The old adage goes that if 10 dentists were to treatment plan a case you will get as many varying opinions. There is nothing wrong with this for simple general restorative cases, but when planning for implants, it is wise to opt for the simplest option. The following case highlights the point that proceeding with a more complex treatment plan may have been for a poor final result, as well as an unpredictable long term prognosis and outcome for a young patient.

History and Presenting Complaint

This young gentleman presented for a second opinion, after being recommended by a hygienist. She was concerned about, what she felt was a rather large treatment plan that was recommended to her son by another respected dental centre.

Her son, a student on his gap year, had lost his upper right lateral in a skiing accident. A provisional acrylic crown was bonded to adjacent teeth as an emergency measure and the centrals were split at this visit (Fig. 1, 2, 3, 4). The upper centrals were also traumaised during the accident, with periapical radiographs exhibiting significant pre-existing furcation lesions at various levels (Fig. 5). The upper right lateral and central had also been root treated shortly after the accident and all teeth have been asymptomatic since.

Treatment Plan by Another Dental Centre

The initial suggested treatment plan included the extraction of the upper right lateral and central incisors and the upper left central incisor, with the provision of an immediate partial acrylic denture. This would have been followed by the placement of an implant supported bridge with implants in the upper right lateral incisor and upper left central incisor positions. Although this is a viable option, it would have led to the extraction of 3 important teeth in the smile zone of this young gentleman. This treatment plan had been accepted by the young gentleman and his parents but fortunately, due to a waiting list for the implant phase of treatment, this treatment plan had still not been carried out.

My Proposed Treatment Plan

To view the fact that the traumatised centrals have been asymptomatic, with no apical changes since the accident, I suggested leaving the centrals alone with no treatment initially. I recommended the extraction of the upper right lateral incisor, with the immediate placement of an implant. A provisional tooth would have been provided. A final abutment and porcelain crown would then be fitted after the healing phase. It is important to inform the patient that further treatment may well be required on the central incisors. Sizing the abutment in this way will minimise the risk of losing soft tissue architecture. This treatment plan was accepted.

Surgical Phase

The patient attended for treatment and was given an Arnica 200c pill (a small succus pill, coated with the remedy) to take prophylactically. Arnica is a homeopathic remedy that I routinely use for all elective surgical procedures. It has been shown to help reduce bruising and swelling associated with surgery and I have noticed a marked difference in both patient reported symptoms, as well as clinical symptoms, including the speed of healing. A 50 second Chlorhexidine pre-surgical rinse was carried out prior to administration of local anaesthesia. This flapless surgical technique was utilised by using a size 15c micro-blade into the den- gingival sulcus around the upper right lateral incisor root. The root was then gently and atraumatically elevated using periosteotomies, taking care not to stress or damage the fragile buccal plate. The resulting socket was inspected, especially for the integrity of the buccal plate. A nice instrument to do this with is the AstraTech™ measurement gauge. It has a blunt, hemispherical end, which gives tactile feedback and can also be used to measure the length of the socket. It can also be used to give visual feedback on the direction of the imminent osteotomy site preparation. Socket curettage was carried out to ensure it is free from any granulation tissue. The buccal plate, although thin proved to be intact and ended approximately 5mm below the labial gingival level. The initial pilot drill used was positioned with a slight palatal inclination and position to the previous root apex, to avoid perforating the lingually. The site was prepared using a standard sequence and saline, with special attention to avoid the thin buccal plate of bone during preparation. A 3.3 x 16mm NobelReplace Tapered Groovy implant was torqued into position with an initial stability of 20Nm and ensuring that a tri-channel internal lobe is positioned mid buccally. The initial stability of 20Nm is not enough to immediately re-store an implant. If immediate loading has been planned, you should always have a contingency plan of good primary stability of the implant is not achieved. The implant head was placed 5mm apical from the anticipated final labial gingival margin (adjacent den- tingival level can also be used as a guide if needed). There was a 2.5mm space between the buccal plate and the implant. A narrow healing abutment was placed and the void was filled with a mixture of BioOss™ (Geistlich) and autogenous bone harvested with an Astra™ Bone Trap. It was my usual protocol to fill voids that are approximately 1.5mm or more. No su- tures were needed.

Restorative Phase

12 weeks later, open tray impressions were taken and custom shade matching was car- ried out. It is important to take a photo of the contra-lateral tooth for comparison (Fig. 1, 2) and a discussion with the patient about whether to copy this tooth needs to be communicated with the lab, especially if there are any unusual characteristics. In this case the upper left lateral had a mesio-buccal rotation and the patient wanted a slight element of rotation with his new tooth. Due to the depth of the implant head it was decided best to use a goldadapt abutment. This was covered with a layer of opaque porcelain to help mask any possible metal shine through as much as possible. This was torqued down to 20Nm and the access filled with GP and a temporary provisional composite. It was also decided to make a Lava crown with an opaque core (5M ESPE). The Lava crown was tried in and approved by the patient for shade and form before being cemented with temporary cement.
a prototype restoration. In situations where tissue conditioning has not been carried out, the final crown will most likely have a different emergence profile to the healing abutment. In these cases the final crown needs to be tried in and seated with constant force to overcome the pressure from the circumferential tissues. As this is done blanching will be evident (Fig. 8). It is important to wait for the blanched tissues to return to their normal colour before final cementation. Failure to do this may result in ischaemia of the surrounding tissues, pain and may even lead to an element of necrosis, if the patient is allowed to leave in this way.

Occlusion was checked with articulating paper in centric relation, as well as in excursive movements until shimstock foil glided through with light contacts. A post-restorative baseline radiograph was taken showing good bone levels.

