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Case Report

Re-Establishing the Lost Vertical Dimension and Posterior Edentulous Space Using Implant: A Case Report

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Abstract

Teeth must be chalky and tuneful with the dentition. Teeth engaged fundamentally as one of the main elements of smile. Edentulism solution exists for a tooth substitution such as bridge, dental implant, pivot tooth or denture. It is normal to wear of the occlusal surfaces of teeth slowly during the lifetime of a patient. The objective of esthetic revamping is to develop a peaceful and stable masticatory system, where the structures and joints all function in harmony (Peter Dawson). Successful therapy depends upon the understanding the interrelationship of all the structure involving the muscle, bone, tissue and joint.

Keywords: Vertical Dimension at Occlusion; Vertical Dimension at Rest; Implant; Bridge; Lost Vertical Dimension; Osseointegration

Introduction

Appearance of teeth must be chalky and tuneful with the dentition. Teeth engaged fundamentally as one of the main element of smile. Edentulism is the final degree of the periodontal disease. Imperfect treatment of decay teeth and a trauma are sufficient to lose a tooth. In all the case a solution exists for a tooth substitution such as bridge, dental implant, pivot tooth or denture, and it also depend upon the financial and local condition of the edentulism [1].

It is normal to wear of the occlusal surfaces of teeth slowly during the lifetime of a patient. But excessive result in pulpal pathology, occlusal conflict, diminished function, and esthetic disfigurement can be classified as attrition, abrasion, and erosion. There exists a combination of these condition. Hence, it is important to identify the main cause that contribute to worn dentition [2].

The objective of esthetic revamping is to develop a peaceful and stable masticatory system, where the structures and joints all function in harmony (Peter Dawson). Successful therapy depends upon the understanding the interrelationship of all the structure involving the muscle, bone, soft tissue, joints [9].

Increasing OVD based on the portion of interocclusal space required to restore the dentition to proper esthetics, form, and function. To increase OVD it should be followed up for several months. Normally the increase in OVD is accomplished with an occlusal splint or with the use of provisional restorations. Conventional fixed temporary restoration may wear during the assessment period or over the span of treatment. Sometimes loss of cement seal and permanent tooth preparation are additional problem [3].

Material and Method

This case represents 49 years old male, showed up in Dept of Prosthodontics Saraswati dental college luck now U.P with the chief complain of loss posterior dentition and unesthetic smile.

On radiogaphical and oral examination revealed that posterior maxillary bilateral edentulous space and mandibular class3 modification 2 related to the anterior space which is very unesthetic.

History reveals that patient have a habit of chewing gutkha and smoking cigarette.

After thorough patient education and examination we proceed with three implant in the second quadrant and two implant in the first quadrant with the open flap technique and its been frequently examined for the period of four months.

After successful osseointegration with the help diagnostic cast, we proceed with conventional method (NESWONGER METHOD) of verifying of OVD (OCLUSSAL VERTICAL DIMENTION) VDR (VERTICAL DIMENSION AT REST) should be 2mm more than OVD.

VDR = OVD + 2mm

OVD = VDR - 2mm

This measurement was transferred to the Hanau articulator by mounting the cast with the transferred facebow and the mandible with centric record.

Mock preparation was carried out in the diagnostics cast and waxing up of the cast was proceed for the fixed provisional restoration. Temporary fixed prosthesis were given and esthetic, function, comfort were assessed. Temporization period was for three months and the patient was routinely recalled for once in a week. After the patient is comfortable with the new bite then the permanent prosthesis were cemented.

Discussion

It is not surprising when molar teeth are missing or the vertical dimension of the jaw is abnormally reduced by a shrinkage of the alveolar ridge beneath plates or by the grinding away of the natural teeth, that the mandibular joint should assume an unaccustomed burden from this district and much of its structure be destroyed.

Figure 1: Pre-op.

Figure 2: Facebow record.

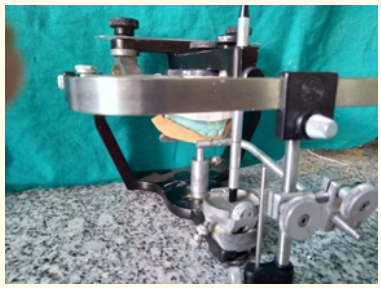

Figure 3: Facebow transferred.

Figure 4: Pre-op OPG.

Figure 5: Wax up.

Figure 6: Temporization.

Figure 7: Permanent crown cementation.

When this occurs, some of the force is thrown into the incisor region, but most of it is referred upward to the mandibular joint in direct line of the vertical dimension of the jaw. Proper regard for this function is the basis for testing the patient for the mandibular joint "syndrome" and is the basis on which the dentist proceeds to restore the position of the jaw. One of the outstanding faults of hit or miss applications in restoring lost vertical dimension is unbalanced occlusion, resulting in the traumatization of the teeth subjected to the increase in vertical dimension. Not only do the teeth and supporting structures suffer, but there are also cases of inter-articular disturbance of the temporomandibular joint resulting in pain and discomfort. The latter result no doubt is due to increasing the vertical dimension beyond the physiologic rest position of the mandible. So, first of all, we must have some means of arriving at the physiologic rest position before attempting to increase vertical dimension [4].

