The EasyClip Bar

Osteon Medical introduces the first complete CAD/CAM fabricated implant removable Fixed Complete Denture (FCD)

By Sascha Hein

"I felt I had recognized the obvious problem with their bars: they were just that - bars, nothing else. This was merely a half-finished product in my eyes..."

In a previous contribution titled "The implant removable fixed complete denture (FCD)",[1] I discussed the concept of the milled primary bar in combination with an electroplated (galvano) supra structure. Since then, a number of "rem FCD's" as they were nicknamed, have been fabricated, using the traditional techniques I described. Whilst all of them have performed admirably, the labour intense manufacturing cost involved have proven to be a considerable obstacle for many potential candidates. In a bid to improve this unfortunate situation, I luckily found a small but very innovative high-tech company, right here in Australia in Melbourne, to help me make the removable FCD a more widely available treatment option.

Development

During my quest of finding more cost-effective ways of producing the removable FCD, it became obvious to me that in this day and age, CAD/CAM technology would naturally lend itself to this process. After all, a number of companies have already been offering CAD/CAM milled primary bars for almost three years. My suggestions fell on deaf ears with the "big" companies however, which was frustrating. I felt I had recognized the obvious problem with their bars: they were just that - bars, nothing else. This was

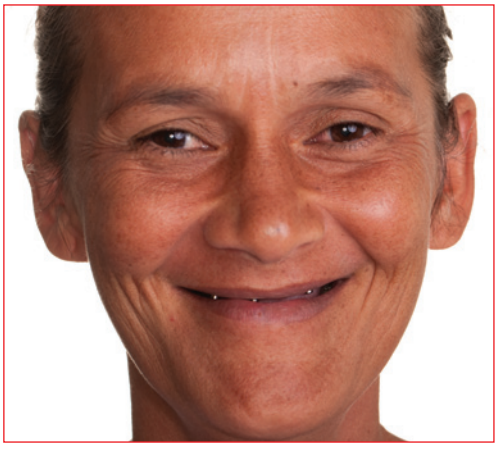


Figure 1. The female patient presented with an edentulous maxilla.

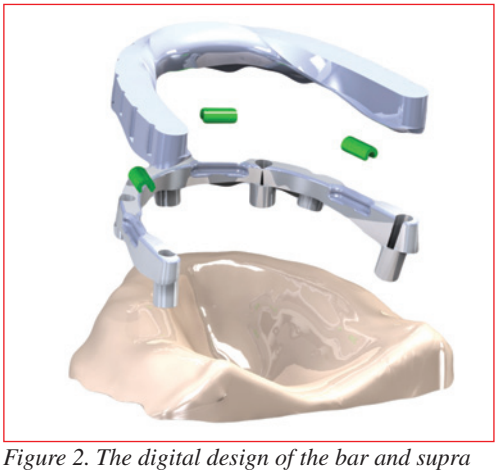
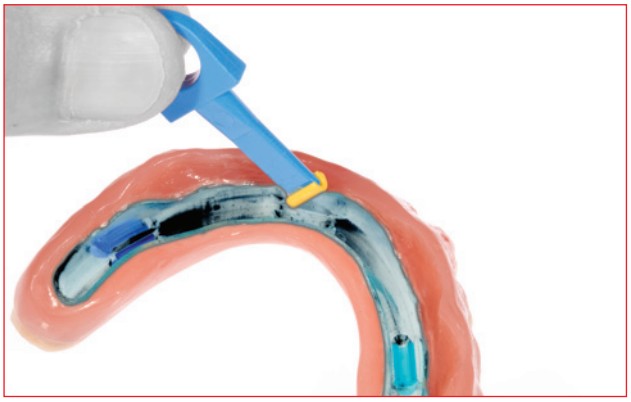
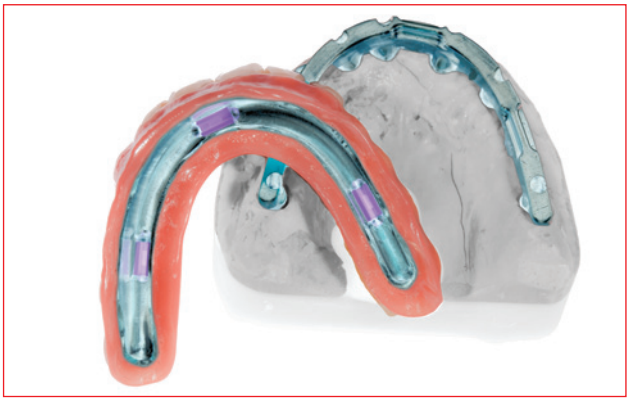


Figure 2. The digital design of the bar and supra structure were emailed to the dental laboratory.