A 3 month review and 1 year follow up were carried out (Fig. 11, 12, 13). The centrals were still symptom free with no radiographic changes at both appointments. Bone levels were also as they were at baseline.

Conclusion
Implant treatment involves many variables and as clinicians we must consider all these parameters to provide the best outcomes for our patients. If we aim to keep treatment as simple as possible, then the success of the final case will be greatly increased. Careful consideration needs to be given to the proximity of the implant surface to the labial bone, as well as the position of the implant head to adjacent teeth, as there is a horizontal, as well as vertical component to the biologic width.5 (sometimes now termed the biologic doughnut). No matter how talented your ceramist, if the final restoration is not framed by the surrounding tissues in the correct way, the outcome may be compromised. A key aesthetic concern in implants is to maintain the gingival architecture and harmony, especially the interdental papillae.4 The immediate implant protocol, in combination with a flapless, single stage technique, seems effective at maintaining the gingival architecture and when combined with a good ceramist, gives the clinician every chance of replicating nature.
With our current level of knowledge and understanding of implants as well as having the services of the most talented master ceramists, we have no excuse not to deliver the very best for our patients.

Acknowledgement
I would like to thank Atsu Kakinuma at Dental Excellence, for his invaluable contribution for the technical aspects and ceramic work in this case.

Disclosure
The author has no financial or personal relationships, directly or indirectly, with any companies or products mentioned in this article, that could have influenced this work inappropriately.

A complete list of references is available from the publisher.

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Zaki qualified from Guy's Hospital in 1996. His main interests lie in all aspects of Cosmetic Dentistry with a special interest in Dental Implant Treatment, where he has achieved a Masters Degree from the GKT Dental Institute in 2001. He strongly believes in Continuing Professional Development and lectures on all aspects of implant and cosmetic dentistry. He sits on the Board of Directors of the British Academy of Cosmetic Dentistry as Chairman of the Study Clubs Committee and is a member of the American Academy of Cosmetic Dentistry. He is also an editorial consultant for Dental Implant Summaries, a widely distributed international implant journal and is a member of the Association of Dental Implantology in the UK.

He has embarked upon a career pathway leading to him gaining a Diploma in Sedation, a Diploma in Hypnosis, and most recently he has become a Licenciate of the Faculty of Homeopathy.

Zaki will be lecturing at the BACD conference in Birmingham on November 13th-15th, go to www.bacd.com for more information.

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Working with composites

Although there are many composite materials on the market, it’s not necessarily the performance of the material that is most important, but the skill in carrying out restoration, says Dr Gordon Penman

For the past few years, I have been using Esthet-X from Dentsply as my material of choice for anterior and posterior composite restorations. This is a visible light-cured, radiopaque composite restorative material. I also use X-flow, which is another Dentsply product, for any situations where I feel that a flowable composite is indicated.

A composite is a material that consists of two or more components, and a dental composite contains inorganic fillers that are incorporated into a resin matrix. The filler particles mainly confer the required physical properties of the material such as strength, modulus of elasticity, polymerisation shrinkage, co-efficient of thermal expansion and water sorption.

Esthet-X utilises barium alumino-fluorohydroxosilicate (BAFG) with silicone dioxide particles as the filler and these are embedded in a resin matrix which chemically is made up of bisGMA adduct, ethoxylated bisphenol-A-dimethacrylate and triethylenglycol dimethacrylate (TEGDMA). The material also contains photoinitiators, stabilisers and tints. The TEGDMA is added to dilute the monomer, which is very viscous. This makes the resin easier to use.

Esthet-X contains 77.5 per cent filler by weight and 60 per cent filler by volume. The average particle size is 0.7 microns and it is classed as a micro hybrid composite.

Know your material

As with any material, there is a learning curve that needs to be negotiated before one can utilise the material to maximise its optimum performance. I feel that perseverance is justified as I am becoming increasingly confident of achieving good quality, aesthetic restorations with Esthet-X.

The composite handles well with minimal stickiness to instruments and little slump. This allows it to be sculpted into the desired anatomical form, which I like. There is a wide range of opaque, body and enamel shades which facilitates a layering technique to fabricate a restoration which closely resembles natural tooth in appearance.

The shade guide, although at first quite daunting in complexity, provides a ‘recipe’ card, which advocates the mix of shades which should be chosen to build a restoration that will have the desired shade and translucency.

Choosing a colour

For small cavities, simply selecting the body shade gives a relatively quick and aesthetically pleasing result. More extensive restorations where there has been extensive tooth tissue lost, allow the use of the opaque, body and dentine shades to create an extremely life-like restoration.

In the kit, the compules are colour coded for easy differentiation and identification.

I use a Ronvig composite warmer to pre-heat the Esthet-X compules. I find that this allows me to place the material more easily into the prepared cavity and studies suggest that pre-warming composite enhances the conversion rate and produces a more highly cross linked polymer network. It is suggested that this should improve the mechanical and physical properties of the final restoration.

I use a Dentsply LED curing warmer to pre-heat the Esthet-X compules. I find that this allows me to place the material more easily into the prepared cavity and studies suggest that pre-warming composite enhances the conversion rate and produces a more highly cross linked polymer network. It is suggested that this should improve the mechanical and physical properties of the final restoration.

The finishing touches

Achieving a smooth, well-polished surface can improve the longevity and aesthetic success of a restoration by decreasing plaque accumulation and surface stain. Having a smooth surface is also less likely to cause wear of opposing enamel or restorative materials. I find that I can achieve a well-polished, high-lustre restoration by using the Enhance system incorporating Prisma Gloss polish.

There are many composite materials on the market and it can be difficult to decide on which product to use. I don’t believe that there are major differences in performance between many of the well-known brands, and that the technique and skill level used to place these types of restoration is probably more important than the material itself.

References


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