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Cross-Pinning; *The application of retrievability utilizing tap and screw procedures.*

The technique of cross-pinning using a transverse screw to fasten a prosthesis to a custom pre-fabricated abutment allows retrievability in all situations including misalignment. The most important reason to consider this technique is the complex pathologies and interactions between the peri-implantitis and chronic periodontal diseases. Understanding the clinical complications most certainly challenges the judgment in permanently cementing an implant supported restoration.
The frequency of technical and clinical difficulties that encompass dental implants can be expected.

The clinical ramifications, biological disturbances of the surrounding tissue involve the mucosa (peri-implant mucosistis), soft tissue laceration, such as gingival proliferation, fenestrations, dehiscence, fistulus and peri-implantitis (inflammatory bone loss). These clinical disorders may affect the success of a cemented implant supported prosthesis.

A study by Berglundh and associates suggest that 6.5% of patients with implants go through soft tissue difficulty (peri-implantitis) and/or 2.5 mm or more crestal bone loss after a 5 year function. Klinge and associates mention their results of progressive bone loss in which 27.8% of patients accounted for 12.4% of implants with progressive bone loss. It seems there are a few people who are more susceptible to peri-implantitis than the majority of the population.

Technical complications of cemented implant supported restorations are also normally reported which includes acrylic veneer fracture, ceramic veneer fracture, aesthetic deficiencies, phonetic difficulties, restoration and abutment screw loosening, restoration screw fracture metal or zirconia framework fracture and implant failure. Clinically and technically it makes good sense to be able to detach implant supported restorations, without damaging or destroying the prosthesis.

This cross-pinning technique provides the clinician with the ability to retrieve the restoration, which otherwise, by being cemented would be detrimental to do. The method of cross-pinning is accomplished by usage of a transverse screw which will attach the restoration to an implant abutment when access for aesthetics or the structural integrity would be compromised.

Also cross-pinning offers retrievability of the restorations regardless of adverse axial alignment. The technique requires the use of a transverse screw (Bredent) and also a customized or stock implant abutment to produce an aesthetic, retrievable prosthesis. The cross-pin provides security of the restoration along its path of insertion. This provides the titanium cross-pin protection from destructive occlusal forces.

The screws used in cross-pinning procedures are in general much smaller than abutment screws. Typically these types of screws are not able to withstand occlusal forces without protection from the crown-abutment fixation. However, the Bredent transverse titanium scews have been designed to avoid shear stress because the head of the screw is lowered 0.3mm into the substructure (abutment). Also the grade 5 titanium has a shear strength at the head of 155 kg of force. Resistance form is the feature of an implant abutment's shape that prevents dislodgement of the prosthesis along the axis other than its path of insertion.

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Bredent's Titanium Screw is ideal for cross pinning.

Inside this Issue ...

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Hollow Pontics - Save Money on the High Cost of Gold!

The hollow pontic technique was developed to eliminate the inconsistencies and problems associated with conventional crown and bridge fabrication. Each hollow pontic reduces the amount of gold used by a whopping 58%; the savings in cost for your clients and their patients is quite significant.

Some of these are contraction cavities, non-homogeneous stresses, cracked connectors, instability and differences in thermo expansion during firing between crown and pontic because of excessive weight when using precious metals.

The object of this technique is primarily to produce crowns and pontics with "balanced" volumes after casting. In order to achieve this, the pontics were designed to be hollow. During solidification of solid pontics, a contraction process is initiated which leads to metal being drawn away from the thin sectioned, adjacent crown to the centres of the solid pontic. Therefore, in cases involving large pontic construction surface defects such as porosities and contraction cavities can be caused around the connection of the sprue to the pontic. What will occur in any case is that the cast structure of the connectors between the separate pontics will not be homogeneous. This together with micro-fine or even visible cracks can lead to a cumbersome loss of stability.

