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Scientific Editorial - Stability occlusion of Orthodontic Treatment – A 10 year study of a case report

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Abstract :

Orthodontic relapse is a major limitation and challenge in Orthodontic treatment. In this case report We have evaluated the post op occlusion and stability after ten years of treatment completion.

Key Words: Orthodontic Occlusion, relapse.

Introduction :

All occlusal traits relapsed gradually over time but remained stable from 5 years postretention [1].In this case a ten years follow up was done and the occlusion was evaluated for stability.

Case report :

A ten years follow up of a case. This case was done from 2005-2007 with Fixed orthodontic PEA Roth appliance . Class 1 malocclusion treated with 4 first premolar extraction and loop mechanics.The Upper retainer remained yet after a decade but the Lower fixed permanent bonded retainer was lost by patient after 3.5 years of treatment completion.

Pre Op Occlusion 2005

Post Op occlusion 2007

Post Op occlusion 2017 (31 is decayed and patient needed restoration)

The Case was seen at our dental office in 2017 October and the pictures were evaluated.

Result:

The relapse was minimal with fixed retention in upper and lost lower fixed retention arches. The occlusion was optimal and patient had no symptom of any TMD. It was concluded that the greater the quality of the orthodontic finished occlusion, the greater are the treatment changes and the amount of relapse and the better is the occlusal status at the postretention stage in Class I malocclusion treated with 4 premolar extractions.[2]

Refernces :

Stability of orthodontic treatment outcome: follow-up until 10 years postretention. Am J Orthod Dentofacial Orthop. 1999 Mar;115(3):300-4.
Influence of the quality of the finished occlusion on postretention occlusal relapse. Am J Orthod Dentofacial Orthop. 2007 Oct;132(4):428

Esthetic Gingival Contour Transfer for Anterior Implant Prosthetics

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Introduction

Anterior Implant Esthetics – three words that imply numerous and treacherous pitfalls and strike fear into the hearts of restorative dentists. Among the challenges is the accurate and predictable communication of proper final tissue contours to the dental laboratory.1,2 Only with proper communication of the gingival architecture, can the laboratory provide a natural appearing restoration.

Anatomical and esthetic gingival contours make or break the anterior case. A natural, healthy gingival architecture that mimics and blends with natural dentition is not only highly desirable but – in most cases – attainable. With proper placement of the implant body, adequate soft tissue and a temporary restoration that guides and shapes the tissue into lifelike contours an implant restoration in the anterior region can appear natural and beautiful. 3, 4, 5

Placement of the fixture – as referenced in numerous articles – is facilitated by good communication between the restorative dentist and the surgeon and is achieved through, accurate surgical guides.5 Proper orientation of the fixture is required in the mesio-distal, buccal-lingual and occluso-

gingival planes. When deficiencies in the hard and/or soft tissue prevent ideal placement of the fixtures then allografting and autografting techniques may be utilized to supply abundant soft tissue with which to create esthetic contours.

Once the implant is placed and the tissue has healed, sculpting of interproximal papillae and the buccal crescent of gingival are accomplished with sequential fixed temporaries.6, 7 Step wise addition of temporary material manipulates tissues to place and creates proper esthetic contours. Once accomplished, these contours must be accurately and predictably conveyed to the laboratory!

Enter the 'Custom Impression Coping'! By copying the final contours of the fixed, esthetic temporary restoration to an impression coping, gingival tissue is supported in the correct anatomical position during the impression procedure. This prevents tissue collapse during the impression phase and allows an accurate communication of the position of the soft tissue.

Case report:

A 55 year old female was sent by her surgeon to treatment plan an implant in the edentulous area of tooth #9 (upper left central incisor). The space had been occupied by an ill fitting and unaesthetic bonded pontic. The patient desired more natural and harmonious smile.

A surgical guide created by the restorative dentist in concert with the surgeon was used to place the implant in proper position. Healing took place over six (6) months at which time the fully integrated fixture was surgically exposed by removing a "plug" of tissue with a surgical trephine. A 5mm healing abutment was placed and the patient was immediately sent to the restorative dentist to begin tissue manipulation with the temporary restoration.

