



Case Report

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Direct posterior composite restorations using stamp technique-conventional and modified: A case series

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Abstract

"Stamp technique" for posterior composite restoration placements is a relatively new and novel method for duplicating occlusal anatomy with near perfection. Although convenient, it has found acceptance in only a small percentage of practitioners. The purpose of this article is to demonstrate and discuss the application of this technique under different scenarios, emphasizing the fact that it is reliable and predictable and when performed correctly, helps the practitioner to a great extent.

Keywords: Stamp technique, Occlusion, Composite resin.

INTRODUCTION

The second decade of the new millennium has shown an exponential progression in dentistry. From extractions to functional restorations, to finally, the era of 'bio-mimetic dentistry'. 'Bio-mimetic' literally translates to mimicking nature. Extraordinary esthetics which are only getting better with refinement of old techniques and introduction of newer ones.

However, manually crafting an esthetic direct composite restoration is a technique that requires experience and skill or finesse. One of the newer evolved techniques for achieving an amalgamation of both esthetics and function is the 'Stamp technique'.

This new technique consists of fabricating an occlusal index which records the occlusal anatomy of posterior teeth before cavity preparation^[1-3]. Thus obtained index is then pressed against the final composite increment before curing to achieve a positive replica of the pre-operative anatomy.

The only scenario in which stamp technique is therefore practicable is when the tooth being operated upon has intact anatomical features. This implies that occult caries with clinically unnoticeable cavitation can be restored by the stamp technique^[4-7].

This article discusses application of stamp technique using six different cases where conventional as well as modified methods have been used.

Case 1

A 29 year female patient reported to the clinic complaining of mild sensitivity to cold in upper left back tooth region. An oral examination revealed Class I caries on teeth 27, 28 (Figure 1). After thorough examination and deliberation it was decided to restore 28 using the stamp technique with putty (Figure 2). After making the index, a cavity for prepared in 28 (Figure 3), which was followed by etching with 37% orthophosphoric acid and bonding with 3M Universal bond. After placing the last increment of composite (3M Filtek Supreme), the index was placed back on the teeth to replicate the previous anatomy. After removing the index, the excess composite was removed and cured (Figure 4). This was the first attempt at using the stamp technique by the author.

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Figure 1: Intraoral view



Figure 2: Stamp made from putty impression material

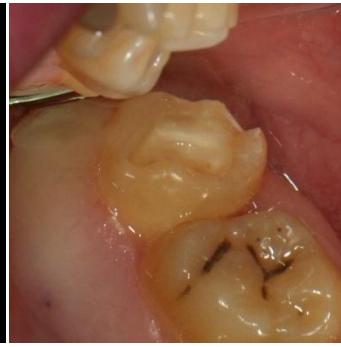


Figure 3: Cavity preparation



Figure 4: Final restoration

Case 2

A 20 years old male reported to the clinic complaining of a blackish discoloration of his lower right back tooth. Upon examining, a class I cavity was visualized on tooth 45 (Figure 5). After oral prophylaxis and rubber dam isolation, a small amount of flowable composite material (Filtek flow, 3M ESPE, St Paul, MN, USA) was placed on the occlusal surface of the affected tooth (Figure 6). An applicator brush tip was

then immersed into this composite and the composite was then cured (Figure 7). Following this, the cavity preparation was done (Figure 8). Then the last increment of composite (3M Filtek Supreme) (Figure 9) was cured after the occlusal stamp was placed back on the teeth to replicate the previous anatomy (Figure 10). Figures 11 and 12 demonstrate the final restoration after checking with a 20 microns articulating paper. This case utilized a single shade of composite.



Figure 5: Intraoral view

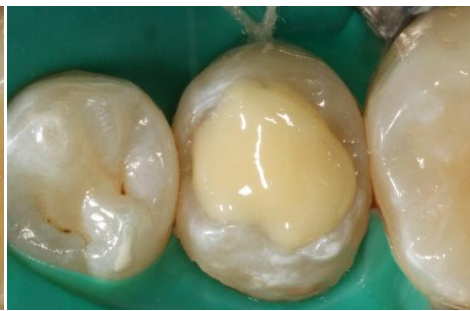


Figure 6: Flowable composite placed on the tooth



Figure 7: Microbrush is placed in the flowable material before curing



Figure 8: Cavity preparation



Figure 9: Composite placement



Figure 10: After stamping



Figure 11: Final restoration



Figure 12: Occlusion check

Case 3

The same patient as in case II has similar lesions on the contralateral side (Figure 13). Again the same technique was applied to obtain an

“occlusal stamp” (Figures 14). A cavity was prepared (Figure 15) and the restoration was completed using the same steps (Figures 16, 17, 18). In this case dual shades and tints were used.



