



## Retentive and Stabilizing Properties of the Exchangeable Stud Bond-In Attachment

Dental rehabilitation requires careful attention and meticulous treatment planning. Successful restorations can be done efficiently with accepted procedures and conventional treatment planning. Semi-precision

attachments for RPD usage is one such treatment modality that is commonly used in prosthodontics. Studies have also demonstrated that semi-precision attachment partials last longer, wear less, need less adjustments, are aesthetically pleasing and are very hygienic. Both long term and short term circumstances could significantly benefit patients with this type of treatment plan. This case study will profile the Bredent semi-precision exchangeable stud bond in attachment fused to porcelain metal restorations (PFM).

The purpose of this article is to provide the dental health practitioner with an analysis on bond in semi-precision attachments and a flexible approach to treatment planning.

A removable partial denture (RPD) with a retained attachment system is a treatment modality that can assist in both functional and aesthetic substitution of missing teeth and oral structures. The few analytical studies readily available show a survival rate of 83.3% for 5 years, 67.3% up to 15 years and up to 50% when projected to 20 years.

One of the many advantages of the stud type attachment is that it promotes exceptional oral cleanliness, at the same time the crown root ratio is enhanced along with a low profile. Aesthetics and ease of handling for the patient is the primary indication for treatment planning in RPD attachment cases. Therefore the abutment tooth must have sufficient crown height to secure the attachment mechanism and neutralize the leverage forces that are applied on the crown.

Suitable attachment selection depends on three evaluation factors, these involve; location, retention and available space. As part of the technical procedure the assistance of a surveyor and/or milling machine, will aid in a suitable path of insertion that must be calculated to establish appropriate guiding planes.

Extra coronal attachments are normally resilient and are recognized for



**Bredent's Exchangeable Bond-In Stud**

appearance, convenience, and efficient functioning designs which require minor tooth preparation of the abutment tooth. While intracoronal attachments are more rigid with a potential to harm the pulp through endodontic injury based on the type of preparation of the abutment tooth. Stress breaking characteristics in distal extension situations provide a great advantage to the extracoronal resilient design.

A study by M. Wichmann, DDS and W. Kunz, DDS "Wear Study of Attachments" *Journal of Prosthodontics*, 12: 404-9, 1999 has discovered that conventional metal attachments showed substantial wear and retention loss. By contrast, the plastic attachments showed only inconsequential friction loss and the most consistent retention force. In addition, replacement of the plastic inserts restored friction to the initial manufactured retention.

The study concluded wear induced loss of retention in attachment retained dentures poses a major clinical problem. To counteract this unwanted effect, most prefabricated precision attachments can be activated to restore wear induced loss of friction. This is achieved by design elements such as resilient metal tongues, partially or completely slotted male

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## *Dent-line of Canada Inc., has been acquired by Central Dental Ltd.*

With over 22 years at the helm of Dent-Line of Canada Inc., it is with thoughtful contemplation and consideration that Peter T. Pontsa RDT President and Angela van Breemen B.A. Vice President have decided to retire. Peter and Angela started Dent-Line as an independent boot straps dental supply company in 1991, representing Bredent and Renfert. Prior to starting Dent-Line, Peter had spent most of his dental technology career dealing with complex attachment cases and since Bredent was not represented in Canada, he felt that their attachment line would be easily and well received in Canada. Angela, with her extensive background in marketing and bookkeeping was also a driving force within the company. It's been a great business and neither of us would have chosen to leave unless we knew that the business would be passed on to a company like Central Dental, that shared our passion for customer service.

Peter and Angela have many fond memories of the friendships we developed with our customers, distributors and

our employees both past and present. We have endured through good times and bad within the dental industry and have developed a unique company that is recognized not only for its breadth of offerings but for the integrity, expertise, customer care and dependability. These are truly the values that we have brought to work each and every day.

After a year of confidential negotiations with Joe and Laurie Smith we have sold Dent-Line of Canada Inc. to Central Dental Ltd. The official date of transfer of ownership is April 22nd, 2013. We approached the Smiths because we felt they embodied the character, values and the philosophy that would complement the way we do business. They will continue to offer the same business model that has made both Central Dental Ltd. and Dent-Line of Canada Inc. a success.

