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Editor: Edwin A. McGlumphy, DDS, MS, Associate Professor, Department of Restorative & Prosthetic Dentistry, College of Dentistry, The Ohio State University

Current Overview

Experimental studies
Screw vs. cement retained restorations

Assenza B, Scarano A, Leghissa G, Carusi G, Thams U, Roman FS and Piattelli A. Screw- vs cement-implant-retained restorations: an experimental study in the Beagle. Part 1. Screw and abutment loosening. J Oral Implantol 31: 242-6, 2005.

This study was to clinically evaluate the incidents of screw loosening in screwed and cemented abutments. 6 adult male beagles were used with their first molars and second pre-molars extracted. Each dog received 10 implants, 5 in each half of the mandible. 3 months post-extraction, implants were placed by submerged approach under general anesthesia with the top of the implant (micro gap) located clinically at the alveolar crest. Daily rinsing with chlorhexidine mouthwash and soft diet during the first 2 weeks post-surgery.

Second stage surgery for abutment connection was done 3 months post-implantation. 30 abutments were screwed in by applying a total torque of 13 Newton centimeters and the other 30 cemented with Panavia 21 with a load of 5 kg maintained for 10 minutes. This was followed by cementation of an FPD of 6 units. After 1 year all bridges were removed and abutments were examined for mobility by alternately pressing the facial and lingual surfaces using non-working ends of 2 instrument handles.

In This Issue

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Results showed 8 loosened screw abutments and no loosening in the cemented abutments. Screw abutments are often subjected to non-axial loads that determine screw and abutment loosening, especially during the first year of functional loading. Loosening of abutments can cause fracture, peri-implant tissue inflammation and loss of crestal bone due to bacterial colonization.

Screw tightening is necessary especially in the first year. Previous studies also showed cement in abutment filled interface between the abutment and implants, preventing relative movements and colonization of fluid and bacteria.

Bartolomeo Assenza, Dental School, University of Chieti-Pescara, Chieti, Italy.

Implants
Acrylic resin
Immediate loading

Tepret F, Sertgoz A and Basa S. Immediately loaded anterior single-tooth implants: two cases. Implant Dent 14: 242-7, 2005.

Loading implants early and immediately have gained popularity in recent years. This article presents 2 case reports where 2 implants were immediately loaded. The advantages of immediate loading are reduced treatment time, preservation of residual bone, and optimal aesthetics. Though earlier thought to cause implant failure, it has been shown that micro-motion during healing causes a fibrous union. Both cases presented are similar, involving a tooth that was gently removed from the socket.

The first case was done without any incisions or flaps. A flap was raised in the second case. The Dentsply Frialit-2 implant was placed and primary stability achieved. An oval cross-section temporary abutment was placed for better soft tissue healing. After modifications, if necessary, an impression was made of the abutment.

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Contributing Writer Kumar Shah, DDS

A heat-cured acrylic resin provisional was fabricated and cemented within 24 hours. Both centric and non-centric occlusal contacts were relieved. They were followed up at 1, 3, and 6 months after which a final abutment and restoration was fabricated and placed.

The author claims that the shock absorbing capability of the acrylic resin provisional aided in preventing direct motion to the implant. Immediate loading of implants is promising and seems to be equally successful if the case selection is done well and a few basic requirements are met.

Dr. Fulya Tepret, Department of Prosthodontics, Marmara University, School of Dentistry, Istanbul, Turkey.

Semsch R and Muche R. Implant-supported bar-latch overdenture for the severely atrophied, edentulous jaw: a case report. Quintessence Int 36: 565-76, 2005.

Implants
Bar-latch overdenture
Atrophic edentulous maxilla
Sinus lift procedure

This is a case report involving a patient with a severely atrophic edentulous maxilla. A detailed history and treatment plan was discussed. Though initially planned for 8 implants with a bilateral sinus lift procedure, only 5 implants were placed due to inability to perform the sinus lift procedure. The patient had a history of trauma and bone fixation.