A screw retained temporary abutment (Biomet 3i, Palm Beach Gardens, FL) was air abraded using 50 micron alumina oxide (Danville Engineering, San Ramon, CA). The roughened temporary abutment was then coated with a bonding agent (Prime & Bond, Dentsply Caulk, Milford, DE) and a hybrid composite resin (Esthet-X, Dentsply Caulk, Milford, DE) was added to the screw retained temporary abutment head to shape the tissue to the desired gingival contours. The supra-gingival portion was created intraorally with the temporary abutment cylinder screwed into place. Once this was formed, the subgingival portion was created extraorally in the lab.

Over a period of several weeks, the temporary was modified by adding and subtracting composite subgingivally until it reached final esthetic contour and the surrounding tissues were in proper position. When these tissues were pink, firm, stable and healthy, an open impression tray was fabricated (Triad Transheet, Dentsply Prosthetics, York, PA). (Figure 1 and 2)

Figure 1: Screw retained implant provisional restoration at site 9, placed at time of implant uncovery.

Figure 2: Screw retained provisional following soft tissue healing and development of soft tissue contours and emergence profile.

It has been noted and documented that once the temporary restoration is removed, the gingival tissues tend to collapse and "slump" rather rapidly over the implant platform. Even a relatively fast impression with a standard impression coping will result in an inaccurate model of proper esthetic gingival contour. While some labs may be able to compensate for this by manipulation of the models, it is unpredictable and seldom as esthetically correct as the temporary restoration. The custom impression coping solves this problem.

Since the gingival portion of the temporary supports the tissue, this is the area that must be copied. The temporary restoration was secured to an appropriate a lab analogue and the tissue surface was lubricated (Dentsply Triad model release agent). A quick set lab stone (Grey Set FS. – Dental Mfg. Corp., Newark, NJ) was mixed using a vibrator and placed into a container. The lab analog and attached temporary restoration were inserted to the height of contour of the restoration and allowed to set. (Figure 3, 4 and 5)

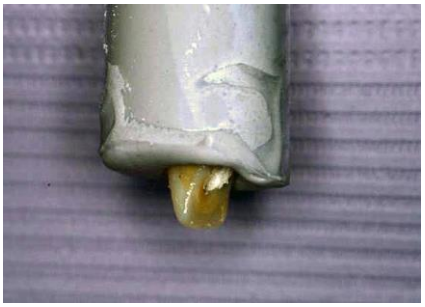

Figure 3: The screw retained provisional restoration affixed to an analog is immersed in model stone to the height of contour.

Figure 4: Incisal view of the screw retained provisional restoration affixed to the analog within the model stone.

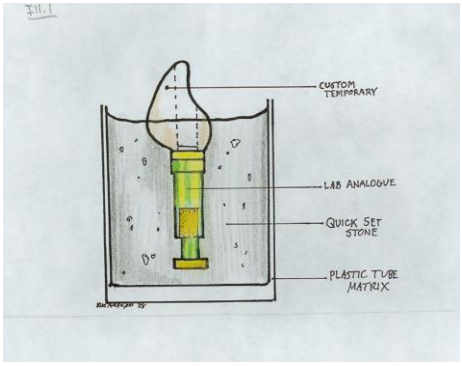

Figure 5: Illustration demonstrating the fabrication of the custom model matrix.

Once the stone was completely set, the temporary was unscrewed from the analogue and removed from the stone. The analogue remained at the bottom of a smooth, accurate impression of the contours of the temporary restoration making a mold to create the custom impression coping. (Figure 6)

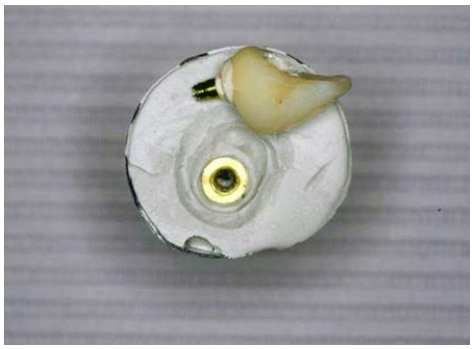

Figure 6: Screw retained provisional removed from the analog within the matrix demonstrating the matrix replicating the emergence profile achieved by the provisional.

