

A Bulletin Dealing With Issues For Dental Health Professionals

Screw Retained Prosthesis

Screw connections are indicated when retrievability is a primary factor. They are used in non parallel abutment teeth for splinting bridges as well as super structures in combination with implants. Screw connected parts can also be made with other prefabricated attachments in combination to provide adequate retention and retrievability. Usually the Bredent Titanium screws can be utilized for lingual placement, away from the aesthetic zone. The placement can be pre-determined and access is accomplished through the tap & drill tool set. While it allows

implant placement to be made by facial emergence profiles, a one piece milled substructure would have a passive fit with little load on the screw. Verification is easy while the anatomy is not compromised by lingual screw placement. This gives you predictable retention that is retrievable unlike cemented restorations. Variation of implant angulation becomes less important and can be overcome without angled abutments. Infrastructures can be splinted or designed individually. Bredent manufactures two titanium machined screws with diameters of 1.4 mm and 1.6 mm with a screw head

length of 2.5 mm and a new extended 3.5 mm screw head as well. These two screws should cover most situations. The screw is tapped into place vertically or on an angle into the primary fabrication (e.g. crown, implant or cantilevered pontic). The screw head has a 8° morse taper which by virtue of its design pulls the secondary structure on to the primary fabrication. The morse taper ensures that there is no unscrewing of the titanium screw. The screw head can be reduced in order to follow the contour of the lingual anatomy

Continued on page 3

Removable Partial Denture Design

Designing and fabricating this type of prosthesis requires a health history, a clinical examination, x-rays, a dental surveyor, mounted diagnostic models and further consultations with the dental technologist who will fabricate the cast partial. The process of the diagnosis and decision making is made possible through the collective utilization of the health professionals' experience and co-operation of all disciplines involved. Subsequent to the analytical data that has been collected and the decision to provide this treatment modality, the process of a detailed design sequence must be followed.

- (1) Choice of abutments.
- (2) Location of rests on abutments.
- (3) Surveying the path of insertion.
- (4) Assigning the major connector.
- (5) Assigning the minor connectors.
- (6) Position of the clasp for

retentive purposes.

- (7) Placement of reciprocating arms.
 - (8) Placement of bracing components.
 - (9) Designing the denture base retention.
- In any given situation the X-rays, clinical assessment and diagnostic models provide the vast source of information required to choose the abutments. The dental health professional should decide which teeth can accept the supplementary load transferred through the rests and other elements. In order to select specific abutments the following features should be evaluated:

- (1) Crown root ratios.
 - (2) Number of roots.
 - (3) Morphology of roots.
 - (4) Inclination of teeth.
 - (5) Alveolar bone support.
 - (6) Mobility of teeth.
 - (7) Estimation of added stress.
- All of the qualities listed should be assessed so that excessive loading is avoided by making informed decisions

that will not exceed the loading capabilities of the abutments. The abutments that have been selected need to have rests. Preparation of the enamel should be avoided and health professionals should avoid placing a rest into an area of occlusal function. When surveying, the path of insertion is established by an interaction of the alignment of guide planes, the aesthetic consideration in the anterior cosmetic zone, suitable retentive areas and interferences to the proposed path of insertion. For more realistic purposes, it is advantageous to consider the path of insertion as also the path of dislocation.

The functioning of the partial denture is fundamentally affected by the path of dislodgement. Consider whether the existing guide planes, minor connectors and clasps purposely determine the path in which the denture

Continued on page 2

Special Interest Articles:

- Screw Retained Prosthesis
- Removable Partial Denture Design

Individual Highlights:

- Bredent's Standard Modelling Wax 2
- Renfert's Kolinsky Brushes 2
- Trade News 4
- Announcement 4

Removable Partial Denture Design cont'd



Gravity acts to moderate the successful retention of a maxillary denture and contributes to the entire retention in the mandibular denture.

Peter T. Pontsa, RDT

will be dislodged from its seated position when a random force is applied. A clinical situation where only the six anterior teeth remain in the maxilla may have the model surveyed to fabricate guide planes on the distal of both cuspids. Predictably on most cuspids, the lingual and the sections of the missing proximal walls are too short to effect guidance. Also the lingual incline of cuspids provides no vertical lingual contours to fabricate retention. When placing a partial denture including I bar clasps, located at the mesio-distal centre of the labial surface, finger pressure assures the proper seated position. Yet in function an arbitrarily applied dislodging force in the posterior may cause the prosthesis to fall. At the cuspids, the distal guide planes are entirely unsuccessful in controlling the path of dislodgement. An I bar positioned on the mesio-distal height of contour below the survey line will slip distally-occlusally out of position as the denture base moves downward. Therefore in order to accomplish successful retention and balance the lack of guided dislodgement, I bar clasps should be located in both an undercut below the survey line and a recess anterior to the mesio-distal

height of contour. Then the I bar clasps will be forced to flex when the removable partial denture is dislodged. Circumferential clasps avoids the dislodgement problem if they are located in the same area. However aesthetics will be compromised over using an I bar in this circumstance. Continuing with the design parameters, abutments have been selected, rests located and the insertion dislodgement path ascertained, major connectors are positioned. The major connectors are elements of a removable partial denture that joins the various parts located about the dental arch into a rigid unit. Connectors must be rigid in order to disperse the function load over multiple abutments and the soft tissue. The major connectors which can provide adequate strength are: (1) The anterior posterior palatal bar. (2) palatal plate. (3) Full cast palate. (4) Mandibular bar. (5) Lingual plate. (6) The seldom used mandibular labial bar. Minor connectors are rigid connecting links between the major connector and other units of the removable partial denture. The ability of the denture to withstand dislodging forces is called retention. The total amount of retention depends upon:

