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## **A biomimetic approach for class 1 restorations using stamp technique: A case report**

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### **Abstract**

Minimal invasive dentistry advocates the principle of minimal loss of tooth structure along with its harmonious relationship with the surrounding hard and soft tissues. Proper occlusion in the form of its cusp-fossa relationship is essential to achieve post any restoration. This minimizes any sort of post-procedural discomfort to the patient. Stamp technique is a viable, simple and accurate procedure for the restoration of class 1 carious lesion in an aesthetic and biomimetic manner.

**Keywords:** Minimal invasive dentistry, stamp, cusp-fossa relationship

### **Introduction**

With the advent of modern clinical dentistry and its increased demand for aesthetic restoration, there has been a paradigm shift from the traditional silver – amalgam restoration to a more biomimetic tooth coloured restoration.

Depending upon the loss of tooth structure, either a direct or an indirect restoration is advocated. The restoration therapy poses several challenges such as obtaining proper contact and contour, achieving proper isolation, time consumption and its technique sensitivity involved<sup>[1]</sup>. However, not much consideration is given on achieving of a precise and detailed occlusion form. Discrepancies in the occlusion following a restoration, can prove detrimental to the treatment procedure and cause varied problems such as post-operative pain, difficulty in mastication and eventual fracture of the restoration leading to its failure<sup>[2]</sup>.

In order to achieve proper occlusal harmony and its precise detail to anatomy, a rather simple and novel method of “Stamp technique” has been introduced to restore small – to-moderate Class 1 carious lesions in the posterior quadrant region. It involves the preparation of an index prior to caries excavation, wherein this index is then submerged onto the last increment of the uncured composite restoration<sup>[3]</sup>. Its prime goal is the recreation of an exact replica of the occlusal anatomy of a tooth<sup>[4]</sup>.

This case-report highlights the use of stamp technique in restoration of Class 1 caries and its special consideration to Biomimetics.

### **Case Report-1**

A 22 year old male patient reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of decayed tooth in the lower right back tooth region. No pain was associated. Patient did not give any significant medical or previous dental history. On clinical examination, a Class 1 carious lesion was seen on the occlusal aspect of mandibular right third molar, which was mainly restricted on the pit and fissure region. Cuspal inclines were normal and no parafunctional habits were noted. Radiographically, an occlusal radiolucency was seen involving the enamel and a part of dentin. Following this, the patient was explained about the condition and the treatment protocol and a written consent was obtained. Oral prophylaxis was done followed by rubber dam isolation. A single coat of vaseline was applied onto the occlusal surface with an applicator tip. Following this, flowable composite was applied onto the occlusal surface, so as to record the occlusal detail.

The applicator tip was then inserted onto the uncured flowable composite and then, light curing was done for 30 seconds. The applicator tip, along with the fabricated occlusal index was then removed and kept aside. Caries was then excavated and the cavity surface and walls were cleaned and dried. Acid etching was done with 37% phosphoric acid for 15 seconds followed by washing by water for 10 seconds. The cavity was moist dried followed by bonding agent application in scrubbing motion for 15 seconds and air dried followed by light curing for 30 seconds. The cavity was then restored in an incremental technique by composite restoration leaving the occlusal 2mm of the cavity unrestored. Composite was then filled over the remaining cavity, however it was not cured. A strip of teflon tape was used to cover the occlusal surface and the fabricated stamp index was correctly placed and pressed towards the composite overlying the cavity. The teflon tape was then removed and the excess material was removed followed by light curing for 30 seconds. Slight finishing and polishing was done with Astropol finishing and polishing kit. The tooth was verified radiographically and the occlusion was checked for no high points.

### Discussion

With the advent of minimal intervention dentistry and a greater leaning towards the esthetic outlook, there has been several modifications in terms of techniques used and the material aspect for the restoration of posterior Class I carious lesions. Several factors come into play for the success of an ideal composite restoration, which primarily revolves on minimal polymerization shrinkage and proper cusp-fossa relationship with the opposing arch [5]. An ideal occlusal contour is desirable so as to produce an ideal replica of fissure-margin relation as compared to a healthy tooth [6].