A “stock” open tray impression coping was next used to create the custom impression coping. To aid in the adhesion of the custom material to the coping, the end of the coping facing the implant analogue, but avoiding the portion in contact with the analogs platform, was roughed up with a diamond (Brasseler USA, Savannah, GA) and air abraded as previously described to roughen the temporary abutment. The stone impression was lubricated with model release agent (name and company) and the impression coping, after being coated with bonding agent (Prime & Bond), was screwed onto the implant lab analogue embedded in the stone mold. (Figure 7 and 8) Flowable composite (Flow-it, Pentron Clinical Technologies, Wallingford, CT) was carefully injected around the coping into the stone mold and light cured in layers to ensure complete curing of the resin within the mold. (Figure 9) Alternatively, Duralay self cure resin (Reliance Dental, Worth, IL) may be used in place of the flowable composite resin.

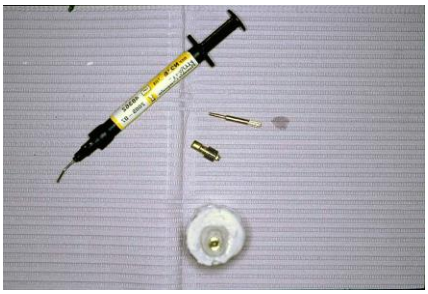

Figure 7: Materials used to fabricate the custom impression coping (custom matrix, flowable composite, open tray impression head and long pin)

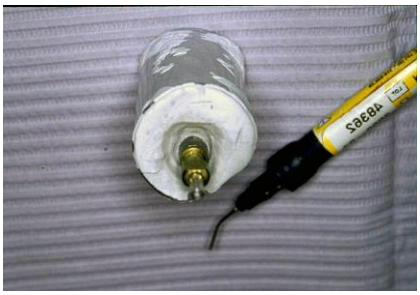

Figure 8: Custom matrix with open tray impression head placed on the analog.

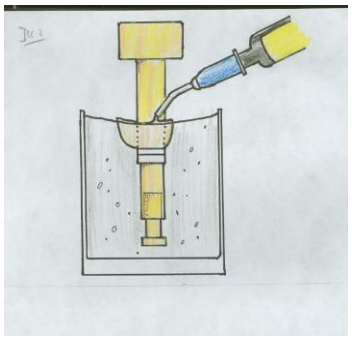

Figure 9: Illustration demonstrating fabrication of the custom impression coping.

Once cured, the coping was unscrewed from the implant analogue and removed from the stone mold. The perfect replica of the tissue portion of the temporary was then wiped with alcohol to remove uncured resin in the air inhibited layer. This replica – the custom impression coping – was ready for the final impression. (Figure 10)

Figure 10: Completed custom impression coping ready for intraoral use.

After orienting intraorally on the implant after removal of the temporary restoration, the custom impression coping was fixated to the implant via a long impression pin, supporting the soft tissue as the temporary restoration had previously. The tissues, properly supported, regained the desired contours created by the temporary. An open tray impression using a custom tray (Triad Transheet, Dentsply Prosthetics, York, PA) previously fabricated was filled with a polyether impression material (Impregum, 3M/ESPE, St. Paul, MN) was taken and sent to the lab along with an interocclusal bite record using a rigid PVS bite material (Correct Bite, Pentron Clinical Technologies, Wallingford, CT) and an opposing model. (Figure 11, 12 and 13) Additionally an impression of the temporaries was taken intraorally to aid the lab in seeing the desired crown contours and a stick bite to further define the incisal plane and midline.

