The many characteristics of a long-term hybrid abutment crown

Viteo Base is the basis for the production of implant-supported single tooth restorations

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This article presents the new titanium bonding base Viteo Base for implant-supported single tooth restorations. The prefabricated prosthetic component has been specially developed for use together with ceramic restorative materials. Viteo Base has various characteristics that simplify the path to aesthetic, long-lasting implant restorations. The prefabricated connecting surface geometries are compatible with various implant systems. Viteo Base can be processed using the press technique (IPS e.max Press) and, alternatively, with CAD/CAM technology (Telio CAD, IPS e.max CAD). In the present case, the working steps involved in producing a pressed implant crown and the advantages of the Viteo Base will be shown.

Implant prosthetics is an ever-growing segment. It is becoming more and more popular to close single tooth gaps with an implant and the corresponding restoration in order to preserve the surrounding tooth substance. Modern prosthetic concepts and state-of-the-art materials enable the fabrication of functional and aesthetic restorations. Titanium bonding bases unite the advantages of a prefabricated component with those of a custom-made abutment. In a comparatively simple manner, the natural oval shaped emergence profile of the tooth is adapted to the round emergence profile of the implant. The design of the restoration and its connection to the underlying titanium bonding base are ultimately the elements which are essential for the success of the restoration.

Many characteristics, specifically incorporated to enhance the restoration material

With the new Viteo Base, the dental technician is provided with a titanium bonding base which ideally complements press and CAD ceramic systems. Viteo Base has various advantages, which will be discussed further throughout this article. The special soft edge design without sharp edges and protrusions, the recessed rotation protection and the preconditioned bonding surface of the titanium bonding base are responsible for these benefits. The connection between the titanium bonding base and the implant is certified and coordinated with the most commonly used implant systems. Viteo Base is available in two diameters: MD (Medium Design) and SD (Small Design). The chosen implant system determines the diameter to be used information on which implant system is suitable for which Viteo Base; which scan abutment is to be used, which restoration material can be applied and which Viteo Base components are available, is provided in a special combination table. This is available on the Ivoclar Digital website.

Shortening from 6 to 4 mm

Depending on the prosthetic situation, the Viteo Base can be shortened from 6 mm to 4 mm. This is carried out easily using a separating disc. A special tool, the Viteo Base Trimmer, restores the soft edge design (rounded design) for even force distribution) after the shortening process. The following case study illustrates this procedure: A hybrid abutment crown is produced using the press technique in the usual manner. The crown is created in wax on the titanium base according to the respective clinical situation, then converted into press ceramic and cemented to the Viteo Base before being screwed into the patient’s mouth.

Starting situation in the laboratory

An osseointegrated implant in region 46 required a full ceramic crown. The soft tissue was optimally shaped during the healing phase with a temporary restoration (Telio CAD). This was the ideal preparation method for an implant-supported crown made from IPS e.max Press. A screw-retained crown was selected in order to avoid any risk of mucosal cement. The master model was produced from the implant impression. A gingival mask was created to allow an exact assessment of the soft tissue situation and the emergence profile. The press technique was selected for this case, which meant that the modelled tooth shape and the occlusion could be transferred directly into the ceramic. In order to benefit from a high degree of material strength and good aesthetics, a monolithic restoration was selected.

Preparation

The titanium bonding base Viteo Base was chosen according to the implant system in size MD, then placed on top of the laboratory implant and screw-driven with a torque of approx. 5 Ncm (Fig. 2). The recessed anti-rotation protection (vertical groove) was positioned distally in the jaw for the production of the restoration. The Viteo Base can also be positioned in a mesial direction. The recessed anti-rotation protection is located vertically throughout the entire length of the shaft. It ensures that the titanium bonding base is situated correctly when it is cemented to the restoration material and it acts as a “guide.” In addition, the minimum thickness of the restorative can be maintained, the cement gap is even throughout the restoration. Stress can therefore be avoided.

The space available in relation to the antagonist tooth was ideal for the full-ceramic crown supported by a 6 mm titanium bonding base (Fig. 3).