3.8 mm diameter implants of 11–13 mm in length were used. The treatment plan for the partially dentate mandibular arch was implant restorations in the bilaterally edentulous sites. The patient was left without a prosthesis for 2 weeks after which the maxillary denture was realigned with a soft resilient material. The maxillary implants were uncovered in 6 months and the prosthodontic phase was started.

The authors then elaborated into the clinical and lab procedures where the occlusal vertical dimension, phonetics and aesthetics was evaluated. They decided that there was inadequate upper lip support and a labial flange was necessary for proper lip support.

This was evaluated in the maxillary provisional prosthesis. A milled bar was used to retain this provisional prosthesis. Once the proper esthetic was established, the definitive process was then ready to be made. This involved the use of special attachments (latch leaves) incorporated into the primary bar. Secondary components were then fabricated using the galvanic forming technique. A tertiary structure was then made with chrome cobalt alloy and luted to the secondary components. Individual ceramic crowns were then fabricated and luted to the secondary framework.

The gingival portion of the prosthesis was then added using acrylic resin. The final prosthesis thus involved a removable prosthesis that was held in place with a secondary structure and latches. This engaged a primary bar that was attached securely to the 5 implants. The authors claimed that they have restored approximately 115 bar-latch overdentures cases. Until now, their success rate has been 100%.

R. Semsch, Dental Concept, Freiburg, 114 Habsburgerstrasse, 79104 Freiburg, Germany.

Implants Guided bone regeneration

De Boever AL and De Boever JA. Guided bone regeneration around non-submerged implants in narrow alveolar ridges: a prospective long-term clinical study. Clin Oral Implants Res 16: 549-56, 2005.

This is a prospective clinical study that evaluated the success of guided bone regeneration done at the time of implant placement. This involved the use of Bio-Oss and xenograft with a Gore-tex non-resolvable membrane. 16 ITI Straumann implants in both arches were placed in 13 patients, 4 males and 9 females. There was buccal dehiscence ranging from 3 mm up to 9 mm at the correct implant depth.

Bio-Oss was used to cover the implant thread and a Gore-tex membrane placed over it. The soft tissue was sutured to leave the implant exposed intraorally (1-stage procedure). The head of the implant perforated through the membrane to provide stability of the membrane. No additional screws were used. There was no provisional prosthesis over these implants. Post-op care included twice a day rinse of 0.2% chlorhexidine, regular dental hygiene and NSAIDs. No antibiotics were prescribed.

The membrane was removed when exposed through the soft tissue, all at 16–24 weeks. Permanent single crowns were placed 3–6 months after membrane removal. Regular 6 monthly recalls included periodontal evaluations, especially around the implant sites.

Results showed 1 implant failure at 1 month. The other 15 implants had osseointegrated. The one that failed had an 8 mm of dehiscence that had been grafted. The implant was 10 mm in length. 13 of 15 successful implants had 100% coverage with highly vascularized soft tissue. The other 2 implants had 63% and 87% coverage. Only 1 implant had crestal bone loss at follow-up. The follow-up period varied from 12 months to 114 months. No peri-implantitis was noted. There was bleeding on probing of 2 implants with plaque accummulation around these 2 implants. Sulcus depth was generally less than 3 mm, except for one 6 mm depth.

They attempted to compare this study to several other studies with similar success. The authors claimed that large bony dehiscence can be successfully treated with a 1-stage implant placement and a xenograft with non-resolvable membrane.

Annemarie L. De Boever, Department of Fixed Prosthodontics and Periodontology, Faculty of Medicine and Health Sciences Dental School, Gent University, Gent, Belgium, e-mail: annemariedeboever@hotmail.com

Michalakis KX, Kalpidis CD, Kang K and Hirayama H. A simple impression technique for dental implants placed in close proximity or adverse angulations. J Prosthet Dent 94: 293-5, 2005.

Implants
Impression technique
Close adjacent implants

A technique for making an implant impression is described here with 2 adjacent implants that are too close to each other to allow both impression copings to be placed at the same time. This is especially so when their angulations will not allow it to.

