
A new horizon for tooth colored restorations using SR Adoro system – A case report

Snehal Sonarkar^{*1}, Ruchet Purba², Shishir Singh³, Rajesh Podar³ and Sangeeta Yadav⁴

¹Senior Lecturer, Department of Conservative Dentistry and Endodontics, VSPM Dental College and Research Centre, Nagpur, India

²Senior Lecturer, Department of Conservative Dentistry and Endodontics, SV Dental College, Bangalore, India

³Professor, Department of Conservative Dentistry and Endodontics, Terna Dental College, Navi Mumbai, India

⁴Reader, Department of Prosthodontics, Terna Dental College, Navi Mumbai, India

***Correspondence Info:**

Dr. Snehal Sonarkar

Department of Conservative Dentistry and Endodontics,
VSPM's Dental College and Research Center, Dighodh hills,
Hingna road, Nagpur (Maharashtra), India 440019

E-mail: snehalsonarkar@gmail.com

Abstracts

Direct and indirect composite resins have been considered as a bench mark for esthetic restorations. Recently, researches have been carried out in the field of material sciences for advancement in the properties of this material. This advancement in material sciences could be appreciated by the generations. Indirect resin composites have advanced in its properties from first to second generation. This case report describes about the restoration of badly broken down vital maxillary and mandibular first molar, by using indirect resin composites. SR Adoro system being a second generation indirect resin composite has been used for fabrication of restoration. Further, step by step laboratory and clinical procedures have been explained in detail.

Keywords: Esthetic, Indirect resin composites (IRC's), Inlay, Onlay, SR Adoro system.

1. Introduction

Tooth colored restorative materials have been considered as prime requisite in esthetic dentistry. In the past only anterior teeth were considered for esthetics, however demand for posterior esthetic restorations have also increased. Since introduction of composite resin numerous modifications have been done to fulfill the criteria for ideal restorative material.[1]

Composites resins are available as both direct and indirect restorative material. Moreover, there are many cases where we cannot use direct restorative material considering the tooth form and function, in such cases indirect restorative materials are preferred. The most important drawback of composite resin is polymerization shrinkage.[2,3]

Touati and Mörmann introduced the first generation of Indirect Resin Composites (IRCs) for posterior inlays and onlays in the 1980s.[4] The current esthetic restorative materials of choice are: direct composite resin restorations, Indirect Ceramic Restorations (ICRs). This paper will describe in detail about various steps in laboratory and clinical procedures involved in fabrication of IRCs

restoration by using SR Adoro system (Ivoclar Vivadent, Germany).

2. Case report

A seventeen year old female patient reported to the Department of Conservative Dentistry and Endodontics, with the chief complaint of decayed teeth in upper and lower right posterior region of jaw. Patient gave history of discolored teeth in posterior region of jaw since 5-6 years and there was no history of pain. On clinical examination occlusal caries involving proximal surface and arrested lesion involving the occlusal and buccal surface was seen with 16 and 46 respectively. Radiographically, radiolucency was seen in the coronal third of tooth which was not involving pulpal space and the vitality test gave vital results. The case was diagnosed as disto-palato-occlusal caries with 16 and bucco-occlusal caries with 46. The treatment decided was onlay with 16 and 26 using SR Adoro system. Patient was explained about other treatment options such as amalgam, direct composite resin and patient consent was taken after describing her about the treatment plan.

Isolation was done under rubber dam (Hygenic, Coltene Whaledent Inc. USA) (Figure 1a, 2a). Cavity preparation was made following fundamentals of cavity preparation.[5] Bevels should be avoided for IRCs restorations because it results in thin margins that are susceptible to chipping during function.[6] The carious tooth structure was removed and glass ionomer base was given with 46. (Figure 2b) Rubber dam was removed and gingival retraction was done with retraction cord (Ultrapak Cord #000, Ultradent Products Inc., South Jordan, UT, USA). Final impressions were made using silicone material (Silagum Putty, DMG, Hamburg, Germany, Figure 1b, 2c) and was followed by laboratory procedures.