The natural teeth are attached to the alveolar bone by means of periodontal ligament fibers; whereas osseointegrated implant is rigidly anchored to the bone. This difference creates a potential biomechanical mismatch of the supporting units. Normal tooth display physiological movement in vertical, horizontal and rotational direction. The primary factors influencing this movement include the health of periodontium, number, length, diameter, shape and position of the roots. Tooth movement may be divided into two phase pattern. The first phase consists of rapid movement when the light force is applied and occurs as the periodontal ligament is compressed or stretched. During the second phase more linear movement occurred as the alveolar socket is elastically deformed. Secondary movement is observed when a secondary force is applied and is directly proportional to the amount of force. This measures up to 40 μ under considerably greater forces. Osseointegrated implants exhibit only linear movement during the entire loading cycle in proportion to the applied load without initial rapid movement due to lack of periodontal ligament. This movement is because of the viscoelastic nature of the bone [5].

The design of a definitive prosthesis must meet basic restorative requirements, such as function, phonetics, esthetics, and consideration of material properties. Monolithic TZP (TETRAGONAL ZIRCONIA POLYCRYSTAL) provides a high standard of esthetics and reduces the number of metals used in the oral cavity. Additionally, when vertical and horizontal resorption of tissue requires pink esthetic replacement, pink colored Zirconia can provide a stable and natural pink substructure to replace the lost tissue. This patient report presents an alternative method for the rehabilitation of a maxillary edentulous arch with a cement retained implant supported monolithic zirconia prosthesis. The patient was satisfied with the outcome of the treatment in terms of function, esthetics, and phonetics. Mechanical properties such as young's modulous, flexural strength, and hardness of TZP has been reported to be

higher than Ti alloy, stainless steel, Co-Cr alloy. It can be used on ceramic bridges, as long as the connector is appropriately designed to lower the maximum tensile stress applied on the connector. Additionally, the density of zirconia is about 6.1 g/cm3 which is 2 to 3 times lower than noble dental casting alloy. As a result, the final prosthesis fabricated from zirconia is lighter than the one made of metal alloy-porcelain. Ti alloy has a density of 4.5 g/cm3 which is lower than zirconia, but it has been reported that Ti alloy-acrylic prostheses require significant maintenance including the replacement of acrylic teeth and gingival architecture [6].

By the amount of the loss of VDO and available space to restore, Turner classified the treatment of a severely worn dentition. His classification and conventional treatment, with multiple crown-lengthening procedures, have been generally accepted. However, the etiology of worn dentition is multifactorial. Evidence lacking regarding the long-term outcomes of treatment methods and materials cause difficulty in clinical decision-making. Due to these unclear guidelines, adhesive strategy, that is more conservative and reversible, is frequently increased. For the composite resin restoration could not be used for the patient with severe loss VERTICAL DIMENSION ON OCCLUSSION [7].

Occlusal approach for restorative therapy can be either conformative approach (often advisable) or a reorganised approach. In conformative approach, occlusion is reconstructed according to the patient's existing intercuspal position. It is included when small amount of restorative treatment is needed.

It includes two situations

- Occlusion is untouched prior to tooth preparation although small changes can be made on restorations such as elimination of the non-working contacts.
- Occlusion is modified by localized occlusal adjustments before tooth preparation that is shortening of an opposing cusp, elimination of non-working side interferences and removal of a deflective contact on tooth to be restored [8].

Knowledge about functional occlusion, hinge axis, eccentric path, centric relation, occlusal vertical dimension and plane of occlusion is very much important to a successful fullmouth rehabilitation.

Conclusion

In this case report for posterior edentulous patient multidisciplinary approach followed by routine examination and thorough knowledge of physiologic occlusion has results in successful rehabilitation of restoring the lost vertical dimension of occlusion with the help of Implants, bridge, PFM individuals crowns restoring the natural tooth form. Maintaining the physiologic integrity in harmonious relationship with hard or soft tissues of the oral cavity.

Bibliography

1. B Guillaume. "Dental Implant: A Review". Elsevier Masson SAS (2016).
2. Mi-Young Song., *et al*. "Full mouth rehabilitation of the patient with severely worn dentition: a case report". *The Journal of Advanced Prosthodontics* 2 (2010): 106-110.
3. Soni Prasad., *et al*. "Altering occlusal vertical dimension provisionally with base metal onlays". *Clinical Reports - Journal of Prosthetic Dentistry* 5 (2008): 338-342.
4. Paul A. Edm and DDS. "RESTORING LOST VERTICAL DIMENSION". *Journal of the American dental Association and the Dental Cosmos* (1938): 80-86.
5. Vidya Kamalaksh Shenoy., *et al*. "Tooth implant supported Prosthesis: A Literature review". *Journal of Interdisciplinary Dentistry* 3 (2013): 3.
6. Ramtin Sadid-Zadeh., *et al*. "Maxillary cement retained implant supported monolithic zirconia prosthesis in a full mouth rehabilitation: a clinical report". *The Journal of Advanced Prosthodontics* 5 (2013): 209-217.
7. Mi-Young Song., *et al*. "Full mouth rehabilitation of the patient with severely worn dentition: a case report". *The Journal of Advanced Prosthodontics* 2 (2010): 106-110.
8. Bhawana Tiwari., *et al*. "Occlusal Concepts in Full Mouth Rehabilitation: An Overview". *The Journal of Indian Prosthodontic Society* (2014).
9. Mohan Bhuvaneswaran. "Principles of smile design". *Journal of Conservative Dentistry* 13 (2010): 4.