2 open tray impression copings were used, the first one placed in the implant and then cut with a Carborundum disk to shorten it enough to allow seating of the second impression coping. It is vertically cut short. Retentive serrations are then cut into the first modified coping. A short screw is used to secure the first coping and a standard long open tray screw is used to secure the second impression coping. A low shrinking auto-polymerizing polymethylmethacrylate resin (GC pattern resin) is then used to lute the 2 copings together after verification of proper seating with a radiograph.

After curing the first short screw (modified coping) is removed; a regular polyether open tray impression is then made using the second screw alone. First, when the impression is removed both the original coping and the modified coping (which were luted together) will remain in the impression material as 1 unit. The analogs are then placed and the final restorations fabricated in the conventional way.

Dr. Konstantinos X. Michalakis, 3, Greg. Palama St., Thessalonika 546 22, Greece, fax: 011-30-2310-272-228.

Goene R, Bianchesi C, Huerzeler M, Del Lupo R, Testori T, Davarpanah M and Jalbout Z. Performance of short implants in partial restorations: 3-year follow-up of Osseotite implants. Implant Dent 14: 274-80, 2005.

Implants
Short-stemmed FPDs

This clinical study done in a private practice setting looked at a total of 188 patients having 311 short Osseotite implants in various partially dentate situations. Restorations included single crowns, short spanned fixed partial dentures (FPDs) (less than 4 units) and long spanned FPDs (more than 4 units). 7 mm (5.5%) and 8.5 mm (94.5%) implants were used in the areas of anatomic limitations both in the maxilla and mandible.

Bone density was noted according to Trisi's classification. 1) high density; 2) normal moderate density; and 3) soft low density. The implants were loaded on an average of 8.5 months and the average follow-up time was 39.1 months. 56% was in normal bone, while about 10% was in class 1 and 20% in class 2 bone (only 239 out of 311 implants had a bone classification done). Almost 80% of the prostheses were short spanned FPDs. 13.5% in longer spanned FPDs and the remaining 6.8% were single tooth restorations. About half of the 311 implants were 3.75 mm in diameter.

A total of 13 implants had failed in the 3-year follow up, 3 in the maxillary, 10 in the mandible. The overall success rate was 95.8% at 3 years. 10 out of these 13 implants had failed prior to prosthetic loading. The remaining 3 implants failed within 3 months after second stage surgery. 9 of the 13 failures were in non-smokers, 3 in smokers (10 cigarettes a day) and 1 in a heavy smoker (30 cigarettes a day).

In this study, the Albrektsson's criteria for success was used and they did not include prosthetic complications. The only prosthetic complication they had was screw loosening which did not affect the implant survival. 5 of the 13 implants were in soft bone, 3 in normal, and 2 in dense. The other 3 implants did not have a bone classification.

The authors also tried to compare their study with some other previously done studies. They concluded that the textured Osseotite surface was comparable to a long machined surface implant in terms of their success rates and thus such a short implant length may be a clinically viable treatment option where anatomic limitations may otherwise involve more invasive surgical procedures.

Dr. Ronnie Goene, Department of Oral & Maxillofacial Surgery, ACTA/VU Medical Center, Amsterdam, Netherlands.

Implants
Special care patients
Complications
Loaded implant survival

Oczakir C, Balmer S and Mericske-Stern R. Implant-prosthodontic treatment for special care patients: a case series study. Int J Prosthodont 18: 383-9, 2005.

This is a 12-year follow-up study on a total of 103 implants in 25 patients with special care. These included cleft lip and palate (8), Down's syndrome (3), Sjogren's syndrome and scleroderma (2), ectodermal dysplasia (4), developmental retardation (2), chronic leukemia (2), lichen planus (1), cerebral palsy (1), deaf-muteness (1), amyotrophic lateral sclerosis (1).

The average follow up period was 5.8 years (range from 2 years to 12 years). The prosthesis type included mainly an overdenture/removable partial denture (RPD) (23 units) post-op. 8 were fixed partial dentures (FPDs)/single crowns and 3 were fixed complete prostheses. All patients went through a re-evaluation for this study where the data was collected.

The survival of all loaded implants was 100%. There was 1 patient with amyotrophic lateral sclerosis who had 2 implants that failed and did not wish to go through implant surgery again (thus, the survival rate of the healing phase was 97.2%).

