DOI: https://doi.org/10.53350/pjmhs211571637

ORIGINAL ARTICLE

Class I Composite Restorations Using Total-Etch Versus Selective Etch Adhesives

ZUHAIR ARIF[1], DILAWAR SULTAN[2], KINZA KHALID[3], AYESHA MAROOF[4], SYED ALI HAIDER[5], ESSA ARSHAD[6]
[1,2]Assistant Professor, Department of Operative Dentistry, Akhtar Saeed medical and dental college, Lahore, Pakistan.
[3,4,5,6] House Officer, Akhtar Saeed Medical & Dental College, Lahore, Pakistan.
Correspondence to Dr Zuhair Arif, Email: drzuhairarif@gmail.com

ABSTRACT

Background: Total etch versus selected etch adhesives can either be used.
Aim: To compare the clinical outcome of class 1 composite restorations using total-etch and selective etch adhesives.
Methods: 50 patients of class I restorations were included in this study. They were divided in two groups i.e. Group 1 for total etch technique, while Group 2 for selective etch technique.
Results: The mean ages in total etch technique were 27.72±5.26 years and 27.52±5.56 years in selected etch technique. There were 20 males (40%) and 30 females (60%) in total etch technique with male while in selected etch technique, 22 males (44%) and 28 females (56%). Selected etch technique was found to be more successful in clinical performance for Class I filling restorations (P<0.05).
Conclusion: Selected etch technique was found to be more successful in clinical performance for Class I filling restorations.
Keywords: Class I direct composition restoration, Etching.

INTRODUCTION

Direct posterior tooth color restoration has the advantage of restoring the structural and functional integrity of the tooth structure that is lost due to caries and providing esthetic satisfaction of the patient at the same time[1-3]. However, post operative sensitivity, marginal discoloration and secondary caries remain major concerns[4,5]. In addition to polymerization shrinkage adhesive strategy is also described as a factor affecting these problems[6]. Total etch technique provides us with good bond strength and less micro leakage[7]. However, there is postoperative sensitivity because of the discrepancy between dentin demineralization and acid penetration[8].

Selective etch technique is proposed as a solution to this problem. In selective etch technique self-etch adhesives are used with an additional step of selectively etching the enamel margins of the cavity with 37% phosphoric acid which completely demineralizes enamel and help in formation of stronger bonds with enamel. At 6 months secondary caries, postoperative sensitivity and marginal discoloration had acceptable results i.e., 100%, 94% and 72 %.[9-12]

In our setup such trial has not been published so far, and this will be the ever first time trial of its nature in our community. As patient presenting to our hospital are usually of low socio-economic status and the cavity is extended to the dentin, giving them repeated restorations is not affordable. So, it is to evaluate the effectiveness and to compare total etch with selective etch for enamel and dentin bonding.

The objective of this study was to compare the clinical outcome of class 1 composite restorations using total-etch and selective etch adhesives.

Received on 22-01-2021
Accepted on 09-06-2021

METHODOLOGY

The sample size was estimated as 50 cases. After permission from the Ethical Committee, following patients were selected: class 1 cavity patients having two similar cavities in contralateral quadrants, good oral hygiene and both genders. Following patients were excluded: Current smokers, betel nut users, patients with parafunctional habits, Already diagnosed cases of Hereditary disorders affecting tooth anatomy i.e. amelogenesis imperfecta, dentinogenesis imperfecta, dentin dysplasia, already diagnosed cases of Fluorosis (dark brown bands on teeth), non vital teeth, malocclusion i.e. rotated teeth, labial/lingual inclination and gingival/periodontal issues.

After taking informed consent and ethics approval 50 patients were selected. Shade selection was done by placing VITAPAN shade guide. After selecting shade tooth was isolated with rubber dam. Preparation for composite was prepared using round diamond bur. Patients were divided in to 2 groups i.e. group 1: total etch technique and group 2: selective etch technique.
Data analysis: According to modified USPHS criteria[6] at baseline (immediately after restoration) scoring alpha and bravo were counted as acceptable restorations and scoring Charlie was counted as unacceptable restorations. Clinical acceptability scores for each restoration at 6 months interval were calculated and compared with baseline score. Statistical analysis was conducted at a significance level of 5% (p<0.05).