2.1 Laboratory procedures

The models were fabricated and die preparation was done. SR Model Separator was applied twice and each layer was allowed to dry for 3 minutes. (Figure 1c, 2d) Thin layer of liner (thickness 150 µm) was applied on cavity walls and cavity floor and was precured for 20s. (Figure 1d) This curing leads to formation of inhibition layer which was removed with the help of disposable sponge. (Figure 2e)

Then layering of IRCs was done of which first layer was firmly pressed, placed and cured for 20s. (Figure 1e-1g, 2f-2h) Ensuring complete build up characterization was done with SR Adoro Stains

(Ivoclar Vivadent, Germany) and cured for 20s. (Figure 1h)

SR Gel was applied such that it completely covers the veneered surface and not too thick. (Figure 2i) The restoration was mounted on object holder and placed it in Lumamat 100 (Ivoclar Vivadent, Germany) with P1 as final curing programme. SR Gel was completely removed under running water or steamer after complete polymerization and was preceded by finishing. (Figure 1i, 2j)

2.2 Clinical procedure

Isolation was done so as to achieve dry field. The fabricated restoration was tried intraorally to check for marginal discrepancy. As there were no discrepancy the intaglio surface was treated with hydrofluoric acid and cavity surface was etched with 37% phosphoric acid (Ivoclar Vivadent, Schaan, Liechtenstein) for 10s (Figure 3a, 4a), rinsed for 30s and adhesive resin (TetricNBond, Ivoclar Vivadent, Schaan, Liechtenstein) was applied for 10s and light cured for 20s. (Figure 3b, 4b) Dual cure resin (Variolink N, Ivoclar Vivadent, Amherst, USA) was used for cementation and cured from all sides. Occlusion was checked by mandibular movements following BULL's law. (Figure 3c, 4c) There were no high points but if high points are seen they should be reduced and finishing and polishing should be done. (Figure 3d, 4d) The restoration was evaluated clinically for marginal fit, discoloration and sensitivity in duration of 1, 3, 6 and 1 year.