Another patient with a cleft lip/palate had implant mobility within 3 weeks. The implant was removed and a wider one placed at that time. That implant was successfully loaded after a healing period. All but 1 of the prostheses that was originally placed was still functional. One short spanned FPD had to be remade. Besides some normal wear and screw loosening complications, the authors claimed 100% prosthesis survival rate.

The main known implant complications the authors faced was a lack of good oral hygiene. This, in turn, led to 2 problems; some remaining teeth had to be extracted after treatment was completed.

The author had some complications with a substructure base for an overdenture. The incidences in which these seemed to happen were similar to that of any other adult population study. The authors concluded that implant prosthodontic treatment may not only be done, but may also be recommended in patients with special medical conditions to facilitate fabrication of an optimum functional prosthesis without the worry of a higher risk of failure if planned properly.

Dr. Ceyda Öczakir, Department of Prosthodontics, University of Bern, Switzerland.

Jivraj S, Corrado P and Chee W. An interdisciplinary approach to treatment planning in implant dentistry. J Calif Dent Assoc 33: 293-300, 2005.

Implants
Treatment planning

An interdisciplinary approach integrates the knowledge, skills and experience of all the disciplines of dentistry into a comprehensive treatment plan. A well executed implant-supported restoration can offer satisfaction to both the patient and dentist. A highly organized method of communication is needed between team members of the interdisciplinary therapy. Meticulous diagnosis and treatment planning is essential if a static result is to be obtained.

The authors recommend formulating a joint treatment letter for the patient on behalf of each team member. This should include the proposed treatment, the inherent risks involved, treatment alternatives, informed consent and the financial responsibilities of the patient. The team leader should be the restorative dentist, since he or she is responsible for the definitive appearance of the prosthesis. Each phase of treatment must be well planned and executed to achieve optimal aesthetics. Preoperative evaluation with diagnostic casts and radiographs are

critical. Space requirements for a prosthesis have to be carefully evaluated.

The first case report is of a 67 year-old woman who wanted to replace her current removable partial denture with a fixed restoration. Since she had a free end saddle that was edentulous, tooth movement was difficult without adequate anchorage. By utilizing an interdisciplinary approach, endosseous implants were used to provide anchorage. This involved communication between the surgeon, orthodontist and the prosthodontist. Implants were placed at the start of treatment, bearing in mind the final objective of tooth movement. They were planned in such a way that these implants could be restored post-orthodontic treatment. The implants were then used as anchorage for orthodontic tooth movement. The implants were then restored once the orthodontic movement was complete.

The second case report is of a 38 year-old woman with congenitally missing lateral incisors. Careful evaluation with diagnostic radiographs showed an inadequate space between the roots of the central incisors and the canines. Implant placement would have been difficult if not impossible in these sites. Computer aided tomography also showed inadequate buccal lingual width for implant placement.

An interdisciplinary treatment plan was fabricated where the orthodontist was involved to chart the roots so as to create a space for the larger incisors for implantation. After orthodontic therapy, the surgeon had to graft the sites at number 7 and 10 with a bone graft. Only after the graft was healed were 2 implants placed at the 7 and 10 spots, and the anterior segment was restored with definitive metal ceramic implant supported restorations and bonded porcelain veneers on 8 and 9.

This article showed the importance of good communication among the disciplines of dentistry, and an interdisciplinary approach for the management of patients with complex treatment requirements may result in long-term predictable and aesthetic outcomes.

Dr. Sajid Jivraj, Section of Fixed Prosthodontics and Operative Dentistry at the University of Southern California, School of Dentistry, Room 4375, University Park, Los Angeles, CA 90089-0641.

Implants Wide diameter vs. regular diameter

Huang HL, Huang JS, Ko CC, Hsu JT, Chang CH and Chen MY. Effects of splinted prosthesis supported a wide implant or two implants: a three-dimensional finite element analysis. Clin Oral Impl Res 16: 466-72, 2005.