In other cases, it may be necessary to reduce the height of the Viteo Base to 4 mm with a separating disc. The shaft height must be no less than 4 mm. This is laser-marked on the abutment shaft.

The Viteo Base Press Sleeve, a modelling aid made from acrylic, is used to support the wax crown. The adhesive surface of the titanium bonding base is preconditioned, which means it is too rough for the wax to be applied directly. This is where the Viteo Base Press Sleeves come into play. As with the titanium bonding bases, they are available in two sizes (SD, MD). In this case the sleeve diameter was size MD, to suit the selected Viteo Base (Fig. 4). The Viteo Base Press Sleeve was then shortened with a special tool, the Viteo Base Trimmer, and the shortening process was carried out easily using a separating disc. A special tool, the Viteo Base Trimmer, restores the soft edge design (rounded design) for even force distribution) after the shortening process. The following case study illustrates this procedure: A hybrid abutment crown is produced using the press technique in the usual manner. The crown is created in wax on the titanium base according to the respective clinical situation, then converted into press ceramic and cemented to the Viteo Base before being screwed into the patient’s mouth.

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Transferring the wax crown into ceramic

Ivoclar Vivadent Introduces New Full Ceramic Press System

Ivoclar Vivadent has launched the Viteo Base Press system for the fabrication of full ceramic crowns. The system provides a 1-step process from the wax crown to the final ceramic crown, with a variety of features to ensure high quality and efficiency. The Viteo Base Press is compatible with a range of other systems, allowing for flexibility in the laboratory setting.

The Viteo Base Press System consists of a base, a screw, and a pin. The base and screw are preheated and placed into the press, with the pin acting as a guide. The wax crown is then placed on the pin, and the system is pressed to form the ceramic crown. The system is designed to be user-friendly and efficient, with a simple and intuitive interface.

The Viteo Base Press System offers a number of advantages over traditional ceramic press systems. Firstly, the system is designed to ensure a consistent and high-quality result, with improved esthetics and wear resistance. Secondly, the system is designed to be user-friendly, with a simple and intuitive interface that allows for easy operation. Finally, the system is designed to be compatible with a range of other systems, allowing for flexibility in the laboratory setting.

The Viteo Base Press System is available in a variety of sizes and configurations, allowing for flexibility in the laboratory setting. The system is designed to be easy to use, with a simple and intuitive interface that allows for easy operation. The system is also designed to be efficient, with a fast and reliable press cycle.

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Finishing the crown/individualization

The pressed IPS e.max crown was stained with the universal stain and glaze range of IPS Ivocolor (Fig. 18). A warm colour was applied to the central fissure to give the impression of depth. The cusp tips were accentuated with white (Fig. 19). A wash of blue stain was gently added to the initial area to intensify the translucency of the crown. After the stains had been fixed, the IPS Ivocolor Glaze Paste was applied to the crown and Glaze firing was carried out. The contacts were then checked again in the articulator.

Permanent cementation of the prosthetic implant restoration (Fig. 20)

The cementation process of a ceramic crown and titanium bonding base is a delicate working step, which requires high precision. Since the Viteo Base is already presanded, it does not have to be sandblasted before cementation. This saves one working step and therefore saves time. Nevertheless, this does not apply if the abutment was shortened. The shortened surfaces have to be re-sandblasted in order to achieve an ideal bond and a good marginal seal. In this case, however, the Viteo Base was used with a 6-mm shaft height and was not shortened. The titanium bonding base was immediately cleaned in the ultrasonic bath and thoroughly rinsed and dried. Next, Monobond Plus was applied to the ceramic surface and allowed to act for 60 seconds. Any excess was blown away. Alternatively, the innovative single-component primer Monobond Plus can be used here: It etches and silanizes the glass-ceramic surfaces in one working step. Before cementation, the screw channel had to be closed in order to prevent composite residues from falling into it. The Viteo Screw Channel Pin was used for this purpose. For easier handling, this was shortened and then inserted into the Viteo Base screw channel.