Peter has spent the last four months training Ljepa Katanic, the new Technical Product and Attachment Specialist with a hands on approach to all the technical

aspects of dental attachments and much more. During their retirement Peter and Angela are not planning anything but a long rest, with Angela once more taking up her brushes, oil paints and easel, while Peter intends to tinker and drive his antique cars. Finally, we would like to thank all our customers for their loyalty and support over these past 22 years. With humble thanks and gratitude,

*Peter and Angela*



**The changing of the guard: Mr. Joe Smith and Mr. Peter T. Pontsa, RDT finalize their agreement.**

## **Product Show Case: Easy Snap Locking Pin E**

Bredent has perfected the Easy Snap so that it provides more reliability in the retention of the denture. This distinctive snap when the rear axle is opened and closed facilitates easier handling by the patient.

When the lock is opened, the locking pin cannot be pulled out. The result of the improved Easy Snap is due to the collaboration with the University of Applied Sciences of ULM, Germany. The research into materials for the snap ring and corresponding functional tests have been accomplished in order to solve the complicated withdrawal of the pins.

A new material has now been manufactured for the snap ring, which by far exceeds the parameters of the original Easy Snap E device. The function of the locking pin was simulated in a series of tests over a period of six years. As a result of the change in the material of the snap ring, the lock shaft can now only be extracted with an increased force of approximately 6 kg. The new material offers an improved sliding action which is a more satisfying function for patients when opening and closing. Concurrently, the spring force is improved due to the new and improved chemically resistant high density thermoplastic resin. Since the thermoplastic resin does not absorb

any water or unintentional maceration caused by saliva, it retains its high strength for superior sliding properties.

The dimensions of the Easy Snap Locking Pin E are the same as those of the original Snap System Locking Pin. The Easy Snap Locking Pin E and the Snap System Locking Pin can be distinguished from one another by an indentation made on the easy snap locking pin. The new locking pin Easy Snap E is pushed into the ready made sleeve using the angled insertion tool. The snap ring immediately assumes the correct position.

The lock shaft can then be easily pushed in, due to the slight bevel on the lock shaft. Initially it snaps into place in the first depression, on the lock shaft which corresponds to the open position of the lock. When the lock shaft is pushed in further, the snap ring expands apart until it snaps into place in the second depression which indicates the closed position.



**More reliability for the patient**

### **ADVANTAGES**

- ✓ Maximum range of functions of the locking pin enables the use in high-quality restorations.
- ✓ Ease of use in handicapped patients who exhibit poor manual dexterity.
- ✓ Simple integration contributes to fast processing.
- ✓ Increased stability to avoid undesired removal and to offer additional reliability.
- ✓ Simple exchange of the snap ring reduces waiting times for the patient.

## Retentive and Stabilizing Properties of the Exchangeable Stud Bond-In ...cont'd



The wax miller begins cutting the lingual facing to approximately 1.5mm with a speed of 5,000 to 7,000 RPM.



To prepare a milling model, the crowns are removed from the master model with a transfer device and placed in wet plaster after being pinned.



When the plaster is set, the profile shoulder and groove bur are brought into play to refine the PFM crowns.

components or set screws. Over time, activation of these metal male components will induce fatigue of the metal alloy followed by breakage of the retention elements, if they have not already worn out during

daily function. The question is then how costly will it be to replace the existing attachment or should a different approach be considered? One of Bredent's innovations has revolutionized attachment systems. The exchangeable stud has been constructed with a threaded screw with hex located at the head of the stud, which can be screwed in or out of the restoration when necessary. This exchangeable stud is available in 2.2 mm and 1.7 mm and can be used vertically with the OC retention sequence or horizontally with the SG retention sequence.

The exchangeable stud can be replaced intraorally when it becomes worn out or when the plastic retention sequence green, yellow and red have become exhausted and have to be replaced. Bredent has now extended the retentions up to six extra levels of retention above the original three.

Indications for use are bilateral removable partial dentures; implant bar supported over dentures and root cap treatment over dentures. The exchangeable stud is made out of titanium, whereas the retaining housing is offered in platinum/iridium or gold /platinum/palladium.

For a more cost effective approach, Bredent also offers a prefabricated, bond-in housing in titanium alloy which can be bonded in to the crown or bar. The benefits are that there is no need to invest the gold alloy housing where it can be damaged by divesting or through the process of casting gold alloy on to

the manufactured alloy housings where there can be a change to the physical properties of the attachment housing by thermal heating whether by soldering or casting.

For dental technologists not experienced in alloy to alloy casting techniques, the bond in titanium housings is a more secure and predictable procedure. Bredent's DTK adhesive is a glass ionomer based adhesive that is recommended for this technique since it has a flexural strength of 80 MPA and an adhesive strength of 350 Newtons. The adhesives available today are organic compounds that have been synthetically altered. Generally two compound adhesives are used, such as paste to paste or liquid. They are usually cured by chemical reaction when mixed together, cold cured or by ultra violet light.

