SPECIFIC ARTICLE: MAMMA LUCA

Saga Zirkonia - Zirconia update from Zirkonzahn

Aldo Zilio

The PRETTAU Bridge is a novel type of implant restoration: A zirconia bridge milled to full anatomical tooth contour - Guaranteed NO chipping!

Fig. 1: *Original situation: Full acrylic denture*

Porcelain chipping - the dirty word and most clinicians' phobia. The dreaded cusp shear within the layered veneer ceramic. A symptom that frequently occurs with implant restorations.

Lack of occlusal load-control (no nerve endings to implant abutments) as well as flaws in frame-work design or inadequate veneer porcelain support cause such failures. The exciting possibilities of this new material are demonstrated in Aldo Zilio's PRETTAU Bridge for 'Mamma Luca'.

Aldo Zilio lives in Creazzo - Italy, half way between Verona and Venetia. In Venetia one finds more than four hundred bridges, a lot of them not even known by name. Many lead the visitor into glorious palaces. These bridges, though historic monuments in their own right, worthy of admiration, are often barely noticed by the casual passer-by. Not so the PRETTAU Bridge: The new full anatomical-contour milled zirconia restoration after Enrico Steger seems already assured fame & glory but see for yourself. Aldo Zilio's case presentation points the way in modern oral bridge design:

'Mamma Luca' has seven upper implants in the area of 15- 25. Plenty of foundation for Aldo Zilio's PRETTAU Bridge spanning from 16- 26. The implant abutments in place between 13- 23 are connected by a bar; 15, 24 and 25 have been fitted with single primary zirconia copings.

Fig. 2: *Designer Zirkograph*

Enrico Steger sets new standards with his Zirkograph and the tight quality control of ZIRKONZAHN zirconia with its constant non-variable shrinkage factor.

The new ZIRKONZAHN PRETTAU Zirconia marks a significant technological advance indicated for full anatomical-contour milled crowns and bridges.

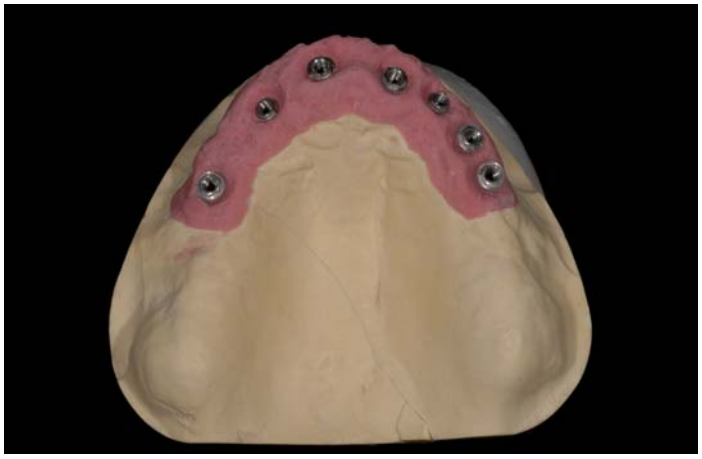

Fig. 3: *Master model with implants*

Work base for the PRETTAU Bridge is a master model with gum key and a diagnostic wax-up establishing position, occlusion and aesthetics.

Fig. 4: *Diagnostic wax-up*

The entire wax up is duplicated and transformed into a rigid mock-up frame using shrinkage-free ZIRKONZAHN FRAME resin. At this stage a try-in is carried out on the patient to confirm tooth shape, aesthetics, phonetics and functional movements.

Fig. 5: *Duplicate in FRAME resin*

Bar and primary copings are then milled out of this full-contour resin duplicate. That way the primary substructure's size and position can be determined accurately.

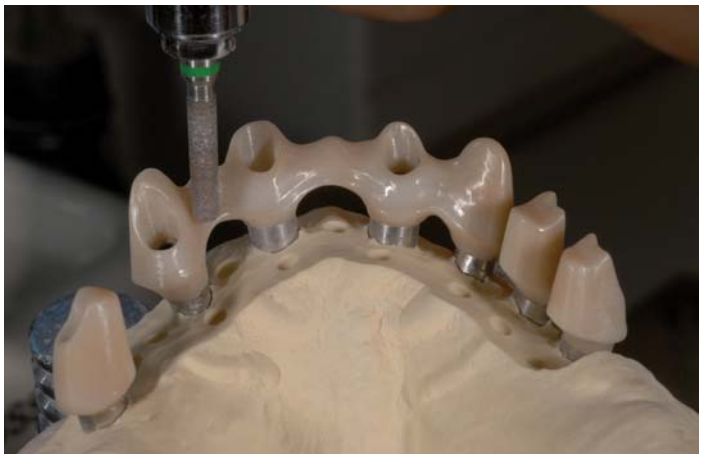

Fig. 6:*Bar milling*

After sintering, the bar is refined and parallel-milled with special tools in a surveyor-type milling machine using water-cooling. Finally the entire substructure, bar and primary copings, are polished to a mirror-finish.