In this study authors evaluated the performance of wide diameter implants and 2-molar regular diameter implants to replace 1 molar. 2 different types of analysis were used—a finite element analysis, and this

was then controlled with an actual lab experiment. A second premolar and first molar models were used. The 2 units were either separated or left as individual units. Also, while keeping the premolar unit (3.75 mm diameter) and implants the same, the molar implant unit was changed to either a regular implant (same as the premolar implant), a wide diameter implant (5.0 mm), or 2 regular implants. All implant lengths were kept constant to 12 mm. Thus, a total of 6 different designs were evaluated.

A load of 100 Newtons at 45º angle to the long axis was used. An actual model was created using acrylic resin and subjected to similar loading. String gauges were used to evaluate the difference. The result showed that, when using the same diameter implants, there was no difference between splinting and not splinting the 2 crowns. As expected, not splinting did not affect the second premolar implant load.

There was no difference between the 2 regular implants or 1 wide diameter implant for both splinted and non-splinted situations. But, when using both regular implants for the premolar and molar unit, there seemed to be an increase of 29 to 37% peak stress in the crestal bone when compared to wide implant of 2 molar implants at the molar positions.

Bone stresses were reduced by 25% at the second premolar region when used in conjunction with a wide diameter molar implant, both regular molar implants.

The authors concluded that there was no advantage between a wide diameter implant and the 2 molar regular diameter implants. Their decision should be based upon anatomic limitations and not a biomechanical one. Also, there was a benefit of splinting crowns only when the 2 implants have a different load-bearing capability (i.e., different diameter), in which case the load on the smaller implant is distributed slightly to the other implant.

Chih-Han Chang, Institute of Biomedical Engineering, National Cheng Kung University, No. 1 Ta-Hsueh Road, Tainan 701, Taiwan, fax: 011-88-66-2343270.

Materials
Adhesives

Peregrina A, Land MF, Wandling C and Johnston WM. The effect of different adhesives on vinyl polysiloxane bond strength to two tray materials. J Pros Dent 94: 209-13, 2005.

There has not been a common agreement about the use of adhesives supplied by the manufacturer. The purpose of this article was to compare 5 different adhesives, 3 of which were supplied by the manufacturer along with 3 impression materials. The 5 adhesives were all used on 2 types of tray material and autopolymerizing resin and a light cured resin (triad). The 3 impression materials tested were Affins, Aquasil and Take I.

Besides the adhesives supplied by the manufacturer, a paint-on universal PVS adhesive by GC America and a spray on Sili Spray was used.

For each tray material, a total of 90 flat 15×15×20 mm specimens were fabricated and the tops polished with a 320 grit silicone carbide paper. Eye hooks were incorporated into these as well as PVC tubing to allow tensile bond testing with an instrument testing machine. A thin coat of adhesive was painted and allowed to dry for 10 minutes. Impression material was placed in the PVC tubing over the painted tray materials and allowed to set prior to testing.

Results showed that the paint-on adhesive performed significantly better than the sprayed-on adhesive. The Universal GC adhesive had a significantly better bond compared to all groups except Take I. There was no difference between Universal GC adhesive and Take I in terms of strength values.

An interesting point to note is that specimens with spray on adhesive and Aquasil adhesive demonstrated failure at the adhesive impression interface whereas those with Universal GC, Take I with its own adhesive and Affins with its own adhesive had both adhesive impression material and adhesive tray failure. The authors concluded that the use of Universal GC paint on adhesive consistently resulted in higher retentive values. Only Take I material with its own adhesive had equally high values.

Dr. A. Peregrina, The Ohio State University, College of Dentistry, 305 West 12th Ave., Columbus, OH 43210, fax: 614-292-9422.

Restorations CAD/CAM ceramic inlays

Hannig C, Westphal C, Becker K and Attin T. Fracture resistance of endodontically treated maxillary premolars restored with CAD/CAM ceramic inlays. J Prosthet Dent 94: 342-9, 2005.

Endodontic treatment has been shown, at times, to result in a weaker remaining tooth structure. Some authors have advocated the use of a bonded restoration to help reinforce the tooth and prevent fracture. Both direct and indirect bonded restorations have been implicated. However, there has not been any conclusive data on this theory.