Figure 1: Isolation, impression, fabrication of restoration for maxillary molar

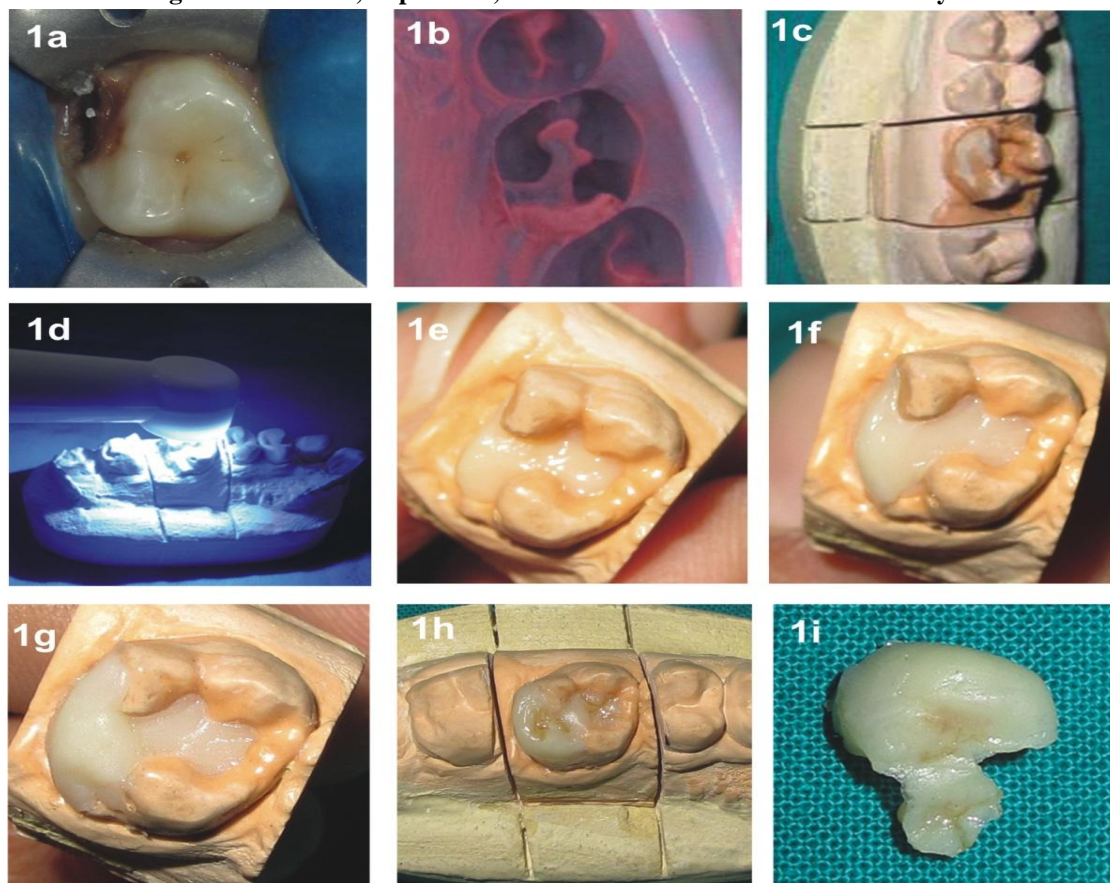


Figure 2: Isolation, impression, fabrication of restoration for mandibular molar.

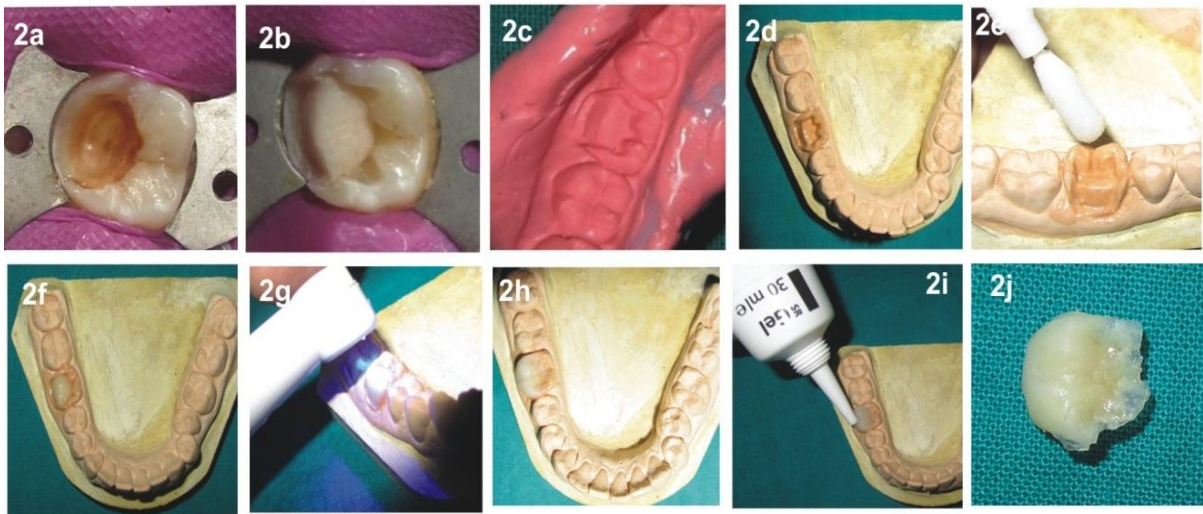


Figure 3: Clinical steps for restoration cementation in maxillary molar.