Figure 13: Intraoral preoperative view



Figure 14: Stamp with microbrush and flowable composite



Figure 15: cavity preparation

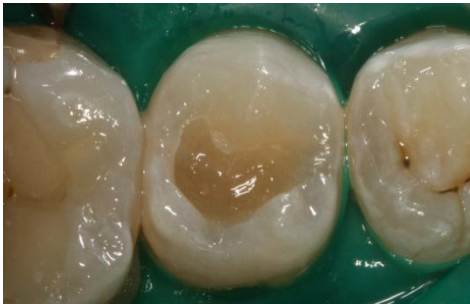


Figure 16: composite placement



Figure 17: Final restoration



Figure 18: Occlusion check

Case 4

A 43 year old female patient reported to the clinic complaining of pain in the lower right back tooth region. The diagnostic radiograph clearly demonstrated the hidden interproximal caries, from both the mesial and distal surfaces, requiring endodontic intervention (Figure 19). The

occlusal stamp in this case was made before the access cavity was made (Figure 20), caries removed and endodontic treatment completed (Figure 21). The post-obturation restoration was completed using the occlusal stamp to replicate the original pre-operative anatomy (Figure 22).



Figure 19: Intraoral and radiographic view

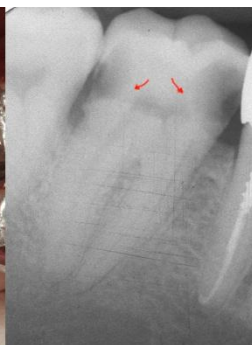


Figure 20: Stamp from composite and microbrush



Figure 21: Cavity preparation



Figure 22: Final view and radiographic view of endodontic treatment

Case 5

A 21 year old reported to the clinic for a restoration. When a large sized defect is present since a long time, it is often experienced that the antagonist tooth is drifted in the direction of the defect and after completion of the restoration proper occlusion with the antagonist

cannot be achieved. However, this can be avoided by the following method: During the preliminary layout of the mock up, the patient bites a layer of uncured composite and the expected anatomy is obtained and cured. Then this is used to predict the anatomy and utilized to make the final anatomical restoration by making a stamp of it (Figure 23-28).

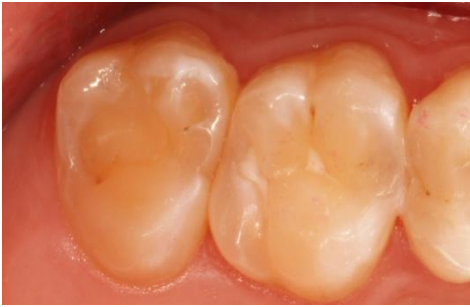


Figure 23: Preoperative view

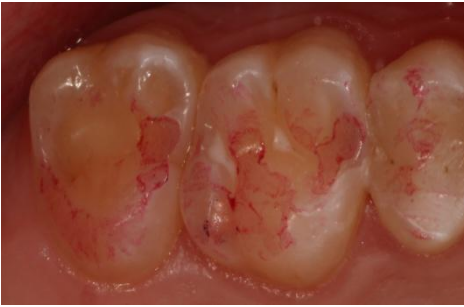


Figure 24: Occlusion check

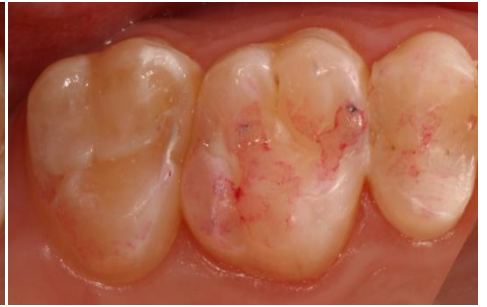


Figure 25: Composite placed patient bites to predict the final anatomy

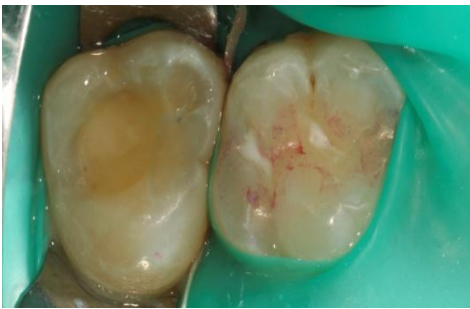


Figure 26: Cavity preparation



Figure 27: Composite placement



Figure 28: Final view

Case 6

A 56 year olds male reported to the clinic for replacement of his previous restoration in upper left back tooth region. A rather indirect technique was improvised, as in the presence of a relatively large defect, it is difficult to build up cusps accurately enough to occlude

with the antagonists. Here, a silicone impression and models of the teeth was obtained. After which wax was utilized to build the desired anatomy and an occlusal stamp was made from the wax which was consequently utilized to simulate a direct restoration on the affected tooth (Figures 29-34).



