

# Pizza Technique in Site 1 Restoration in Lower Second Molar Tooth : A Case Report

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**Pizza Technique in Site 1 Restoration in Lower Second Molar Tooth : A Case Report**Juni Jekti Nugroho<sup>1\*</sup>, Aries C Trilaksana<sup>1</sup>, Christine A Rovani<sup>1</sup>, Nurhayaty Natsir<sup>1</sup>, Farida Rahim<sup>1</sup><sup>4</sup> 1. Department of Conservative Dentistry, Faculty of Dentistry, Hasanuddin University, Makassar, Indonesia.**Abstract**

One of the techniques that can be used to achieve esthetic and functional posterior teeth is to make correct and accurate occlusal anatomy. The pizza technique is a modelling technique in which one increment is used for each cusp that resembles pizza slice in restoring occlusal cavity in the posterior tooth using direct resin composite. The aim of this case report to describe a novel technique in restoring a site 1 cavity in posterior teeth using direct resin composite that can be used to achieve esthetic and functional posterior teeth and to minimize polymerization shrinkage while at the same time generating a correct and precise occlusal anatomy. A 33 year old female patient came to the dental centre with D5, site 1, size 3 cavities in tooth 37 and the diagnosis was reversible pulpitis. The tooth will be restored using direct nanohybrid resin composite material with the pizza technique. The pizza technique is effective for class I direct composite resin restoration in the posterior tooth with hidden caries and extensive dentin involvement.

Case report (J Int Dent Med Res 2019; 12(2): 723-726)

<sup>12</sup> **Keywords:** Nanohybrid composite restoration, Pizza technique.**Received date:** 10 October 2018**Accept date:** 19 November 2018**Introduction**

According to the World Health Organization (WHO), dental caries are a major health problem worldwide with 60-90% prevalence in school-aged children and adults.<sup>1,2</sup> Caries are a common oral disease and result in loss of tooth structure and requires restoration to restore the function, form and aesthetic of the tooth.<sup>3-5</sup>

Composite resins are the most widely used restorative materials today. Factors contributing to the increased use of composite resin restorations is the introduction of minimally invasive restoration procedures that emphasize the maintenance of sound tooth structures and usage of adhesive materials in the posterior region.<sup>2,6-8</sup>

However, a composite resin has still drawbacks. This restoration has multiple procedures that are time-consuming and excellent operator skills and ability to achieved harmonious occlusal and cusp-fossa relationships with opposing teeth.<sup>6</sup>

Polymerization shrinkage is the most frequently encountered problem in composite resins. The distance between the monomer units in the polymer are closer than before the polymerization and undergo 2-6% volumetric contraction during the polymerization. This process forms a gap between the cavity wall and the restoration that can cause microleakage. This microleakage gives space for bacteria, liquids, molecules, and ion penetration. Microleakage is thought to be responsible for discoloration of marginal restorations and teeth, secondary caries, enamel fractures, and pulp sensitivity.<sup>9-13</sup> The application of composite resins with incremental techniques have been recommended to reduce residual stress at tooth restoration interface. This technique will decrease polymerization shrinkage due to a decrease the volume of the polymerized composite resin material. Several studies have suggested that the incremental technique is an ideal technique for composite resins application.<sup>14-16</sup>

Recently, a new technique, pizza technique or sectional technique has been proposed as modification of oblique technique by Manauta J and Salat A (Style Italiano, 2012), which each increment is made cusp by cusp that resembles a pizza slice<sup>17</sup>. With this technique, small cavity walls bind to the composite resin and thus has fewer tendencies to cause microleakage. In addition the occlusal anatomy, it can also be

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formed precisely and accurately so that the composite restoration will have good aesthetics and functionality.

### 5 Case Report

A 33 year old female patient came to the dental centre with complaints of caries in the lower molar teeth and aches while drinking cold water. Intraoral examination revealed D5, site 1, size 3 cavities in tooth 37 and the diagnosis was reversible pulpitis (Figure 1).