The aim of this lab study was to evaluate the fracture strength of endodontically treated teeth and those restored with a CAD/CAM inlay that was bonded. A total of 3 groups with 15 premolars were evaluated. One group was endodontically treated and restored with a CEREC MOD inlay. The other group was only treated with a CEREC MOD inlay. The third group was left intact as a control.

The inlay preparations were standardized in their dimensions so that they were similar to clinical practice. The endodontic treatment was done with rotary instruments and heated gutta percha. The ceramic inlays were bonded with a dentin adhesive system according to the manufacturer's

instructions. The teeth were then subjected to the fracture toughness testing by a universal testing machine.

The specimens were tilted to approximately 35º such that the palatal cusps were perpendicular to the test load. The load to fracture was recorded. The fractured specimens were visually inspected and categorized into 3 fracture types: 1) above the cemento-enamel junction (CEJ); 2) below the CEJ (pulp exposed or root canal filling exposed); and 3) fracture towards the central part of the tooth. Their results showed that there was no significant difference between the 3 groups in terms of load to failure.

When closely analyzed, the endodontically treated group showed more type 2 and type 3 fractures (severe fractures) compared to the control group. They concluded that restoration of an endodontically treated tooth with a bonded ceramic inlay did not reestablish their fracture resistance to their original level.

Dr. Christian Hannig, Department of Operative Dentistry, Preventive Dentistry and Periodontology, University of Gottingen, Robert-Koch-Str. 40, 37075 Gottingen, Germany, fax: 011-49-551-39-2037.

Restorations Indirect vs. direct

Christensen GJ. What has happened to conservative tooth restorations? J Am Dent Assoc 136: 1435-7, 2005.

This is an opinion paper in which the author examines the significant increase in recent years of placing full coverage crowns instead of using less aggressive conservative intracoronal tooth restorations. He discusses some of the reasons behind this trend.

First, there are third party payment implications; third party payers are more likely to pay for a full coverage crown than an indirect intracoronal restoration. Payment for a less aggressive restoration like an inlay or onlay may be denied or the company will pay for a lower cost amalgam rather than a crown fee. The author proposes that organized dentistry educate third party payers about the advantages of an indirect intracoronal restoration.

The second reason for the increased use of full coverage crowns is their perceived simplicity. The author states that an indirect inlay or onlay procedure is as successful and easy to perform as the full crown procedures; however, this is not generally accepted among the general dental profession.

Another reason he states for the popularity of full crowns is the laboratory's emphasis on the full crown procedures. Labs tend to advertise more crowns than other more conservative tooth restorations.

The last reason is that fees for full crowns are proportionately lower that for indirect restorations. In fact, indirect restorations may cost the patient as much as 6 times the cost of direct restoration. The author suggests that dentists analyze their fee schedules to match the time taken and difficulty of the procedure.

The author then states his rationale for conservative restorations. Preservation of tooth structure is important; it is common knowledge that indirect restorations preserve more tooth structure than a full coverage crown, and he suggests that indirect restorations be placed and replaced when needed. The tooth may require several indirect restorations replaced before a full coverage crown is finally placed. It is also worth noting that conservative dentistry has become easier. With new developments for caries detection and air abrasion, digital radiography and bonding procedures, conservative dentistry is becoming a lot easier.

By increasing fees for direct restorations to match the time taken to perform such a procedure, conservative dentistry would be more acceptable to dentists. In the author's opinion, conservative restorations can demonstrate good clinical service and longevity, and patients can be educated to more readily accept such restorations if they are well informed about its advantages.

Gordon Christensen, Clinical Research Associates, 3707 N. Canyon Road, Suite 3D, Provo, UT 84604.

Restorations
Partial denture removal
Ball anchor repair

Zhang H and Grasso JE. A technique for repairing a removable partial denture attachment anchor. J Prosthet Dent 94: 299-300, 2005.

Interocclusal clearance is frequently overlooked when using an attachment for retention of a removable partial denture. Failure to recognize this critical step may lead to frequent complications like fracture of acrylic resin and the bonding of resin teeth.