- (1) Adhesion. (2) Cohesion. (3) Interfacial surface tension. (4) Atmospheric pressure. (5) Gravity. (6) Frictional drag of the guide plates. (7) Indirect retention. (8) Mechanical retention. Adhesion, cohesion and interfacial surface tension are also attributed to the function of saliva interposed between two intimate surfaces (mucosa and denture base). Gravity acts to moderate the successful retention of a maxillary denture and contributes to the entire retention in the mandibular denture. Chrome Cobalt and Titanium metals are stronger than gold, are less bulky and reduce the gravitational effect on the entire retention of removable partial dentures. Frictional retention occurs from the close proximity of opposing guide planes and guide plates. The greater the area of surface contact of the parallel guiding surfaces the more efficient the retention. The effectiveness of mechanical retainers (clasps) relies on: (1) The flexibility of the clasp. (2) The approach angle of the clasp to the abutment. (3) The depth of the undercut utilized. Flexibility of the clasp varies: (1) Directly with the length. (2) Inversely with the thickness. (3) Inversely with the width.



This standard wax is perfect for crowns, bridges and inlays.

Featured Product : Bredent's Standard Modelling Wax

This standard modelling wax comes only in beige and was designed to stand alone for general modelling of crowns, bridges and inlays. The wax can be processed easily and has adequate features and good quality. The solidification point is at approximately 50 degrees and is packaged

in a 70 gram container. This wax was designed for affordable quality and does not provide some of the special advantages as seen with the other modelling waxes from Bredent. So for general waxing procedures this affordable quality wax is perfect for the technician who is price conscious.

Note: There are no samples available at this time.

For further information, contact Dent-line at 1-800-250-5111 or e-mail us at info@dent-line.com



Modern transparent design makes ceramic work a pleasure!

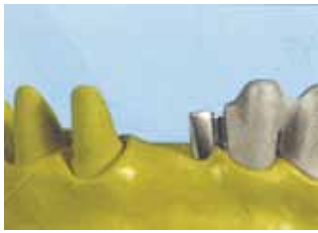
Featured Product : Renfert's Kolinsky Brushes

The red sable Kolinsky brush has a durable plastic transparent design. The fine natural hair tips provide excellent liquid retention and flexibility. The handle is well balanced for excellent control

and also has a slanted tip that can be used for picking up dry porcelain. The brushes comes in a package of two and the sizes are 0,1,2,4,6,8; an assortment set of six is also available.

For further information, contact Dent-line at 1-800-250-5111 or e-mail us at info@dent-line.com

Screw Retained Prosthesis cont'd ... The Fabrication



The cantilevered abutment of the bridge features the same path of insertion as the abutment teeth.



Wax-up the second bridge element, cast and finish.



Prepare a small groove at the point where the screw is to be placed.



Drill through the secondary element approx. 1.5 mm deep into the substructure using the Diatit-Multi-Drill.



Remove the secondary element and drill into the substructure up to the stop using the Diatit-Multidrill with stop.



Assemble the substructure and superstructure up to the stop using the tungsten carbide facing cutter.



Bredent's Titanium Screws can be used for lingual placement, away from the aesthetic zone.



Cut the thread into the substructure. First use the first tap and then the last tap.



Assemble the substructure and superstructure and turn into the screw



The screw head with the superstructure is ground flush and then polished.

The tool kit consists of four drills, two taps, holder, screwdriver and two screws. As a result of the diatit coating on the three edged drill, the multi drill achieves a diamond pyramid hardness of up to 3700 Vickers Hardness. In order to connect passive components together, the centre drill is used first to drill a dimple where the screw is to be placed. The hole is drilled with the multi drill through the primary and secondary structures. Next, separate both structures and proceed to drill in the primary part with the stop drill. This drill has a depth gauge which allows you only to drill the proper length for the thread part of the screw. Next the conical recess for the tapered

screw head is created with the facing cutter when the primary and secondary parts are assembled. A thread is cut by hand using the 1.4 or 1.6 mm tap and special tap holder, milling & drilling oil is applied. The second tap has a more refined pitch to the thread and is used to retap the hole for a second time. This will ensure that the threads will match the ones on the machined screw. Once secured with the screwdriver the titanium screw will hold securely with up to a shear strength of 1550 Newtons. In conclusion, The Bredent Diatit-Multidrill tool kit can be used for fabricating custom screwed connectors. The 8° morse taper provides a self locking effect, therefore making it

difficult for screws to become loose. The lingual access is easy and is out of the aesthetic zone. The anatomy is also not compromised. A primary substructure can be used on extreme implant angulations and root emergence. All ceramic restorations can also be fixed with predictable retention that is also retrievable.

