Aesthetic Restoration on misaligned dental implants

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Introduction

Implantology has had a profound effect on modern dentistry, for the clinician, for the technician and most importantly for the patient. Implants have allowed us to provide our patients with an alternative to removable dentures. Too frequently, removable dentures are ill-fitting and non- functional. Patients adapt their eating habits to suit these dentures, often resulting in a decline in quality of life. In some extreme cases, malnutrition and reduced life span can be the result.

Despite the progress and developments in Implantology over recent years, a number of problems still persist. Nature, genetics and patient lifestyle often create very difficult problems for us to deal with, especially when trying to achieve aesthetics in line with patient expectations.

Poor maxilla and mandibular bone shapes and structures are usually the main hindrance to our ability to provide the patient with functional and aesthetic restorations (Figure 1). Too often the surgeon has no alternative but to place the implants at angles that are not conducive to function or aesthetics. A number of techniques such as angled abutments and "custom-posts" with cementable crowns have been used to overcome this problem, but in many cases these techniques result in compromised aesthetics.

This illustration shows a common problem faced by the technician - the screw access hole emerging through the labial surface (Figure 3).

How does one hide this and still achieve acceptable aesthetics? Bearing in mind always that the patient expects excellent aesthetics as implant procedures are expensive!

How often have technicians, when struggling with a case, wished they could "bend" the abutment, to have the access hole emerge in the ideal position, either to the central fossa on molars or to the cingulum on anterior teeth? (Figure 2).

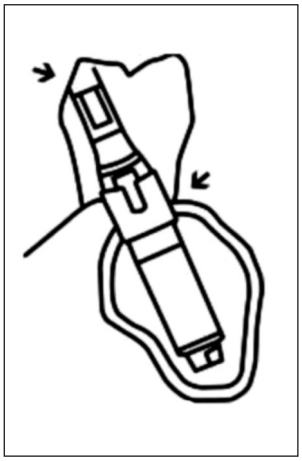

Figure 1.

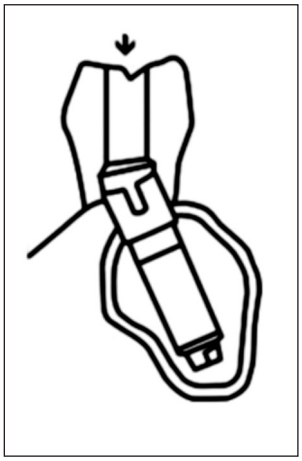

Figure 2.

Figure 3.

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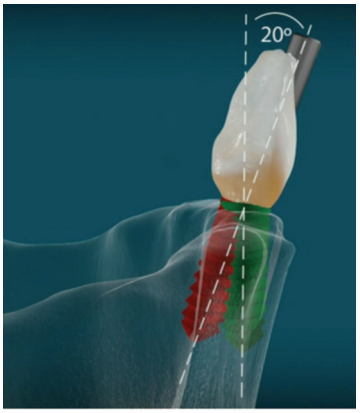

Figure 4.

Figure 5.

Figure 6.

The concept

A new product that helps us overcome the above problem has been released onto the market after six years of research, development and clinical trials. The product is called the Dynamic Abutment® and is produced by Talladium International Implantology based in Spain. The product has been subjected to extensive University testing and has received FDA approval. (Figure 4)

The important feature about the Dynamic Abutment® system is the patented design of the screw head and screwdriver. The screw head has a 1,3mm internal hexagon with a concave upper surface. The screwdriver has a spherically shaped hexagonal head. These head shapes allow the screwdriver to fully engage with the internal hexagon of the screw at any angle up to 20° off centre. (Figure 5)

A suitably designed and patented abutment called the Dynamic Abutment® is used in conjunction with the special screw to make this system fully adjustable in any direction. It gives the technician the ability to "bend" the abutment to ensure the access hole is placed in the most ideal position, to provide a screw retained structure that meets the highest aesthetic requirements. (Figure 6)

The abutment consists of a precision machined metal base. Above the machined inter face is a body with a suitably designed emergence angle and a "ball joint" on top. The screw access hole is machined through the ball joint. Clipped over the ball joint is a plastic wax up cylinder. This cylinder is adjustable to whichever direction the technician deems suitable for his structure design and "locked" in place with wax. (Figure 7)

The final metal structure shape is waxed over the cylinder and the cylinder is trimmed accordingly. The whole structure is invested, burned out and cast. (Figure 8)

Figure 7.