When the attachments are placed over implants, sometimes the different height abutment may sometimes be changed to solve the problem. However, if the ball attachment is placed over an endodontically treated tooth, removal of such an attachment may have the potential risk of root fracture. One case was presented in this article where a woman had 2 ball attachments (1 on natural teeth and 1 in the implant). After numerous denture repair of acrylic over the same attachment, the authors decided to modify and repair the attachment using the Rhein (repair ball anchor).

The first step was to recontour the ball attachment intraorally to a cylinder approximately 2.5 mm in height and 1 mm in diameter. The dome portion was also moved apically by grinding on the metal. The interocclusal space was then reevaluated to ensure sufficient clearance

for the new attachment and resin. The new ring repair ball anchor was then cemented onto the prepared cylinder using an autopolymerizing resin cement.

After removing the excess cement, the nylon matrix was attached to the partial denture framework intraorally in the conventional way. The denture was then repaired and the occlusion adjusted.

H. Zhang, Department of Restorative Dentistry, University of Washington, Seattle, WA.

Restorations
Patient age
Porcelain laminate veneers

Atsu SS, Aka PS, Kucukesmen HC, Kilicarslan MA and Atakan C. Age-related changes in tooth enamel as measured by electron microscopy: implications for porcelain laminate veneers. J Pros Dent 94: 336-41, 2005.

The purpose of this study was to measure enamel thickness using scanning electron microscopy (SEM) and was co-related to variation in the patient's age. The authors collected 40 maxillary central incisors that had no caries or restorations and were extracted due to periodontal reasons. Those with non-functional wear, erosion, anomalies and fractures were eliminated. They were sectioned longitudinally after fixation and evaluated under SEM. Measurements were made at the following sites: 1) 1, 3, 5 mm above the cemento-enamel junction (CEJ) buccally; 2) palatal thickness 5 mm above the CEJ; 3) at incisal edge facial and palatal thickness; 4) maximum facial palatal width at incisal edge (MFP); 5) physiology secondary dentin height (PSD); 6) facial cervical enamel pulp distance; and 7) incisal edge enamel pulp distance (IEP).

The results were presented in a table that reflected a statistically significant relationship between all the measured thicknesses and chronological age. The authors found enamel thickness to decrease at 1, 3 and 5 mm above the CEJ starting at the age of 50. The MFP, PSD and IEP all increased with age. For facial thickness at 1, 3 and 5 mm above the CEJ, the mean values were 0.31, 0.54 and 0.75, respectively. It was thus stated that a 0.5 mm reduction for a porcelain laminate veneer would result in the dentin being exposed on the cervical part.

This may imply poorer bonding success and potential micro leakage as bonding is considered strongest in enamel. They concluded that the operator has to take into account the patient's age when preparing a tooth for a porcelain laminate veneer.

Dr. Saadet Saglam Atsu, 444, Sokak 21/18 Orkide Ap, Cukurambar, Balgat, Ankara, Turkey, fax: 0090-0318-224-69-07.

Restorations
Premolar
All ceramic partial coverage

Stappert CF, Guess PC, Gerds T and Strub JR. All-ceramic partial coverage premolar restorations. Cavity preparation design, reliability and fracture resistance after fatigue. Am J Dent 18: 275-80, 2005.

This is an in-vitro study to investigate the effects of different cavity preparation designs on fracture resistance of posterior composite resins on natural premolars. A total of 5 groups of 16 freshly extracted human maxillary premolars were used. Filled, carious, and fractured teeth were eliminated prior to testing.

Teeth were stored in 0.1% thymol solution at room temperature to prevent dessication. Teeth were prepared with diamond burrs corresponding to clinical guidelines as follows: conventional for MOD inlays to modify posterior composite resins (palatal; palatal and buccal) and complete veneer. One group was left intact as the control. Double mixing technique impressions with polyvinyl siloxane material was used with a lithium dye silicate-like material for all restorations. The restorations were luted with Valiolink II (dual-polymerizing resin composite) according to the manufacturer's instructions. Artificial PDL (Anti-Rutsch-lack) was applied to the roots 2 mm short of the cemento-enamel junction (CEJ) prior to being imbedded in a self-polymerizing resin.