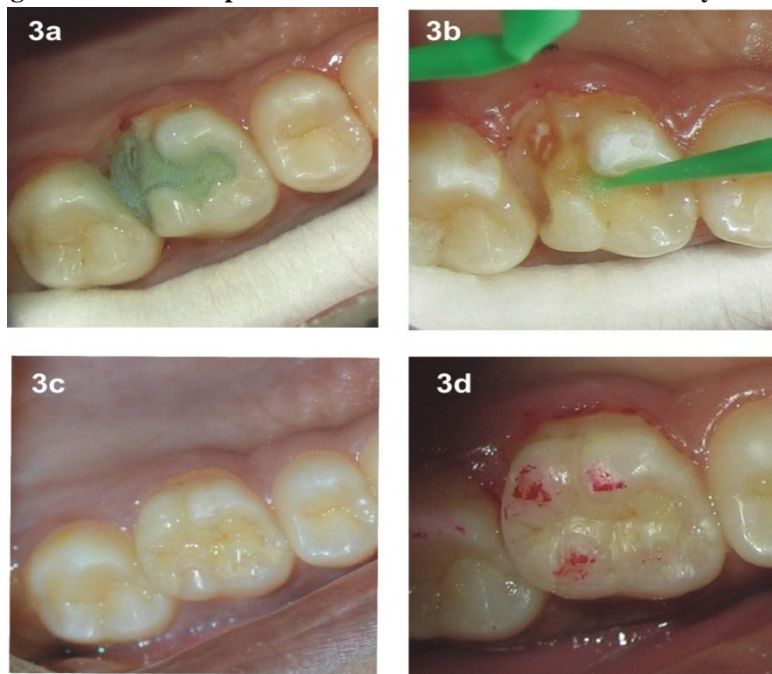
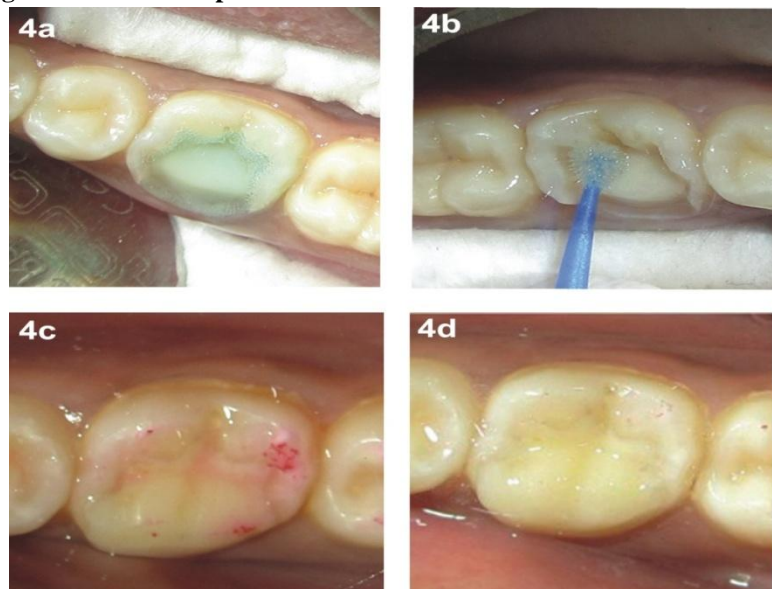


Figure 4: Clinical steps for restoration cementation in mandibular molar.



3. Discussion

Composite resin exhibits similar flexural strength, flexural modulus and hardness to teeth, when used as restorative material.[7] However, when Direct and IRCs were compared it was found that IRCs have better physical properties than direct composites.[5]

Loguercio *et al* and Thonemann *et al* stated that adhesive interface was unable to resist polymerization stresses in enamel-free cavity margins [8,9], resulting in improper sealing, microleakage, postoperative sensitivity, improper contact and contour and recurrent caries.[10-15] To minimize this disadvantages indirect restorations are preferred over direct restorations.[16]

SR Adoro system is second generation light activated heat cured IRCs composed of homogeneous microfilled composite and containing 64-65wt% of inorganic fillers.[17]

In the present case IRCs was chosen over porcelain as IRCs showed better marginal adaptation than ceramics[16], refractory dies (ceramic inlays) fractures easily resulting in microfracture.[18] There are other advantages of IRCs such as less marginal chipping [19], higher flexibility [20], and durability for about 24-52 months.[21] When compared to other IRCs (Signum, Belle Glass HP, Dialog, GC Gradia) SR Adoro system was found to have more abrasive resistance.[22] Both ceramic and composite inlays and only have advantages and disadvantages resulting in almost similar clinical behaviour.

4. Conclusion

The presented cases would pose great difficulty in restoring broad contact areas and optimal esthetics by direct method so IRCs like SR Adoro system was used. Although these teeth could also be restored with indirect ceramic restorations, SR Adoro provides an alternative economical approach in such cases.

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