The use of stamp technique in Class 1 carious lesions involves the replication of the occlusal anatomy, so as to mimic the natural tooth [7]. Its application is construed to tooth with intact cuspal planes and along the horizontal progression of caries involving enamel and dentin. Its merit involve less procedural time, less material consumption and ease of technique. Others advantages would be reduced chairside time as it bypasses the finishing and polishing procedure and its non-reliance on sophisticated instruments [9].

In this case report, flowable resin composite material was used so as to record the occlusal details of the carious tooth. Other materials which can be used for this purpose are pit and fissure sealants, pattern resin, polyvinylsiloxane impression material and bite registration paste [10]. Its prime aim should be its ability to record the minute details of the cavity and mimicking near-to-same occlusal outline [11].

Prior to the stamp preparation, no separating media or lubricating agent was used onto the occlusal surface of the tooth as it was a shallow carious lesion. In cases of moderate to deep carious lesion, separating media like vaseline should be applied, so as to cause easy removal of the stamp index and prevent any undue damage to the occlusal outline [12].

Following shade selection, composite restoration was placed in an incremental manner, so as to minimize C-factor and avoid polymerization shrinkage [13]. Prior to the placement of the final composite layer, a strip of teflon tape was placed over the cavity, over which the stamp index was pressed onto. This is done so as to prevent the sticking of the restoration to the index [14]. Proper and precise placement of the stamp is a pre-requisite for achieving proper cusp-fossa relationship. Use of this technique and its mastering would prove beneficial to both the patient and dentist and would comply with the concepts of Minimal Intervention Dentistry.



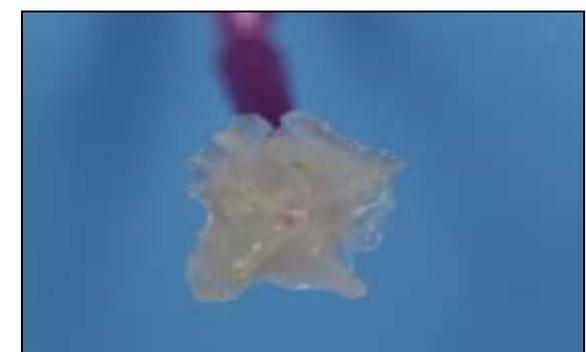
**Fig 1:** Pre-operative photograph



**Fig 2:** Rubber Dam isolation



**Fig 3:** Fabrication of stamp index



**Fig 4:** Stamp index



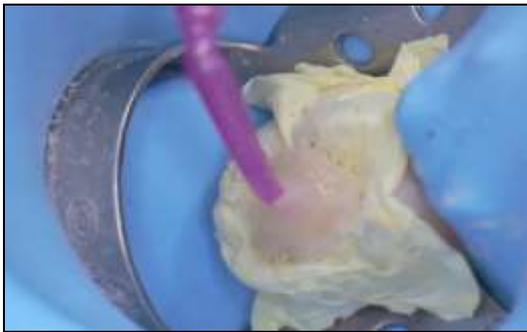
**Fig 5:** Caries removal



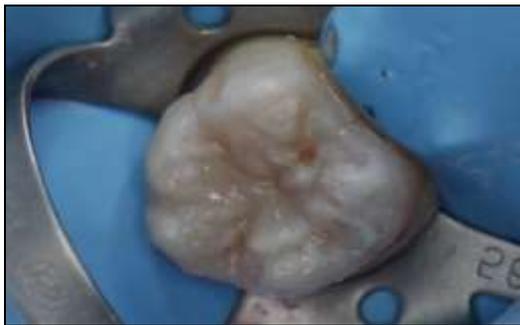
**Fig 6:** Etching with 37% phosphoric acid



**Fig 7:** Bonding agent application



**Fig 8:** Stamp impression over teflon tape



**Fig 9:** Final increment cured



**Fig 10:** Post-finishing and polishing.

## Conclusion

Stamp technique is a convenient and favourable technique in the restoration of Class I cavity lesions. Its main focus on time-saving and accurate replication would prove it to be far more advantageous than the conventional restoration procedure.

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