Figure 29: Preoperative view



Figure 30: Cast made based on initial situation

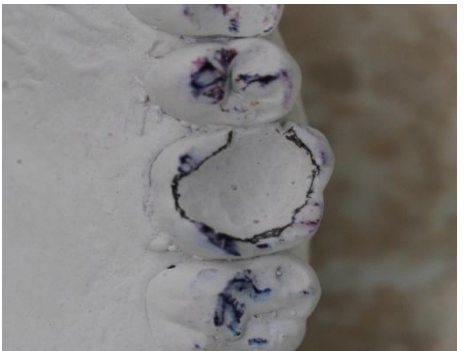


Figure 31: Cavity situation

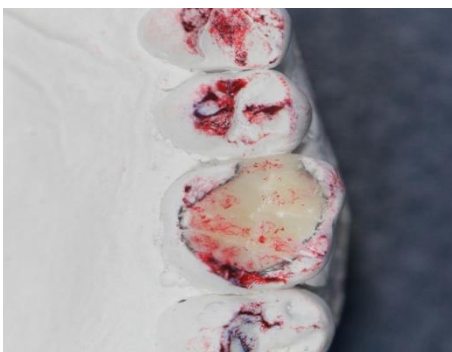


Figure 32: Filling on cast



Figure 33: Stamp made on filling on cast



Figure 34: Final intraoral view

DISCUSSION

In posterior teeth, primary carious lesions may present an intact occlusal morphology in spite of undermining at the dentinoenamel junction^[4]. With little or no damage to the enamel, there is destruction of the dentin underneath. In order to reach the necrotized dentin, a sufficient amount of healthy enamel has to be removed. Ergo the natural anatomy of the tooth which was present earlier is lost. In this lies the concept of using a composite stamp before the operative procedure.

The prevalence of dental caries has decreased in the last decades^[4]. Effective use of fluorides may be considered to be a major contributing factor towards this. Especially regarding the carious lesions on smooth surfaces^[8]. On the other hand, the massive introduction of different fluoridated agents seems to have masked i.e. undermined areas of dentin decay in absence of frank cavitation. This phenomenon has been identified as the 'fluoride bombs' and indicates the direct relationship of fluoride utilization with the increasing resistance of the enamel surface^[9].

Such lesions are occult in a sense that they possess an intact occlusal surface⁹ but with undermining decay that can be seen as an area of bluish/black discoloration under the enamel surface, or radiographically. Various other methods include endoscopy (AcuCam), laser fluorescence (DIAGNOdent), fiber-optic transillumination, digital radiography, electrical caries monitor and detection (ECM), among others^[10].

Like each and every technique this one has its own share of pros and cons which will be discussed and dealt with by the author.

The most highlighted pro is, perhaps, the reduced overall time once skill is mastered as the post-restoration finishing time is decreased due to almost instantly desired good cusp-fossa relationship. This is a boon for the busy practitioners and helps improve their reputation amongst patients^[1]. Furthermore, the degree of porosities present in the final restoration is considerably reduced. This is due to the fact that the stamp matrix exerts pressure on the composite, thereby decreasing formation of microbubbles as well as interference of oxygen with polymerization of the final layer of composite^[4]. These factors have been shown to be major determinants for long-term success of composite restorations^[11].

A relative con is that this technique requires skill and clinical acumen in order to be correctly performed. Even though this technique has been used for Class-II cavities^[1], however, it is not wrong to assume that a majority of cases where pre-operative anatomy is preserved is of pit and fissure caries i.e. Class-I cavities^[5-7]. As flowable composite is usually preferred in this technique, decreased strength is expected. Therefore, cases which are indicated for this technique should be selected.

Furthermore, time utilized for mastering and initially practicing this technique is considerable. But this can be easily overcome with practice. Also, it is imperative to mention that the correct and precise placement of the occlusal stamp is a pre-requisite to achieving the objective of obtaining accurate cusp-fossa relationship. Without this, distortions result consequently, thus nullifying the prime objective of the technique.

CONCLUSION

Stamp technique for direct composite restorations is a convenient, favorable and biomimetic procedure given the operator is skillful. The accuracy of topography replication is far greater than the plain manual method and can be adapted to unconventional cavities as well.

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