The IPS e.max Press ceramic structure was bonded to the Viteo Base using the Multilink Hybrid Abutment self-curing luting composite, which is specifically developed for the permanent cementation of ceramic structures to titanium/titanium alloy bases. It is available in two levels of translucency. In this case we used the version with a higher degree of opacity (MDX) (Fig. 21). The Multilink Hybrid Abutment composite was applied to the bonding surface of the Viteo Base and to the inner surfaces of the ceramic object. Thanks to the previously applied mark pen, both components could be easily placed in the correct end position. The restoration protection, which runs along the entire length of the shaft, acted as a guide.

Both components were firmly pressed together for five seconds. Any excess composite – a gel-like consistency – was removed with an instrument during the setting phase (Fig. 24). The application of Liquid Strip glycercine gel on the joint prevented an inhibition layer from forming during setting. After seven minutes, the glycercine gel was rinsed off with water and the Viteo Screw Channel Pin was removed from the screw channel. Finally, the joint was carefully smoothed over with a fine rubber polish at low speed (5,000 rpm) and gentle pressure. In order to leave the connection to the implant as untouched as possible, it is advisable to leave the Viteo Base in the Viteo Holder, or at least screw it onto the laboratory implant. The restoration was polished with goat hair brushes and universal polishing paste (Fig. 26). A smooth and homogeneous surface is important, so that the gingiva can adapt properly to the restoration.

Inserting the prosthetic implant restoration

The assembled and cleaned hybrid abutment crown was prepared for insertion in the mouth. It is advisable to autoclave the hybrid abutment crown prior to intracoronal insertion. The temporary Telio CAD restoration in region 46 was removed by the dentist, the implant lumen was flushed (Cervitec Liquad) and the peri-implant tissue (emergence profile) was examined. The crown was screwed to the implant using the originally packed Viteo Screw. It was tightened according to the torque (e.g. Multilink Hybrid Abutment) which is specified by the manufacturer. By screwing the crown in place instead of cementing it, the risk of cement residues in the peri-implant area could be excluded. The screw channel in the occlusal area was sealed with the light-curing esthetic composite IPS Impress Direct.

The restoration adapted harmoniously to the surroundings in the mouth in terms of its shape, shade and function. The emergence from the soft tissue corresponded to that of the natural dentition thanks to the prepared emergence profile and the individual design of the structure (basal).

Conclusion

Ideally coordinated with ceramic materials

The Viteo Base is ideally suited for use with ceramic materials. It helps to avoid chipping problems, the lack of or weakness of a bond or inadequate force distribution. One of the advantages of the Viteo Base is the special soft edge design without sharp edges and projections, which on one hand strengthens the restoration material and on the other hand provides optimal force distribution under pressure.

The preconditioned, in other words sandblasted surface saves an additional working step and therefore saves time. In combination with the appropriate composite system, it ensures a secure connection of the titanium base and the restoration material. This is a key factor for the longevity of the restoration and its integration into the oral environment. Due to the industrial preconditioning the surface of the Viteo Base is very uniform. Together with the appropriate composite (e.g. Multilink Hybrid Abutment), it ensures a permanent marginal seal. The recessed rotation protection means the cement gap is very even. Compressive or tensile stresses are avoided. The restoration material is strengthened.

In addition, the Viteo Base’s shaft height can be easily adjusted to suit the prosthetic restoration. It can be shortened from 6 mm to 4 mm. As a result, optimal support of the restoration material is achieved by the titanium bonding base. The restorative material and the Viteo Base together form a coordinated unit and are the basis for clinical success.

In the production of an implant-supported single-tooth restoration, the Viteo Base components enable a smooth manufacturing process. In this present case, a hybrid abutment crown was produced in IPS e.max Press using the press technique. The ceramic crown, produced in the conventional manner, was cemented to the Viteo Base. The recessed rotation protection acted as a guide. An ideal bond was achieved with the appropriate materials for conditioning and placement. The hybrid abutment crown was screwed in place in the mouth. It fits harmoniously into the overall appearance of the mouth.
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