Figures 3 and 4. After approval of the digital design, the bar and surpa structure were milled and delivered to the laboratory. The design is based on the one which has been in successful clinical use in central Europe for decades.

Figures 5-7. A set of Vita Lumin Vacuum porcelain teeth were cut back and re-staked using the Creation AV ceramic system to emulate patient specific characteristics.





Figures 8 and 9. After conventional processing, three vario soft clips were placed inside the supra structure using the provided key.

merely a half-finished product in my eyes. They didn't offer technicians a simple way of adding the removable FCD to their range of services, despite the many obvious advantages.

Sometime in August 2010, I was contacted by a gentleman who introduced himself as Michael Tuckman, a former dental technician and now engineer who represented an organization called Osteon Medical based on the grounds of Swinbourne University in Melbourne. From there on and through many hours spent on the phone and through various prototypes, Michael and I developed the first, complete CAD/CAM milled, removable FCD, based on the proven design which had been in documented, successful, clinical use for many years.[2-7]

The EasyClip concept

As mentioned above, while the manufacturing process is new, the design is not. It entails a one degree milled bar in combination with a precisely fitting female part (supra structure), both made of medically pure titanium. Three Bredent Vario Soft nylon clips provide additional retention if needed, either upon insert, in the case of a bar with minimal height due to space restrains, or when wear eventually occurs.[8] The CNC milling machines used for manufacturing are extremely accurate and yield a gap of only 35 microns between bar and supra structure. In contrast, achieving traditionally made cast metal restorations with a consistent gap of no less than 50 microns is deemed a tremendously high standard, rarely seen in most dental labs.[9,10]

Figure 10. The Candulor Easy Color kit was used to customize the pink aesthetics to suit the look of the customized porcelain teeth.

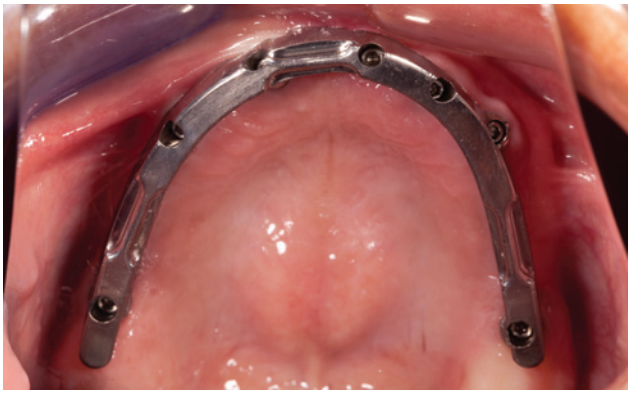


Figure 11. The bar was subsequently tried in and the fit was confirmed to be excellent.

Figure 12. The bar was manually altered to allow easy access for cleaning around each implant.

Figure 13. The supra structure was then placed on top of the bar...

Figures 14-15. ...and checked to see if the patient had any difficulties handling her new teeth.

Treatment protocol

The treatment protocol for the EasyClip bar is straight forward and unexciting. Once a tooth set-up has been verified in the mouth, it is trimmed back to the exact desired dimensions and packed up to be sent to Melbourne, along with the implant model and soft tissue mask for scanning. Shortly after, the technician receives a 3D file via email for reviewing. Only minor changes are usually required and both bar and supra structure are then milled simultaneously. Before delivery to the laboratory, matching abutment screws need to be ordered from the respective implant company, since they are not provided. The teeth are then transferred from the set-up onto the female part (supra structure). A final wax try-in is advisable before processing which can be done using traditional hot or cold curing processing techniques.

Case report

The case presented here is one of 12 clinical EasyClip bar cases which were done in my laboratory over the last six months. The female patient presented with an edentulous maxilla (Figure 1). Six Nobel Active Implants were placed. A set of anterior Vita Lumin Vacuum porcelain teeth together with a set of posterior Creapearl acrylic denture teeth were used for the set up on a light curing base, which rested on the healing abutments.