In order to create the receptacle for the attachment, the auxiliary modeling component is utilized in the waxed up crowns on the distal aspect. The technique requires a milled rest to act as a stress breaker. The interlock is drilled with 1mm wax miller and its position is predetermined at 180 degrees off center of the male attachment. The next step is to use the wax miller and starting from left to right at a speed of 5000 to 7000 RPM, begin cutting the lingual facing to approximately 1.5 mm in depth. Then the shoulder rest is also cut just above the lingual facing. After spruing and casting

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After screwing in the stud, the housing is secured in the parallel mandrel and the fit is tested.



The DTK adhesive is mixed one to one and placed into the receptacle.



The housing is gently guided into the receptacle and allowed to cure. Excess material is removed prior to applying the ceramics.

NOTE: Photography by Peter T. Pontsa, RDT and technical work by Ljepa Katanic, Technical Product Specialist.

## Retentive and Stabilizing Properties of the Exchangeable Stud Bond-In ...cont'd

the crowns, the standard of practice is to prepare a milling model so subsequent milling of the stress breaker can take place on the porcelain to metal crowns. All milling burs beginning with profile, shoulder and groove milling burs are brought into play to refine the milled ledges. The crowns are then carefully removed from the milling model and placed on the master working model.

The exchangeable stud is screwed into the titanium bond in housing and secured into the parallel mandrel. It is slowly placed into the receptacle to check accuracy of fit. On acceptance, the DTK adhesive is dispensed and mixed together in a 1 to 1 ratio. The guiding plane surfaces and the parallel mandrel should be isolated with FPG isolating agent to prevent sticking. Then a small amount of the adhesive is applied into the receptacle and the attachment is guided into position. Excess adhesive material is removed from the attachment and mandrel and the attachment is allowed to cure. At this stage, it makes prudent sense to unscrew the exchangeable stud and check for accuracy and precision before applying the ceramic veneer.

In conclusion, it can be said that the stud type attachments have a retentive and stabilizing properties which are dependent upon the patients' dislodgement patterns. Being knowledgeable about retention,

stabilizing properties and aesthetics will possibly assist in proper selection of semi precision attachments. The exchangeable stud can be replaced when worn, thus extending the life of the restoration. The *nine* retention levels also contribute to the longevity of the prosthesis as well. This is a practical substitute for patients who are not prepared to undergo surgical procedures which would be required in implant supported prosthesis. By conforming to meticulous techniques, appropriate diagnosis and consistent recall maintenance, the successful management and preservation of the patient's prosthesis and the remaining dentition will result.

*Source; Peter T Pontsa RDT and Ljepa Katanic, Technical Product Attachment Specialist*

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## Introducing... Ljepa Katanic

Ljepa Katanic is a dedicated professional who first discovered her passion for the dental industry when she started her career in the dental laboratory upon graduation from George Brown College. After four years in the dental lab, she wanted to expand her knowledge base by challenging herself in the dental sales industry, starting off her journey with Vident Canada. Ljepa comes to Dent-Line of Canada Inc., a division of Central Dental Ltd. with an enthusiastic attitude and looks forward to the exciting challenges presented in her new position as Technical and Product Attachment Specialist. Amongst Ljepa's side interests, she also possesses a comprehensive knowledge of the real estate market, its trends and economic indicators.

Ljepa also enjoys practicing yoga and is a family oriented person as she loves summertime cook-outs on weekends with her family and friends. Ljepa brings an enthusiastic attitude to the dental industry and is committed to the dental markets for all of Canada.



## Upcoming Events: Central Dental Golf Day

Central Dental Ltd. is announcing its 5th Annual Spring Classic Golf Tournament which will take place on Friday, June 7th, 2013 with a 1:00 p.m. Tee-Off time. The location is The Brairs Golf Club on 127 Hedge Road, Sutton West, Ontario, L0E 1R0. The price per golfer is \$140.00

which includes 18 holes, Cart, Dinner, Prizes and More. Central Dental Ltd. warmly invites their new *Dent-Line of Canada Inc. customers* to this fun filled event. To register, please contact Jessica or Laurie Smith at 1-800-268-4442.

**C/D** dent-line of canada inc.  
a division of Central Dental Ltd.

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**The Dent-Liner®; Volume 17, Issue 2  
Publisher; Peter T. Pontsa RDT  
Editor; A. van Breemen, BA**

#### Subscription Rates:

Canada	1 Year	\$ 6.00
USA	1 Year	\$ 8.00
International	1 Year	\$16.00

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