Anamnesis, clinical photos, radiographic photos, and diagnosis were performed to determine a treatment plan and gain informed consent. The tooth was isolated using a rubber dam followed by tooth preparation. The caries retrieval was carried out using a round diamond bur. Unsupported enamel was removed with bur tapered fissures. After that etching and bonding procedures followed by a 2 mm composite resin application on a cavity floor (Figure 2 and Figure 3).



Figure 1. Initial clinical feature.

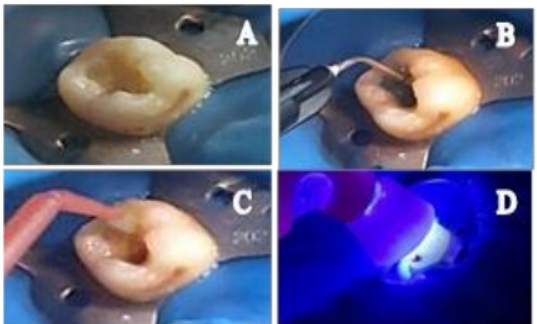


Figure 2. (A) Cavity preparation, (B) Etching application, (C) Bonding application, (D) Light curing for 10 seconds.

The pizza technique procedure starts from the mesiobuccal cusp with a thin layer of composite resin. Prior to polymerization, a slope formation is limited to the main sulcus. After the first cusps are polymerized further the formation of the distobuccal cusp. The formation of cusp distolingual and mesiolingual work in the clockwise direction. Slope formation is done using a rounded microplugger and a brush to smooth the slope and eliminate roughness (Figure 4). Finally, the tooth undergoes finishing and polishing (Figure 5).

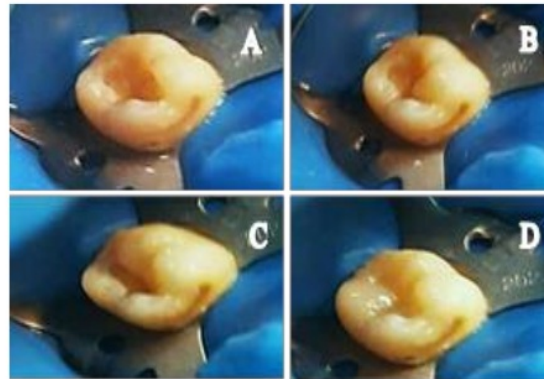


Figure 3. (A) Composite application at the cavity floor, (B) Cusp mesiobuccal developed with small increment, (C) Cusp distobuccal modelled, (D) Cusp distolingual modelled.

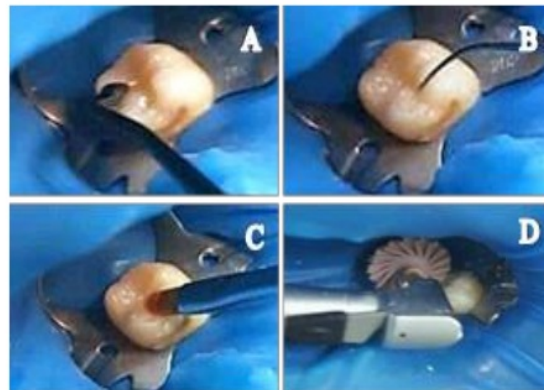


Figure 4. (A) Cusp mesiolingual modelled, (B) Slope with microplugger, (C) Brush to slope smoothing, (D) Polishing.

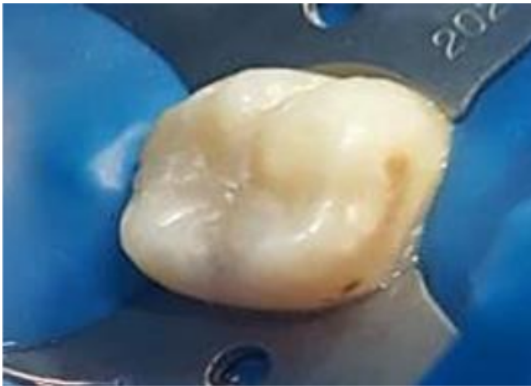


Figure 5. Final clinical feature.