Once the set-up was tried-in and verified in the mouth, the bar and supra structure were digitally designed (Figure 2). After approval, the “hardware” was milled and delivered to the laboratory (Figures 3 and 4). The Lumin Vacuum porcelain teeth were then cut back and re-staked using the Creation AV ceramic system for customized aesthetics (Figures 5-7).

Figures 16 and 17. The patient has since continued to manage well with her new EasyClip denture.

Figures 18 and 19. The transformation of the patient's appearance and gain in self confidence are quiet apparent.

After conventional processing, three vario soft clips were placed inside the supra structure using the provided key (Figures 8 and 9). The Candulor Easy Color kit was used to customize the pink aesthetics to suit the look of the customized porcelain teeth (Figure 10).

The bar was subsequently tried in and the fit was confirmed to be excellent (Figure 11). It was manually altered to allow easy access for cleaning around each implant (Figure 12). The supra structure was then placed on top and it was checked if the patient had any difficulties handling her new teeth (Figures 13-15). Since then, the patient has continued to manage well with her new EasyClip denture (Figures 16 and 17). The transformation of the patients appearance and gain in self-confidence are quiet apparent (Figures 18 and 19).

Summary

EasyClip is a completely CAD/CAM fabricated removable FCD which consists of both a milled bar and milled female part (supra structure) as well as three Bredent Vario Soft clips. The bar provides retention, support and joins the implants. This allows for a palate-free design with labial acrylic extensions for lip support in cases where a high smile line is present.

The EasyClip bar comprises the same features as its proven, hand-made counterpart: It is removable, providing easy access for cleaning, while offering adequate sealing, good wearing comfort and good aesthetics. With the help of CAD/CAM technology, the manufacturing costs are now comparable to that of the alternative, fixed metal acrylic denture. The EasyClip bar can be constructed on both internal and external implant platforms, either direct to fixture or to abutment level with no difference in cost. The need for expensive cast-on abutments (UCLA's) or precious alloy has been eliminated which presents further savings.

Manufacturing takes place in Australia allowing for quick turn around times, cheap postage and reliable supply, without issues with Australian Customs.

Processing of the EasyClip bar is just that: Easy. Any dental technician with some basic experience in acrylic work is able to offer this new treatment option with no need for special equipment or a Master's Degree. Overall costs remain low.

For more information on the EasyClip bar, contact Michael Tuckman from Osteon Medical on 1300-411-473.

About the author

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1. Hein, S. The implant removable fixed complete denture (FCD). eLABORATE 2010; Jan/Feb 7(1);32-40.
2. Sadan A, Rogers WA: The milled implant-supported prostheses: a treatment alternative for the edentulous mandible. Pract Perio Aesthet Dent 1997 Aprl:9(3):315-26.
3. Visser A, Raghoebar GM, Meijer HJ, Vissink A: Implant-retained maxillary overdenture on milled bar suprastructures: a 10yr follow-up of surgical and prosthetic care and aftercare. Int J Pros. 2009 Mar-Apr;22(2):181-92.
4. Bueno-Samper A, Hernandez-Aliaga M, Calvo-Guirado JL: The implant supported milled overdenture: a literature review. Med Oral Patol Oral Cir Bucal. 2009 Sep 21.
5. Krennmair G, Krainhöfer M, Piehlslinger E. Implant-supported maxillary overdentures retained with milled bars: maxillary anterior versus maxillary posterior concepts – A retrospective study. Int J Oral Maxillofac Implants 2008;23:343-352.
6. Mericske-Stern R, Oetterli M, Kiener P, Mericske E. A follow- up study of maxillary implants supporting an overdenture. Clinical and radiographic results. International Journal of Oral Maxillofacial Implants 2002;17:678-686.
7. Zitzmann NU, Marinello CP. Implant-supported removable overdentures in the edentulous maxilla: Clinical and technical aspects. Int J Prosthodont 1999;12:385-390.
8. Krenmair G, Phieslinger E. Abnehmbare Implantat gestützte Oberkieferprothesen Retrospektive Bewertung zweier Stegkonzepte. Quintessenz Zahntech 2010;36(5):658-661.
9. Schunke S. Basis Wissen zur dentalen Golgusstechnik. Verlag Neuer Merkur 1997; 148-153.
10. Martignoni M, Schoenenberger A. Praezision und Kronenkontur in der restaurativen Zahnheilkunde. Quintessence Book 1990; 423-490.