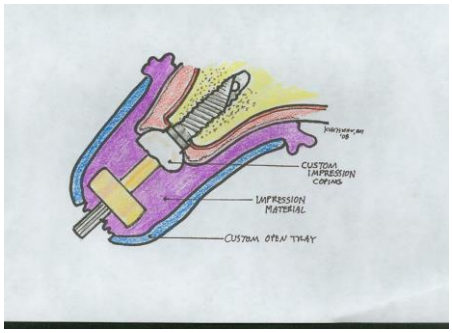

Figure 11: Illustration demonstrating how the custom impression coping is utilized.

Figure 12: Custom impression coping fixated intraorally supporting the soft tissue.

Figure 13: Open tray impression with custom open tray impression head embedded within.

The laboratory using the open tray impression with the custom impression coping was able to fabricate a soft tissue model. This replicates sulcus dimensions and gingival margin position as developed intraorally permitting the lab to design a restoration that mimic's what has been developed intraorally and provides natural esthetics.

On delivery, the restoration fit precisely and harmoniously with the natural and esthetic contours of the gingival. The implant supported restoration is indistinguishable from the adjacent teeth and is a functional and esthetic success. The guess work as to where the tissue will position after restoration placement is eliminated. (Figure 14)R4erf

Figure 14: Final restoration showing good soft tissue support and emergence profile replicating what was achieved with the provisional.

Conclusion

The key to esthetic results with implant fixed restorations is communication of the soft tissue position to the laboratory. We work hard to develop the position of the gingival margin and the emergence profile but when impressions are captured the soft tissue changes position. Tissue collapse occurs as soon as the provisional restoration is removed from the implant fixture.

The methods described herein, details a technique to replicate the soft tissue support and thus replicate the gingival margin position developed with the provisional restoration. Thus, the final restoration provides the esthetic results both the practitioner and patient have worked to develop in the provisional phase.

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3D Printing for training and practice in endodontics.- A Review

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Abstract:

3d Bio printing is the future of dentistry. Today we have printers that are exclusively dedicated to the dentists . With this background I would like to summarize in this paper how 3D technology could help us understand endodontics better.

Introduction :

Endodontics is one of the versatile fields of dentistry . Perhaps it is one branch of dentistry that has seen the highest turnover of technology in the shortest time period. In spite of such developments such as rotary and reciprocating handpiece and microscope , the root canal anatomy still remains one of the complicated anatomies in the human being considering the fact that pulp organ is one of the shortest organ as such in homosapiens.

Historically dentists are trained in dental school on extracted teeth before they work on the patients, a protocol strongly followed in perhaps every dental school of the world. Indeed this does give us a deeper insight into the anatomy of the pulp but still there are more complex anatomies of the pulp canals we see while working on the patient.

Example is the number of canals, the types of canals, the curvature of the canals, the location of apices , the accessory canals etc. With the advent of the CT scanning and 3D construction , we are able to see the tooth before we operate on the patient . Printing the tooth has been tried with many materials.

Discussion :

With use of FDM and Polyjet technologies , 3d model of the teeth were developed in a study by Keun-Young Lee et. Al [1] and the results were positive. The author concluded

that the replicas of teeth generated by the method were good and could be used in Orthodontics. The Bench practice could be largely improved when we have an accurate replica of the tooth. Such techniques may also help a seasoned clinician to try accessing the canals in a 3d model before starting the actual case. Although we have the BIOINK[2] application in printing tissues with Sodium Alginate , used in the developing cartilage tissue cells , the use of of materials such as hydroxyapatite is yet to be developed. This is important as the hardness varies with other materials such as PMMA .

Another Important study to quote here is by et. al [3] where the researchers tried to the 3D bioprinting of hDPCs mixtures , and made a mark that would help us incorporate 3DBioprinting in tooth regeneration

Conclusion:

Nothing is more interesting than working on a tooth that feels like one. In the near future , we should look at developing such tooth models that can replicate the natural tooth in anatomy as well as in the feel.

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