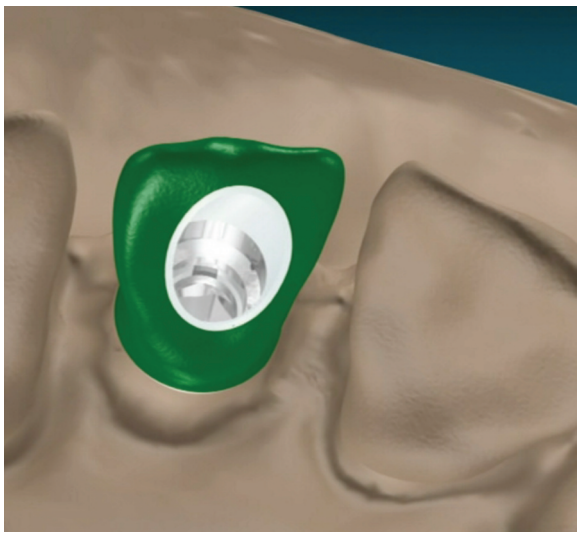

Figure 8.

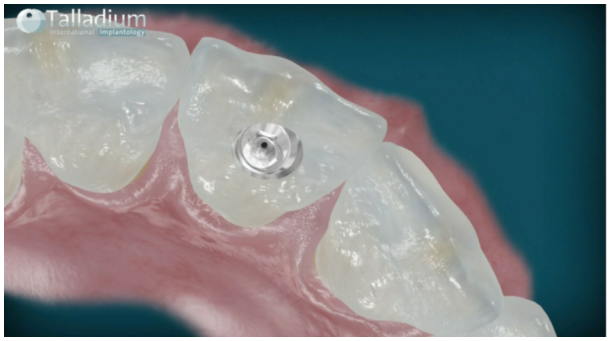

Figure 9.

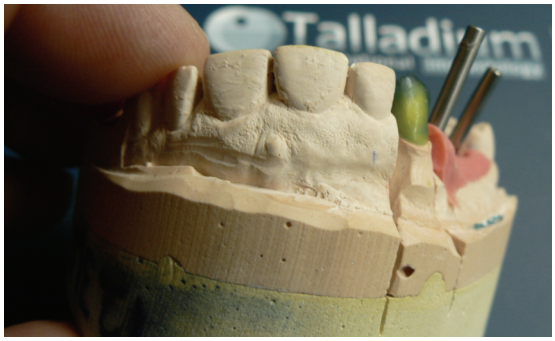

Figure 10.

After casting, the technician trims, prepares and veneers with porcelain to achieve the desired final result. An additional plus feature of the system is that the Dynamic Abutment® is manufactured from a porcelain bonding, FDA approved, non-precious alloy, Talladium Tilite®. This not only means a more economical restoration due to the absence of precious metal alloys, but also that porcelain veneering can be safely applied down to the abutment margin resulting in improved aesthetics. (Figure 9)

Case Report

A 59 year old female patient presented to Dr X complaining about severe ongoing pain in the right side of the maxilla. The patient explained that this region had been problematic for a number of years. A few years earlier he had the second premolar extracted. On examination it was found that there was severe decay in the region and teeth 14 and 16 needed extraction, tooth 13 could be saved and crowned. The patient admitted that he regularly sucked peppermints and tended to keep them in this region of the mouth whilst sucking. The patient requested an implant bridge with implants placed in 14 and 16 regions.