### Discussion

Primary caries lesions of posterior teeth may present an intact occlusal structures despite the injury exceeds dentino enamel junction (DEJ) in terms of depth. To achieve necrotic dentin, a number of healthy emanels should be prepared. Consequently the natural anatomy of the existing tooth is lost.<sup>17,18</sup> Restoration of the composite resin in the posterior tooth is a challenge for the dentist because it requires recontouring of anatomical tooth surfaces.

One of the important issues to be considered of composite resins is polymerization shrinkage. Restoration techniques with composite resin materials should be able to reduce polymerization shrinkage.<sup>12</sup> During polymerization, the monomer volume is reduced and a gap occurs between the composite resin material and tooth structure. This causes reduced retention and increased leakage. Gaps occur<sup>7</sup> when the composite polymerization pressure is greater than the composite bond strength with the tooth structure.<sup>10,19,20</sup> Several methods for reducing polymerization shrinkage have been<sup>9</sup> reported in posterior restorations, such as the use of liner materials with a low elastic modulus, techniques of curing, and application technique of composite resin material.<sup>19,20</sup> <sup>3</sup>

Incremental technique has been reported to reduce microleakage with resin composite restoration. With this technique the cavity walls are bonded with less resin composites (small c-factor) and less contraction occur. The degree of polymerization higher due a thin layer of polymerized restorative material is proven reduces stress by polymerization and deflection

cusps.<sup>14,19,20</sup> Another advantage of this technique is adequate of light curing due to the thickness of the composite material applied maximum only 2 mm.<sup>19,20</sup>

Some incremental techniques for class I restoration have been used such as incremental horizontal, oblique incremental, and horizontal split. These techniques are considered quite complicated and time consuming.<sup>14,15,22,23</sup>

Currently, the pizza or sectional technique <sup>6</sup> a newly developed novel technique. Polymerization shrinkage can be minimized and at the same time generate a correct and precise occlusal anatomy. It has been well proven that single shade stratification techniques sole the majority of cases correctly. This technique is done by applying one increment for each cusp. Each one of these increments, when correctly modelled, resemble pizza slices. The procedure starts with the simple cusp and then a cusp is added one at a time to acquire more anatomical references and to define the remaining and more difficult structure. The composite resin application in this technique will minimize shrinkage stress by reducing the class I c-factor ratio <sup>8</sup> from 5 to 1. Cavity configuration factor, or c-factor, has been defined as the ratio of the bonded area to the free surface area of the cavity. Higher c-factors have been reported to produce higher shrinkage stress by limiting the flow capacity of resin composite. During the polymerization process, plastic deformation or flow composite resin occurs and a part of it compensates for shrinkage stress. Irreversible plastic deformation occurs during the early stages of polymerization, when shrinkage stress exceeds the elasticity limit of the composite resin. Within the polymerization process, contraction and flow decreases gradually as the material becomes more rigid. Flow compensation is <sup>7</sup> influenced by the cavity configuration factor. The higher c-factor the greater the shrinkage stress on adhesive bonds. Only a free surface <sup>13</sup> cavity act as a plastic deformation reservoir during the early stages of polymerization.<sup>22,24,25</sup>

### Conclusions

The pizza technique is effective for class I direct composite resin restoration in posterior tooth with hi<sup>6</sup>en caries and extensive dentin involvement. Polymerization shrinkage can be minimized and at the same time generate a correct and precise occlusal anatomy.

## 2 Declaration of Interest

The authors report no conflict of interest and the article is not funded or supported by any research grant.

