed endodontic treatment. Ultimately, it was recommended that the dental laboratory fabricate a diagnostic wax-up illustrating the result should tooth #22 be removed. This would allow for a five-unit fixed partial denture (FPD) extending from position #13 to position #22 with three abutments and two pontics. DenMat Lab was chosen specifically based on its expertise in anterior aesthetic combination cases.

Planning

To develop a treatment plan, full-arch dental impressions (Silginat, Kettenbach) were taken and sent to the laboratory. Owing to the alveolar defect present in the ridge, it was suggested that the laboratory add pink wax in the gingival area, where it would be replaced with pink porcelain in the final restoration (via an FP-3). The FP-3 dental implant prosthesis, created by Dr Carl Misch, allows for the re-establishment of proper function, aesthetics, lip support and phonetics. This restoration assists clinicians in achieving their patients’ desired outcomes in the aesthetic zone.

The patient, upon seeing the diagnostic wax-up, was thrilled with the potential outcome of her case (Fig. 2). She immediately scheduled her appointment for the recommended treatment.

Starting with a 3.3 mm Narrow CrossFit implant (BLT, Straumann) level impression (Figs. 3 & 4), the technicians virtually extracted tooth #22, fabricated custom CAD/CAM abutments (implants #13, 11 and 21), and then fabricated a polymethylmethacrylate (PMMA) five-unit fixed provisional restoration. This restoration was designed as an FP-1 restoration to determine whether it would suffice in the aesthetic zone, as well as try to further enhance the tissue contour.

Preparation

The patient presented to the office once the abutments and provisional restoration had been received from the dental laboratory. Anaesthetic (1:10,000 Xylocaine) was administered and treatment initiated.

First, the healing caps were removed from the dental implants and replaced with gold anodised CAD/CAM custom abutments. The abutments were seated and torqued with a torque wrench at 25 Ncm, according to the manufacturer’s instructions (Fig. 5). Access openings were then sealed with PTFE tape. It is important to note that the dental laboratory designed the abutments so that the facial margins were 0.5 mm apical to the free gingival margin to avoid display of metal.

Next, tooth #22 was extracted using the Physics Forceps (GoldenDent; Fig. 6). The tooth was extracted with great care to avoid disruption of the surrounding tissue (Fig. 7). A curette (Hartzell, DenMat) was used to debride granulation tissue from the socket. An alloplastic material (OsteoGen, Impladent) was then inserted and packed into the socket (Fig. 8), ensuring it was in tight contact with the bony walls. The PMMA provisional restoration (Fig. 9) was then cemented with a temporary cement material (E.T.C. Easy Temporary Cement, Parkell) and the patient instructed on how to care for it during the three-month healing period (Fig. 10).

Upon satisfactory healing, the patient returned to the dental practice three months later for impressions to be taken for the definitive FPD. Using a polyvinylsiloxane material (Panasil, Kettenbach), a full-arch impression was taken of the maxillary arch using a traditional crown and bridge technique. This impression, along with occlusion registration records and the opposing model, was forwarded to the dental laboratory with instructions to fabricate the FPD with the LumiZir zirconia material (DenMat Lab).
owing to its aesthetics and strength.3–5 LumiZir full-contour crowns are fabricated from the strongest, most translucent zirconia on the market and offer a flexural strength of greater than 1,150 MPa. Thanks to these features, this restoration offers the benefits of unmatched strength and lifelike aesthetics.

Laboratory considerations

After reviewing the digital clinical images, diagnostic wax-up and patient’s feedback, it was determined that the definitive restoration would be much more aesthetic if it was designed similar to the wax-up as an FP-3 restoration. This would ensure that pink porcelain would be used to fill in the gingival embrasures, thereby contributing to a more natural appearance.

DenMat Lab is a specialised laboratory completely focused on anterior aesthetic cases. The laboratory is equipped with the latest CAD/CAM technology and employs a team of highly trained dental technicians, who consult with the dental professional at each phase of treatment. This leads to highly predictable and aesthetic outcomes, no matter how complex the case.

Cementation

Before try-in of the definitive restoration to verify fit, function and aesthetics, the provisional restoration was removed using a pneumatic crown and bridge remover (Dent Corp). Remaining cement was cleaned off the abutments (Fig. 11) and the FPD tried in for evaluation. The patient was first shown the retracted view, followed by a full-face view for acceptance of the definitive restoration.

With the patient’s approval, the cementation process was initiated. Implant cement (Infinity SE, DenMat) was used to cement the FPD (Fig. 12).

Conclusion

In cases such as this, it is important to look at the entire smile when restoring it to proper aesthetics, form and function. The process should begin with a diagnostic wax-up, which is an invaluable tool for planning and communicating with the patient about the proposed treatment plan. As dental providers, our goal should be to listen to our patients’ needs and guide them to the appropriate solution using our knowledge and experience.

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Editorial note: A list of references is available from the publisher.

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