Fig. 7: *Bar & primary coping try-in in situ*

Fig. 8: *Resin duplicate for bridge milling*

Next, the primary parts are fastened to the model and blocked out where necessary before a second full anatomical-contour resin frame is duplicated over the top: The actual mock-up frame for milling the PRETTAU Bridge.

Fig. 9: *Anterior resin teeth 'prepared' - create space for veneer porcelain*

Aldo prepares (cuts back) the anterior resin teeth in places he wants to layer veneer porcelain later on. The canines are only prepared labially - the lingual surfaces to be left in solid zirconia for canine guidance. All posterior teeth are kept in full anatomical contour.

Fig. 10: *Mock-up frame placed in milling template*

Template positioning and milling with the Zirkograph proceeds in the usual manner. After trimming and refining the milled bridge at the green stage the pre-sinter colouring follows: The artistic part of the procedure.

Fig. 11: *Coloured and sintered frame work*

Fig. 12: *From the sinter furnace straight onto the model*

Pre-sinter colouring zirconia is an intriguing new and part chemical process. Finesse and know-how are required in creating the desired life-like shade detail. Natural tooth colour and shade graduation are achieved by application of ZIRKONZAHN COLOUR LIQUIDS in a varying number of layers and different concentrations. This creative process requires focus. Accomplished best in an environment uninterrupted by phone calls or other distractions!

Fig. 13: *ICE Zirkon Ceramics*

Fig 14: *Outstanding fit on the model as well as*

To date it has not been possible chemically to create a true pink Colour Liquid for the gingival parts. However, the available mauve tone provides a perfectly adequate support base for the seven different ZIRKONZAHN ICE pink veneer porcelain shades.

Fig. 15: *… in situ*

With ZIRKONZAHN the 'morning after' (after sinter-fire) is always a rewarding experience: The immediate bridge-to-model fit is outstanding. A true "WOW" effect. Any adjustments required are usually done within minutes. In situ the bridge fits just the same (remember the initial try-in at mock-up stage to confirm fit) One is tempted to feel like a hero already.

One last step to completion:

To layer the front teeth with veneer porcelain and create a natural looking gingiva is sheer pleasure because there is zero creep in zirconia frame-work. Which technician doesn't remember those sleepless nights casting and soldering 14-unit metal bridges?

Fig. 16: *Anterior dentin and gingiva bake*

Zirconium oxide is a poor heat conductor. Firing large-size bridges requires special attention with regards to heat rise and holding temperatures.

Fact: Most porcelain manufacturer's firing instructions are only suitable for single crowns. Even a small 3-unit bridge with a large pontic can be positively under-fired if conventional firing programs are followed.

Fig. 17: *Enamel bake*

The maximum heat rise for a PRETTAU Bridge is 35 degrees/min. Holding time should be at least 2 minutes to avoid serious veneer porcelain under-fire. Failure to observe these rules results in weak veneer layers prone to shear fracture

Fig. 18: *Stained and glaze fired PRETTAU Bridge*

After the anterior teeth and gingiva are layered and fired, staining of the posteriors and lingual surfaces follows using ZIRKONZAHN ICE ZIRCONIA STAINS.

The first stain fire is a 'freeze' bake to fix the stains in place. In the second fire glaze powder is applied over all un-veneered surfaces. Afterwards some manual polishing with diamond impregnated tools may be required. The PRETTAU Bridge is complete

Fig. 19: *The fitting surface*

Abb. 20: *Perfect bridge join to primary zirconia parts*

Using the new ZIRKONZAHN PRETTAU Zirconia, optimal aesthetic results can be achieved without technical or aesthetic compromise between anterior and posterior teeth. The wider applications for single crowns (in lieu of FG - full gold) or zirconia inlays/onlays are obvious.

Aldo's PRETTAU Bridges are actually suitable for permanent cementation because biocompatibility of the material and pontic design allow it. Though, commonly cementation with temporary cement is the preferred method with view of retrieving and servicing the restoration in time.

Fig. 21: *Lateral view*

Fig. 22: *Occlusal view*

Fig. 23: *A stunning new smile*

Is Mamma Luca just one rare lucky patient living happily ever after? Is this story only a tooth-fairy tell tale? Not so!

It is the new reality thanks to trail blazers like Aldo Zilio, made possible by ZIRKONZAHN pioneering zirconia technology.

Fig. 24: *Figture of Mamma Luca*

This case was milled with the manual ***ZIRKONZAHN*** *zirconia milling system.*

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