## References

1. Kopperud SE, Staxrud F, Espelid I. The post-amalgam era: Norwegian dentist experience with composite resin and repair of defective amalgam restoration. *J. Environ. Res. Public Health*. 2016;13:441.
2. Lagerweij MD, Van Loveren C. Declining caries trends: Are we satisfied? *Curr Oral Health Rep*. 2015;2:212-17.
3. Diane RN, Ichrom N, Puspitasari D. Perbandingan jarak penyinaran dan ketebalan bahan terhadap kekerasan permukaan resin komposit tipe *bulk fill*. *Dentino (Jur. Ked. Gigi)* September 2017;2(2):211-214.
4. Sutono E, Rovani CA, Mattulada IK. When shrinkage is a problem, this restoration can be a choice: A case report, *Makassar Dent J*. 2017;6(2):45-9.
5. Achmad MH, Adam AM, Satria A. A cross sectional study of nutritional status among a group of school children in relation with gingivitis and dental caries severity. *J Dentomaxillofac Sci*. 2016;1(3):150-4
6. Fron C *et al*. Efficacy of composite versus ceramic inlays and onlays: Study protocol for the CECOIA randomized controlled trial. *Trials Journal*. 2013; 14:278.
7. Alshethe SA *et al*. The stamp technique for direct class II composite restoration: A case series. *J Conserv Dent*. 2016;19(5):490-3.
8. Lynch CD, Hayashi M, Seow LL. The management of detective resin composite restorations: Current trends in dental school teaching in Japan. *J Operative Dent* 2013;38(5):497-504.
9. Dhanashri B, Manwar NU, Manoj C. Comparative evaluation of microleakage with different composite placement technique in preparation with high C-factor. An *in vitro* Study. *J Dent Sci*. 2016;1(3):000117.
10. Pemana DP, Sujatmiko B, Yulianti R. Perbandingan tingkat kebocoran mikro resin komposit *bulk-fill* dengan teknik penempatan *oblique incremental* dan *bulk*. *Maj Ked Gi Ind*. 2016;2(3):135-40.
11. NairnWilson. *Essentials of esthetic dentistry*. 1st ed London: Elsevier. 2015;193-9.
12. Al Zahawi AR, Abdul Rahman MS, Ahmed SM. Effect of two different composite on gingival microleakage of class II restoration using four different placement techniques (An *in vitro* study). *IJRAMP*. 2015;2(9):727-31.
13. Yusri, Trilaksana AC, Rovani CA. Antioxidant effectivity to decrease coronal microleakage of composite resin restoration after intracoronal bleaching. *J Dentomaxillofac Sci*. 2016;1(3):158-62.
14. Roopa R Nadig *et al*. Effect of four different placement techniques on marginal microleakage in class II composite restoration: An *in vitro* study. *World J Dent*. 2011;2(2):111-6.
15. Oliviera KMC, Conasani S. Influence of filling techniques on shrinkage stress in dental composite restoration. *J Dent Sci*. 2013;8(1):53-60.
16. Heintze SD, Monreal D, Peschke A. Marginal quality of class II composite restorations place in bulk compared to an incremental technique: Evaluation with SEM and stereomicroscope. *J Adhes Dent* 2015;17:1-8.
17. Murashkin A. Direct posterior composite restoration using stamp technique-conventional and modified: A case series. *IJDR*. 2017;2(1):3-7.
18. Pompeu JGF, *et al*. Occlusal stamp technique for direct resin composite restoration: A clinical case report. *Int J Recent Sci Res*. 2016; 7(7): 12427-12430.
19. Soares CJ, *et al*. Polymerization shrinkage stress of composite resin and resin cements- What do we need to know? *Braz Oral Res*. 2017; 31(1): 49-61
20. Heymann HO, Rittler AV, Roberson TM. Introduction to composite resin. In: Roberson TM, Heymann HO, Swift EJ, editors. *Sturdevant's Art and Science of Operative Dentistry* 6<sup>th</sup> ed. St. Louis Mosby Elsevier. 2013; p. 216-288
21. El-Safty S, Silikas N, Watts DC. Creep deformation of restorative resin-composite intended for bulk-fill placement. *Dental Materials*. 2012; 28: 928-935
22. Katona A, Barrak I. Comparison of composite restoration techniques. *Interdisciplinary Description of Complex System*. 2016; 14(10): 101-115
23. Manauta J, Salat A. *Layers An atlas of composite resin stratification*. Style Italiano. 1<sup>st</sup> ed. Berlin Quintessence: 2012; 277-279
24. Karthrick K, Kailasam S, Priya G, Shankar S. Polymerization shrinkage of composite - A review. *JIADS*. 2011; 2(2): 32-36
25. Mondelli RFL, *et al*. Influence of composite resin volume and C-factor on the polymerization shrinkage. *Braz Dent Sci*. 2016 April; 19(2): 72-80

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