Visualizing, identifying and correcting occlusal surface anatomy post restoration in a deaf and mute patient: A novel approach.

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Abstract

Objective: During the composite restoration procedure and subsequent occlusal adjustment, the patient has to respond to operator's verbal commands regarding jaw and tongue movement. In a deaf and mute person, it is a big obstacle to achieve ideal operator-patient interaction during the procedure. The present study presents a novel method to mark occlusal high points before occlusal correction in deaf and mute patient.

Design: Novel treatment method designed by author

Setting: Can be utilized for single doctor or multi chair or multi doctor clinic or hospital setup

Conclusion: The presented techniques is low cost and reliable method to find occlusal highpoints after a composite restoration in a deaf and mute patient. These methods helps the operator to reliably modify the occlusal surface and prevent over-reduction or under-filling which can impair the final treatment outcome thus providing quality dental care to a functionally compromised group of patients.

Keywords: Auditory deficit, composite resin, deaf, dental occlusal adjustment, mute.

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Introduction

Dental management of patients with medical preconditions presents its own set of challenges. Each condition necessitates a specific knowledge set and practical experience from the operator to achieve an optimal solution. A unique challenge is presented by a deaf and mute patient.[1] Though not being different from others in terms of pre procedural requirement-pharmacological or otherwise, the difficulty encountered in these cases is due to lack of comprehensible communication between the operator and the patient.[2-3] It is further compounded if the patient is a child or not trained in standard sign language. The operator is unable to give commands to the patients or does it with difficulty with delayed patient response. Additionally, any emergency command (like moving tongue, opening mouth etc.) can't be relayed to the patient and may even cause a sense of panic in patient and staff both during the procedure.

In order to avoid such a situation, higher degree of patience and certain unorthodox techniques are required to safely achieve the preferred dental outcome. A novel approach was applied in such a case and is detailed as under.

Case Presentation

An 18-year-old female patient accompanied by her mother reported with the chief complaint of carious teeth. On examination two mandibular molars (36, 37) were found to be carious. Treatment plan included caries excavation and restoration using composites. Patient's entire history was elicited from the

mother. The patient was a non-syndromic congenitally deaf and mute person with no known history of any allergies or medication. Patient was not sent to any special school and was not taught any sign language. She communicated with the family with exaggerated loud grunts, hand movements and rudimentary lip reading.

This was her first visit to a dental clinic and she was visibly anxious. Hence all instructions were given to the mother who explained it to the patient. Also, the procedure was done slowly with ample breaks to preempt any sudden movement due to gagging or sudden jerks. Certain simple hand signs were explained to the patient indicating mouth opening, closing, spitting etc.

COVID-19 mandated extra precautions included double masks, eye protection and face shield. This further impeded patient's ability of lip reading and noticing facial expression. A specialized High-Efficiency Particulate Air (HEPA) filter unit (Eighteeth VacStation, Changzhou Sifary Technology Co. Ltd) was used to reduce aerosol spread. This may have also contributed to her anxiety. Before beginning patient was given an experience – akin to tell, show, do (TSD) - of the air rotor vibrations, water spray etc. felt during the caries removal process before going ahead.[5] After initial reluctance and fear she was cooperative and caries removal process was completed. Conventional procedure for composite filling was followed while avoiding over or under-filling of the cavity. After the light curing procedure patient was allowed to rest for a few minutes before occlusal adjustment was started using articulating papers (MDM Corporation, Delhi).

The challenge here was to guide the patient into centric occlusion while holding the articulating forceps. The patient could not hear or understand the command to close the mouth in centric occlusion/maximum intercuspation position (MIC). Visual demonstration was also unhelpful as she invariably closed her mouth in a protrusive position when unguided. After multiple attempts a technique innovation was conceived. The articulating teeth of the opposite arch (25 to 27) were vigorously rubbed with the articulating paper to transfer the blue color on their occlusal surface (Figure 1). The patient was then gently guided in MIC (Figure 2). This led to transfer of blue marks on the occlusal surface of the restored teeth. Subsequently, the required occlusal adjustment was done. The process was repeated till no high points were noticed in centric and eccentric movement. Finally, the restoration was polished using Shofu super snap polishing kit (Shofu Dental).

Discussion

The final step in a composite restoration is occlusal adjustment and it's finishing and polishing. Any high point which remains due to restoration can cause inconvenience in chewing and be a constant source of irritation. When left untreated it can have effect on the masticatory cycle, jaw movement and may even cause TMJ problems.[6-7] As a result obtaining a harmonious occlusion is of utmost importance.[8]

Common clinic method of occlusal restoration (also called selective grinding) [8] involve use of articulating papers of various thicknesses. In addition to articulating paper certain sprays like Arti-Spray (Bausch) and Okklean (DFS) are also available which coat the tooth with a mist of colored dye in thickness of 6-8µm.[9] However these are chiefly used in laboratory procedures and not in clinics.

The process of occlusal adjustment requires close coordination between the patient and the dentist. However, this is complicated when a patient is unable to communicate with the dentist as in the present case of a deaf and mute person. While methods such as sedation and use of general anesthesia are available, these are not possible in common day to day

practice due to cost and infrastructural reasons.

Another point of note is patient anxiety in a dental clinic.[10-12] An anxious patient is a recipe for failure. It is well known that the dental office is a source of anxiety for many patients. While there are many methods to reduce anxiety the most effective and indeed the primary method is communication between the patient and the dentist. This is severely limited in cases where the patient is unable to comprehend the dentist. Simple dental procedures might take more time and become complicated.

The above mentioned method of occlusal adjustment has its own set of advantages and challenges. Chiefly among the advantages: The dentist has greater control over guiding the jaw movements and can achieve better markings on the restored tooth. The patient can chew in a natural fashion without the encumbrance of a paper between teeth. The requirement of articulating forceps is done away with.

There are some challenges as well. Centric and eccentric movements have to be done separately and it might take some time to erase and repeat the markings. In absence of a paper thickness to guide, heavy or tight occlusion may be produced and it may cause trauma in the long term. The method is intended as a novel technique to overcome a unique issue. Further work in different setting may lead to refinement of the technique and is desired.

Conclusion

The author presents a simple and effective method of visualizing high points during occlusal adjustment in a deaf and mute patient. Managing such cases is a challenging task and different dental procedure will require multiple innovations to achieve an optimal result. This method can go a long way to improve clinical efficiency of the procedure and ensure a better dental experience for the patient.

Conflict of interest: The author declares no financial interest in any product mentioned.

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FIGURES

Figure 1

Figure 2