Southern Implants Tri-Lobe® IA-L-43 implants were selected and placed in positions deemed suitable for long term support and integration.

We prefer to manufacture screw retained implant structures wherever possible, particularly in bridgework cases.

After casting the model in the laboratory it was discovered that the angles of the implants were such that the screw access holes would emerge buccally thus ruling out a traditional screw retained bridge. The matter was discussed with Dr X and the patient, we proposed trying a new system that had been brought to our attention, namely the Talladium Dynamic Abutment® System. (Figure 10)

Internal connection implants such as the Tri-Lobe®, Nobel Replace® Zimmer Screwvent®etc. make use of long retaining screws, these screws pose a particular problem to the concept of the Dynamic Abutment® system as they are too long to pass through the access "chimney" when angled. Talladium have overcome this problem by designing adaptors that screw into the implant and convert it to an external hex, onto which the normal Dynamic Abutment® is placed and secured with the recommended screw. In this case we used the recommended EBRPL43 adaptor. The EBRPL adaptor is inserted into the implant and tightened with the socket driver DSEB to 35nm.

NB. In cases where internal connection implants are used in single units, it is essential that the clinician inserts and tightens the EBRPL adaptor before taking the impression as this will indicate the correct index position for the technician.

Figure 11: EBRPL43 adaptor.

Figure 12: EBRPL 43 inserted into implant analogue.

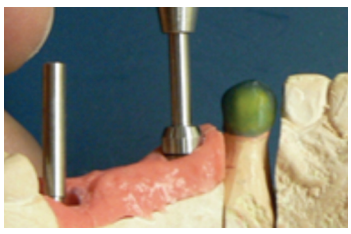

Figure 13: EBRPL43 tightened with DSEB socket.

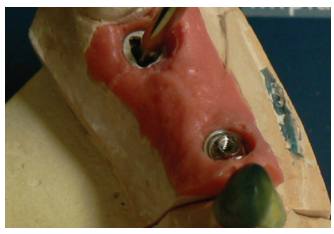

Figure 14: EBRPL43 securely in place.

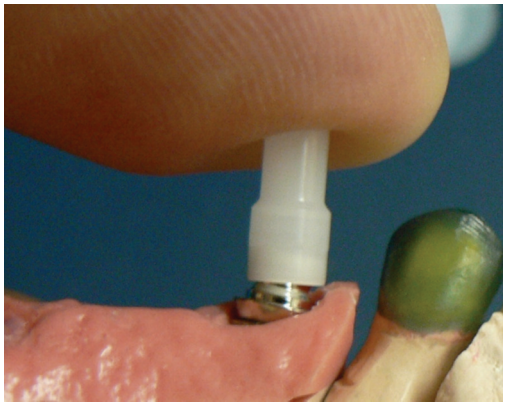

Figure 15: Dynamic Abutment® being adjusted.

Figure 16: Dynamic Abutment® checked for alignment.

Figure 17: Waxed frame with corrected access angles.

Figure 18: Finished metal frame showing ideal access holes without the bulkiness normally associated with custom posts.

Once the adaptors EBRPL43 were in place and torqued to 35nm, non–engaging Dynamic Abutments® PDINT/T were secured to the adaptors with laboratory screws and the plastic cylinders adjusted to the preferred angles.

Waxing-up was completed. The wax work was invested in Talladium Micro-fine 1700® investment material which has a particularly fine particle size; it mixes to a very creamy consistency that promotes excellent bubble free penetration to all areas to ensure an accurate reproduction of the wax work. The wax was burned out and the casting was done in Talladium Tilite® V alloy.

Conclusion

The Talladium Dynamic Abutment® System enabled us to manufacture a screw retained Implant bridge in a situation that previously would have required a cementable bridge on custom posts. In order to accommodate the custom posts, our metal framework would have been more bulky reducing the amount of space available for porcelain veneering. We were thus able to produce a metal frame that provided us sufficient space to veneer porcelain and produce a restoration that fulfilled all our expectations and resulted in a very satisfied patient.