Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr ICV 2018= 82.06

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Case Report

Microbrush Stamp Technique for Direct Composite Resin Restoration-A Clinical Case Report

Fathima Shamra, Krishna Prasad, Bindhu Ghorpade, Nivedita Sajeev

Department of Conservative Dentistry and Endodontics, K.V.G Dental College and Hospital, Sullia, D.K

ABSTRACT:
Dentistry is in a phase in which the search for excellence became constant & the aesthetic standard is increasingly demanding even in the posterior segment of the mouth. The aim of the present study is to present a clinical case in which the Micro brush stamp technique was performed and to describe the restorative treatment in a patient with hidden caries. This technique makes the procedure faster by accurately copying the occlusal anatomy, allowing a little or no post restoration occlusal adjustments. It is an effective direct composite resin restoration in posterior teeth with hidden caries & extensive dentin involvement. The Micro brush stamp technique is an easy to follow procedure to recreate occlusal topography and allows for preservation of all anatomical details, but it is restricted to teeth with intact occlusal anatomy. The outcome of the final result surprised with restoration in terms of esthetic quality, despite the simplicity of the technique.
Key words: Impression Compound, Composite restoration, Dental aesthetics, Occlusal anatomy.

Received: 25 August, 2019 Revised: 8 October, 2019 Accepted: 12 October, 2019

Corresponding Author: Dr. Fathima Shamra, Department of Conservative Dentistry and Endodontics, K.V.G Dental College and Hospital, Sullia, D.K, India

This article may be cited as: Shamra F, Prasad K, Ghorpade B, Sajeev N. Microbrush Stamp Technique for Direct Composite Resin Restoration-A Clinical Case Report. J Adv Med Dent Scie Res 2019;7(12):90-94.

INTRODUCTION:
Dental aesthetics is devoted to restoring and enhancing the natural beauty of your smile using conservative, state-of-the-art procedures that will result in beautiful, long lasting smiles. Therefore, the recovering of teeth aesthetics comprises several procedures that test technical & scientific knowledge, artistic sense and skills of the professional on the current composites in order to recreate anatomical details and make the most natural restoration possible. The composite restorations for posterior teeth have been widely used on dentistry due to its better esthetics and more dental preserving cavities. Dental caries leads to lesions of calcified tissues, with demineralization & destruction of their inorganic and organic components. Occlusal surface are considered the most susceptible to caries lesions because of their morphology(1).

Despite the reduction in caries prevalence and need for restoration, hidden occlusal caries is a frequent finding in 14 to 20 year old(2). In posterior teeth, primary caries lesions may present on intact occlusal anatomy despite of the injury exceeds the DEJ in terms of depth. For these kind of cases, the literature describes a restoration technique using an occlusal stamp that allows to copy the original tooth morphology by using the existing clinical condition prior to the necessary destruction of tooth surface, reducing the time required for the post restoration occlusal adjustments.
In this technique, impression are made of teeth with hidden caries on which the superficial enamel is relatively intact, and this surface details are directly transferred to the composite resin restoration(3)(4). This type of cases are primarily diagnosed by radiographic examination or clinically by observing its bluish color

below the translucent enamel, there are some other methods for diagnosing hidden caries endoscopic evaluation (AcuCam), laser fluorescence methods (DIAGNOdent), digital fiber optic trans illumination, digitalized radiography, electrical caries monitor (ECM). The Micro Brush Stamp technique is therefore limited to carious lesions with intact occlusal anatomy that can be copied using a duplicate transfer device for subsequent recovery. The predictability simplicity & reduced clinical time of this method make it a satisfactory alternative to the conventional method, one of its main advantage is that it eliminates the sculpture stage and therefore reduces the time required to finish the restoration. This technique has evolved. For instance, I made a slight modification to the original technique by using impression compound to record the occlusal anatomy of the teeth. Various materials can be used to make the occlusal replica, including light curable material,(3)(5), chemically activated acrylic resin(6)(8)(7),polyvinylsiloxane bite registration material(9),transparent silicone moulds(10) & other commercial available occlusal transfer devices(4)(11).

CLINICAL CASE REPORT:

A 21 years-old male patient, systemically healthy was referred to the department of conservative dentistry KVGDC Sullia. After completing the required legal ethical paperwork and consent, clinical examination showed the presence of dark pigments on pits and fissures of mandibular second molar, without evidence of cavitation. The lesion was confined to the occlusal surface with relatively intact enamel (figure5). The patient did not report pain sensitivity in the dental history, but a radiolucent area in relation to the crown of the left mandibular second molar was observed through the intra oral periapical radiographic examination that suggested the presence of dentin carious lesion with no evidence of pulp involvement. In addition the patient's dietary habits, oral hygiene measures and the presence of active lesions elsewhere indicated the need for operative intervention. The clinical- restorative process started by performing the dental prophylaxis to remove the residues on the surface of the tooth and promote a proper color selection through the shade guide.Next, fabrication of microbrush stamp is done by dipping impression compound in to hot water to soften the impression compound (figure1). Take a small bit of impression compound and attach it to microbrush tip (figure2) and make a small triangle as shown in the figure(3). Dip base of the triangle (figure4) in hot water to soften it and then positioned under gentle pressure on the occlusal surface of the tooth to capture the occlusal morphology (figure6). The microbrush stamp was kept immobile for 10 secs, once set the stamp was removed and then cooled with cold water. Finally, the internal replica of the stamp was checked and trimmed the excess from proximal sides of the stamp (figure7).