Another development to counter act porosity and improve micro grain structure of the metal is a "square" sided spruing wax called "Quadro Spool Wax". Research confirms that round conventional sprues create turbulence in the metal as it spins through the sprue channel. The square sided Quadro sprue prevents circumferential spinning and forces the metal to flow into the center as the gas air flows into the square corners and escapes freely reducing turbulence in the sprue channel. The result is a finer and more condensed micro grain structure of the metal. Hollow pontic wax units provide contraction and stress free metal sub frameworks. As the volumes of the cast crowns and pontics are well balanced, thermo expansion and many other problems disappear as well as reducing 58% of the metal used for pontics.

Bredent's **Hollow Pontic Blocks hpbl - top view of anteriors.**

Bredent's **Hollow Pontic Blocks hpbl - side view of posteriors.**

Bredent's **Hollow Pontic Blocks hpbl - top view of posteriors.**

"The Hollow Pontic Technique eliminates contraction of cavities, non-homogeneous stresses, cracked connectors, instability and differences in thermo expansion during firing between the crown and pontic.

This technique produces crowns and pontics with balanced volumes after casting." Source; Peter T. Pontsa, RDT

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Product Show Case: Bredent's Diatit Multidrill Set Screw System

Precision Lingual Set Screw Attachment

- ✓ Ideal for Retrievability of Implant Supported C & B work.
- ✓ Available in 1.4 mm or 1.6 mm.
- ✓ 4 different lengths depending on the application.
- ✓ Bio-compatible titanium screws.
- ✓ Conical screw head has a self-locking effect.
- ✓ Drill exact holes in all types of alloys.
- ✓ Zirconium Set available in 1.4 mm.
- ✓ Licensed according to Health Canada Regulations.

The 1.4 or 1.6 mm kits contain: 1 Tungsten carbide centre drill, 1 Tungsten carbide facing cutter, 1 Diatit Multidrill Stop Drill, 1 Diatit Multidrill, 2 Titanium screws, 1 M V first tap, 1 M F second tap, 1 tap Holder, 1 Screwdriver.

33000600 1.4 mm kit
33000016 1.6 mm kit
33024324 zirconium set

For more details contact us at 1-800-250-5111.

Cross-Pinning; *Retrievability utilizing tap and screw procedures..* ...cont'd

The custom abutment is perforated with the Diatit drill.

Gently tap with the First Tap and then the Second Tap.

Both screws are tested for accuracy and accessibility.

Axial grooves provide additional resistance form and should be added when wall thickness is adequate. Cross pin screws may be difficult to position if the path of insertion is limited by the adjacent anatomy. The dental technologist should be cognizant of these conditions and provide adequate access. For example a lower molar transverse screw is easier to position into the mesial-lingual area angulated to improve access. Any shear stresses between the abutment and the secondary element will not be transferred to the thread of the screw but to the screw head which features much more stability because of the 8º morse taper.

The tapered head of the titanium screw makes it less susceptible to screw loosening than a conventional screw due to greater surface area and the surface grip of the tapered surface. The technique begins with a custom abutment, the tap and screw assortment kit has a centering drill and a diatit bur to penetrate the abutment in the selected area.

The first tap is placed in the holder, then cut the thread into the implant abutment by hand (clockwise rotation) without exerting pressure, while applying a small amount of milling oil. Two clockwise turns, then counter clock wise to remove the tap and clean off the metal chips. Continue this process until the 1st tap totally penetrates the abutment wall. Remove the first tap, replace it with the 2nd tap and re tap the hole again to create the final thread.

Carefully remove metal chips and oil residue. Screw in the titanium screw and proceed to wax the framework. Remove the screws and invest and proceed according to the standards of practice. The technique for cross-pinning CAD-CAM or pressible ceramics of the screws reflects current best practices in terms of treatment planning which provides quality, value and long service life. The titanium screws are produced with utmost precision in an industrial process of CAD-CAM milling using grade 5 titanium. All four screw heads incorporate a six sided (hexagonal) drive which use a universal screwdriver.

The four different screws offer variable lengths and thread gauges which clinicians and technologist can utilize in various options in retention to prosthesis design and treatment planning. The pitch of the screw head has been selected so that friction is sufficient to prevent linear motion being converted to rotary, so that the screw does not slip even when linear forces are applied so long as no external rotation forces are present.