The specimens were subjected to 1.2 million mastication cycles (F=49 Newtons) and 5500 thermal cycles at 5º celsius and 55º celsius in a mastication simulator. Specimens that did not fracture were loaded until fracture using a universal testing machine. They were subsequently examined for loss or splitting of dentin enamel and/or all ceramic.

Results showed all specimens withstood masticatory simulation. The fracture strength values of the control and those prepared for MOD inlays were complete veneers with significantly higher strength than those prepared for posterior composite resins. The large amount of tooth structure loss during posterior composite resin preparations were probably responsible for significantly lower fracture strength. The large surface created during full veneer preparations evenly distributed the load and stressors as well as provided for a larger bonding surface for the restoration. This probably explained the high fracture strength.

The authors attempted to compare this study with other studies and also suggested that an in-vitro study be done to further control the findings of this study.

C. F. Stappert, Department of Prosthodontics, School of Dentistry, Albert-Ludwigs-University, Hugstetter Str. 55, 79106 Freiburg, Germany, e-mail: stappert@zmk2.ukl.uni-freiburg.de

Ganddini MR, Tallents RH, Ercoli C and Ganddini R. Technique for fabricating a cement-retained single-unit implant-supported provisional restoration in the esthetic zone. J Pros Dent 94: 296-8, 2005.

Restorations
Soft tissue contour

Developing soft tissue aesthetics can be done during the healing stage with a well-formed provisional restoration. The cylindrical healing abutment does not provide the same profile as the tooth. Many different methods have been proposed in the literature. This article describes 1 proposed method of fabricating a cement retained single-tooth provisional restoration.

The authors claim that it is simple, cost-effective and non-surgical. However, this can only be on implant systems where a carrier unit can act as an impression coping and temporary abutment. A polyvinylsiloxane (PVS) impression is made using the carrier device. After the cast is fabricated with the analog in place, the carrier device is prepared like a crown prep for a cement retained provisional restoration. A pre-fabricated polycarboxylate crown is relined and the margins sealed with the abutments removed from the cast. Both the abutments and the crown are then placed in the implant intraorally, and after 6 weeks of maturation the contours are re-evaluated. The final restoration is then made on the provisional or further modified if necessary.

According to the authors, the advantages of this procedure include: 1) improved soft tissue contour; 2) no need for an additional surgical procedure to shape the soft tissue; and 3) better development of an interdental papilla.

Dr. Carlo Ercoli, Division of Prosthodontics, University of Rochester, Eastman Dental Center, 625 Elmwood Ave., Rochester, NY 14620, fax: 585-244-8772.

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Surgery
Third molar
Alveolar bone height

This is a controlled clinical and radiographic long-term study that looks at what effect keeping or removing the third molars has on the periodontal attachment at the distal of the second molars. This study was designed to be split mouth type where 25 patients had their infected third molar on one side surgically removed while leaving the other side intact.

They were followed up for 28 to 58 months (average of 38.14). They all had pre-operative and post-operative radiographs and post-operative clinical assessments that evaluated plot index, gingival index, probing depth, gingival margin position and clinical attachment level.

Although the types of impaction on the controlled side was not discussed, the surgical site had a combination of 68% partially impacted and 32% totally impacted third molars. Vertical (64%), mesial (32%) and

distal (4%) angulations were also noted. The third molars were in contact with the second molars in 76% of the cases. There were 40 males and 11 males, ages 20–58 years. The authors found no statistically significant difference in plot index, gingival index or probing depths.

Post-operative radiographic analysis revealed that the surgical site had a statistically significant increase of bone level (gain) distal to the second molars (an average of 0.662 mm + 0.28 mm). The control site, however, had an average bone loss of 0.176 mm. Thus, the experiment site and the control site were statistically significantly different.

The authors concluded that it seems that extractions or surgical removal of an infected third molar results in a significant increase in alveolar bone height distal to the second molar, but also suggest that a longer term follow-up study be done. This study had an average follow-up of 38 months.

Amir A. Krausz, Department of Oral and Maxillofacial Surgery, Unit of Periodontology, Rambam Medical Center, Technion Faculty of Medicine, P.O. Box 9602, Haifa, Israel, fax: 011-972-4-8542557.