Using small round bur, access to the carious lesion was gained through the pit and extended only to allow visualization and assessment of underlying dentinal caries. Using appropriate burs, peripheral caries excavation was carried out to remove soft carious dentine and fragile overhanging enamel only. Pulpal caries was then excavated using spoon excavator and extended only until there was moderate resistance to gentle excavation employing a minimally invasive approach (figure 8). 37% phosphoric acid etchant gel was used to etch the whole cavity and 1mm beyond the margins for 15 secs (figure 9), then the cavity was washed with distilled water for 20 secs and carefully dried with gentle airflow & cotton balls taking care not to desiccate the dentine. Adhesive was applied to the whole cavity and just 1mm beyond the margins, using a microbrush. Gentle airflow was then used until no ripples were evident.

This reduced the likelihood of adhesive pooling and confirmed that the solvent had evaporated. The adhesive was then light cured for 20 secs with the light tip as close to the cavity as possible (figure 10). The cavity was inspected to ensure that a uniform glossy/shiny adhesive layer coated the entire cavity. Subsequently light cured composite resin was accommodated in the cavity in a single increment of 2mm and then light cured for 40secs. Final increment of composite is placed (figure 11) and Teflon tape above that which will act as separator between un polymerized composite and stamp (figure 12), to facilitate adaptation & shaping of the final increment the Micro brush stamp was stabilize in the original anatomic position and pressed down firmly to the un polymerized composite resin (figure 13). Then the stamp is removed aswell the Teflon tape, excess composites flow in the proximal sides of the cavity which can be removed using simple hand instruments (figure 14). The next step was polymerization of the last resin increment across the occlusal surface, then light cured for 40 secs with the light tip as close to the cavity as possible (figure 15). Articulating paper was used to confirm that the restoration conformed precisely to the patients pre-existing occlusal scheme, in both the intercuspal position and all excursions. The restoration was inspected, at this stage the surface may be refined, polished or coated with a solvent free surface sealer, depending on operator preference (figure 16).

figure 1: softening of impression compound

figure 2: making of stamp

figure 3: making of triangle

figure 4: softening of stamp

figure 5: class I carious lesion in lower second molar

figure 6: stamp adapted to capture occlusal morphology

figure 7: reduction of stamp in proximal sides

figure 8: cavity preparation completed

figure 9: acid etch applied

figure 10: adhesive applied and cured

figure 11: last layer of unpolymerized composite

figure 12: teflon tape placed over the uncured restoration

figure 13: stamp re- applied to adapt final composite increment

figure 14: removal of composite excess from the sides of the tooth

figure 15: composite light cured

figure 16: completed restoration

DISCUSSION:

Faithfull reproduction of the original anatomy of the tooth, allowing the occlusal balance to be re-established and reducing the need for occlusal post restoration adjustments and the porosity of the resin composite. Risk of occlusal pre maturities in the restoration is substantially reduced and maintains the health of the periodontal and pulp complexes and of the entire stomatognathic system while also being esthetically acceptable (4). This technique can be carried out with several materials, impression compound is used because of its easy handling, low cost, impression precision and it can be reused. The limitation of this technique is related to the need to have the occlusal surface relatively intact and time spent confectioning the stamp.

CONCLUSION:

The micro brush stamp technique is effective for direct composite restoration in posterior teeth with hidden caries and extensive dentin involvement. This technique minimizes the operative time by eliminating post-restoration occlusal adjustments. The correct manipulation of this method easily and quickly renders a restoration matches the preoperative occlusal feature & provides optimal esthetics and function without altering the patient's occlusion. Hence, our results in this technique were considered successful. Thus this technique could be considered a practical alternative to conventional methods.

REFERENCES:

1. Botelho AM, Menezes TP, soares AC, Tavano KT. Hidden caries: the importance of a precocious diagnosis. Rev Ibero-am Odontol Estet dent 2005;13:12-20
2. Weerheijm KL, Groen HJ, Bast AJJ, keift JA, Kijkman MAJ, van Amerogen WE. Clinically undetected occlusal dentine caries: A radiographic comparison. Caries Res 1992;26(4):305-09
3. Mandarino F, Dinelli W, Oliveria Junior OB. A new technique of composite resin restoration in posterior teeth. RGO 1989; 37:460-6.
4. Castro JJ, Keogh TP, Cadaval RL, Planas AJ. A new system for the transferal of the occlusal morphology in posterior direct composite resin restorations, J Esthet Dent 1997;9:311-6.
5. Echeverria SR, Imparato JC. occlusal matrix technique: an alternative for anatomic structures restorations. J bras cline stet odontol 2000;24:49-52.
6. Barateri LN monterio S Jr, Correa M, Ritter AV. Posterior resin composite restorations: a new technique. Quintessence Int 1996;27:733-8
7. Zenker JE, alves ls, jinior LM. Restoring anatomy, function & aesthetics through the technique of occlusal replica. Clin Int J Bras Dent 2008;4:198-203
8. Guimaraes R, reis R. rebuilding occlusal morphology through the custom acrylic matrix technique-a clinical case report. Rev Ibero-am odontol estet dent 2004;10:154-9.
9. Liebenberg WH. Occlusal index-assisted restitution of esthetic and functional anatomy in direct tooth colored restorations Quintessence Int 1996;27:81-8
10. Goracci G, Mori G. esthetic and functional reproduction of occlusal morphology with composite resins. Compend contin educ dent 1999;20:643-8
11. Robles gijon v, lucena martin C, Gonzalez rodriguez MP, ferrer luque CM , navajas rodriguez de Mondelo HM. Odontol conservadora 1999;2:49-56.
12. Hamilton JC, Krestik KE, Dennison JB. Evaluation of custom occlusal matrix technique for posterior lignt-cured composites. Oper Dent 1998; 23:303-307.
13. Martos J, Silveira LM, Ferrer-Luque CM, GonzálezLópez S. Restoration of posterior teeth using occlusal matrix technique. Indian J. Dent. Res. 2010; 21:596-599.