This allows the prosthesis to be firmly fastened to the implant abutment until the clinician removes the screws to examine the prosthesis and evaluate the implant and soft tissue. In conclusion biological and technical complications have been reported in dental literature and this often compromises the functional and aesthetic features of fixed implant supported prosthesis. Numerous restorations that are placed by clinicians are cemented permanently and that may place the implant in peril since the restoration would have to be destroyed in order to be removed. Managing biological and technical complications

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The screws offer variable lengths for all applications.

The bridge is waxed around the screws, then removed prior to investing.

The screws can be shortened to the lingual aspect.

NOTE: These pictures were photographed by Peter T. Pontsa, RDT.

Cross Pinning; *The application of retrievability utilising tap and screw procedures ...cont'd*

without destroying the prosthesis is an obvious advantage of implant based dentistry, where the option of prosthetic retrievability is vitally important.

Source; Peter T. Pontsa, RDT

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About Our Organization...

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Hollow Pontics - *Save Money on Alloy!* ...cont'd

Hollow pontics are an excellent candidate for the pressible ceramic technique. In a situation where a metal sub frame is going to be used as in the (PFM) technique certain precautions should be taken. The finish line should be placed at the joint of the axial walls with the shoulder. This allows for butt joint ceramic margins, and prevents metal showing through and contacting the oral tissues.

Semi-precious, precious alloys and non precious metals can be used with pressible ceramics, however we must respect the coefficient of the thermal expansion and make sure that there is a compatible factor at work in order for success. Normally the framework is opaqued including the area inside the hollow pontic: Using the adaptive wax technique apply ash free wax and replicate the finished porcelain. Ash free wax leaves no residue in the mould after burn out. The wax up can be done in the cut back method or for full contour. This depends on the ensuing technique of layering or external staining.

The lost wax method incorporating hollow pontics ensures absolutely no porosities and zero shrinkage of the pressed ceramic restoration. In the traditional method the hollow pontic usually is filled and baked before applying the opaque. There is also a method where rods of varying size of ceramic, using opaque and dentine are baked before and inserted into the hollow pontic at the wax up stage and cast directly to the metal. This saves time for the ceramist to fill the hollow.

The pressible ceramic technique is far more superior in regards to filling the pontic in the immediate pressing of the ingot. Also a study entitled "Comparison of Tensile Bond Strength of a Pressible Ceramic to Metal" has shown that the tensile bond strength of the pressible ceramic to the metal sub frame has been measured and found to be equivalent to that of feldspathic porcelain.

Another use for hollow pontics is implant related. When waxing up single units or bridges over plastic cylinders, like the UCLA abutment, just slip a suitable sized hollow pontic over the cylinder and fill any voids between the wax pontic and the cylinder wall. This will cut waxing time considerably and is cost effective. The hollow pontics are available as a mini kit or in larger assortments. They come in 1x4 blocks while the Quadro wax sprues are in rolls and come in three sizes.

Source: Peter T. Pontsa, RDT

Reference: Comparison of Tensile Bond Strength of Press Ceramic to Metal vs. Feldspathic Porcelain Fused to Metal. D.M.Schweiter, G.R. Golstein, N.R.F.A. Silva, J. Legeros, E.L. Hittelman. J. Dent. RES. 82, B-181-2003

Trade Show News and Announcements

DENT*Atlan*-TECH will take place at the Lord Nelsen Hotel & Suites in Halifax on September 7th & 8th. Please join us for a great educational format. Dent-Line will be sponsoring a lecture called "Attachments; Fixed and Removable Prosthetics" which will be presented by Peter T. Pontsa RDT. For further information contacts us at 1-800-250-5111.

Dentechnica du Québec has changed venues and will be held in Montréal. This is the only dental technology show in Québec and the new location provides better access to the convention hall. It will be held October 26th and 27th at the Palais des Congrès de Montréal 1001 Place Jean-Paul Riopelle in Montréal's downtown core. There is free admission to the Friday night cocktails and the lectures will include subjects such as ceramics, Cad-Cam, attachments, removable prosthesis and implants. Dent-Line will sponsor the lecture "Attachments; Fixed and Removable Prosthetics". For more details about DENT*Atlan*-Tech or Dentechnica du Québec contact Palmeri Publishing at 1-905-489-1970.