Source: Peter T. Pontsa, RDT

For further information, contact Dent-line at 1-800-250-5111 or e-mail us at info@dent-line.com



Using the Bredent Tap & Drill Set, one can accomplish fast, effective, inexpensive and tension-free screw connections.

dent-line of canada

1170, 4th Line,
Adjala, R.R. # 1
Loretto, Ontario,
L0G 1L0

PHONE:
1-800-250-5111
or
519-942-9315

FAX:
519-942-8150

EMAIL:
info@dent-line.com

We're on the Web!
See us at:
www.dent-line.com

About Our Organization...

The Dent-Liner; Vol. 8 No. 4
Publisher; Peter T. Pontsa, RDT
Editor; A. van Breemen, BA

Subscription Rates:
Canada 1 Year \$ 5.00
USA 1 Year \$ 7.00
International 1 Year \$15.00

Continuing education
credits apply for a review of
this newsletter. For details
contact the Quality Assurance
committee in your jurisdiction.

Receipt of the dent-liner implies
consent under the P.I.E.D.A. unless
you advise dent-line of canada
either orally or in writing that you
wish not to receive this newsletter.

Removable Partial Denture Design Cont'd

(4) According to the cross sectional form and taper. (5) With the type of alloy used. Since retentive ratios decrease as flexibility increases, the health professional may decide to increase rigidity of a clasp by using cast alloy or increase flexibility with a gold alloy wrought wire clasp that is soldered onto the cast partial frame work. Treatment may employ flexibility, as a way to provide a measure of stress relief to an abutment whose alveolar support is less than optimal, or is already tolerating a heavy functional load. The I bar is clean, efficient and aesthetic. It has less tooth contact area, is not often linked with caries and will cause very little distortion of the coronal contours. While the I bar is versatile, it is not indicated for use when (1) An alveolar exostosis

blocks the approach. (2) The vestibule is shallow. (3) Frenal attachments are high. (4) The lip line exposes the maxillary mucosa in function. (5) A serverely tipped abutment hampers the approach. So long as clasps collectively add satisfactory retention to maintain the dentures' position during function, it appears biologically advantageous to use a minimal amount of under cut possible for individual retainers. What ever the clasp design or material used, the retainer must (1) be capable of flexing; (2) be located so that it will activate when possible loading is applied; (3) be totally passive when seated; (4) and be reciprocated whenever possible. The needs of the patient are revealed in the diagnostic data which determines

removable partial denture treatment and design. Predictable treatment plans depend on the dental health professional's ability to create a healthy oral environment into which the denture is placed and to also design and construct the denture to the standards of practice through a RDT supervised dental laboratory. Finally, preparing the patient to maintain a regular maintenance program will ensure that the prosthesis will provide good service over a long period of time.

Source: Peter T. Pontsa, RDT

For further information, contact Dent-line at 1-800-250-5111 or e-mail us at info@dent-line.com

Trade News:

Dent-Line and Renfert USA would like to announce their course; **Anatomical Waxing of a Full Crown: Short cuts and Hints**. This course will be held at George Brown Community College in Room B-316 on October 28th of 2004 from 6:30 pm to 9:30 pm. The course faciliator will be Mr. Micheal Kessenich, C.D.T. The tuition is \$150.00 CAD. **Please call dent-line at 1-800-250-5111 to register.**

Bredent attachment courses are being held in Miami, Florida at the Bredent USA laboratory facilities for the current 2004 year.

The Implant Bar Course consists of designing functional implant bars using the Bredent attachment systems. The topics covered are parallelism, milling and constructing low profile implant bars. Course dates are September 23rd & 24th, October 14th & 15th.

The Vario Kugel Snap-SG,OC and Vario Soft-3 Introductory Course.

Learn to design and create restorations with Bredent's most popular attachments, including the basic principles of the VS-3 vertical bar and SG/OC ball attachments. Course dates are November 11th & 12th.

The Overcasting Course Learn to fabricate and fit an implant overdenture superstructure using conventional lab equipment. Practice two overcasting techniques, the lift off version with modelling resin and the refractory method. Open to implant, C&B, and partial denture technicians. Course dates are October 28th & 29th.

For further information, please contact Charlie Rivas at 305-233-3312 Ext.: 214

Upcoming Events:

The 4th World Denturism Symposium will be held in Montreal from October the 11th to the 17th at the Palais des Congres de Montreal. Please come and visit our booth to see the latest in dental products. **For more information, please call 514-252-0270**

Den-Technica du Quebec is the only dental technical trade show to be held in the province of Quebec. It will be held at the Sandman Hotel in Longueuil on November the 4th & 5th of 2004. Please come and visit our booth for the latest developments in dental materials. **For more information please contact Mr. Jean Compagna at 514-728-5352**

Special Announcement:

Dent-Line is pleased to announce that our inside sales representative Mr. Hatem Raslan will be the new sales representative for the Montreal area starting November 2004.