RESULTS

The mean ages in total etch technique were 27.72±5.26 years and 27.52±5.56 years in selected etch technique (Table 1). There were 20 males (40%) and 30 females (60%) in total etch technique with male while in selected etch technique, 22 males (44%) and 28 females (56%) (Table 2). Selected etch technique was found to be more

successful in clinical performance for Class I filling restorations (P<0.05) (Table 3).

Table 1: Age distribution (n = 50)

Age (years)	Group 1	Group 2
18 – 24	7(26%)	8(30%)
25 – 31	12(50%)	11(44%)
32 – 38	6(24%)	6(26%)
Mean±SD	27.72±5.26	27.52±5.56

Table 2: Gender distribution (n = 50)

Gender	Group 1	Group 2
Male	10(40%)	11(44%)
Female	15(60%)	14(56%)
Male to female ratio	1:1.5	1:1.3

Table 3: Overall scoring in both groups (n = 50)

Overall score	Group 1	Group 2
Acceptable	19(76%)	23(82%)
Unacceptable	6(24%)	2(8%)

χ^2 = 4.24, df = 1, P =0.019

DISCUSSION

In the present study modified USPHS criteria was used which is in agreement with previous conducted studies because of the facts that USPHS criteria enable evaluation of multiple parameters and is a reliable scoring method to find out the success of restorations[13-15]. In the present study the success rate of restorations were found to be in agreement with the international literature i.e. around 94%[16-18]. This high success rate can be linked with good selection of tooth surface, proper etching of porcelain surfaces, proper application of adhesive and type of curing method used[19,20].

One of the factors that influence marginal performance at the cervical region is patients with satisfactory oral hygiene. The teeth that were found to be exposed because of abrasion and erosion were covered with veneers and it was found that tooth wear was in control at the end of study because of following the recommended brushing technique[21].

Hypersensitivity following restorations is more likely to be found with 2-step adhesives in comparison with the incidence of hypersensitivity following total etch 3-step technique. Hypersensitivity following restorations was more likely to be found in patients with previous history of dental erosions. In these cases usage of self-etching primer and bonding agent application resulted in relieve of hypersensitivity. In the present study there was no significant difference in hypersensitivity following restorations with 2-step adhesives in comparison with the incidence of hypersensitivity following total etch 3-step technique at all recall periods. Complete polymerization through porcelain veneer, complete curing for 40 seconds at all the aspects, and adequate light intensity of the curing light are few reasons of decrease incidence of postoperative sensitivity[22-24].

The level of satisfaction with shade of filling restorations are linked with factors related to patient and restorative specialist[25]. At the start of study all patients showed dark shade of restoration that remained stable over the next 5 years except the slight shade issue in first 7 days because of sorption. The stability of shade can be linked with selection of non-smoker cases and the type of adhesive material used[24,25].

In the current study the level of oral hygiene, amount of plaque / calculus deposits and health of gingiva adjacent to the restored teeth remained same at the start and end of study. There were slight occasional swelling and bleeding in addition to the change in shape of gingival embrasure. There are several limitations of this study, however, within these limitations the result of the present study showed that selected etch technique was found to be more successful in clinical performance for class I filling restorations.

CONCLUSION

Selected etch technique was found to be more successful in clinical performance for Class I filling restorations.

Conflict of interest: Nil

REFERENCES

1. Murashkin A. Direct posterior composite restorations using stamp technique-conventional and modified: A case series. IJDR. 2017;2(1):3-7.
2. Tekçe N, Aydemir S, Demirci M, Tuncer S, Sancak Eİ, Baydemir C. Clinical Performance of Direct Posterior Composite Restorations with and without Short Glass-fiber-reinforced Composite in Endodontically Treated Teeth: 3-year Results. The journal of adhesive dentistry. 2020 Mar 1;22(2):127-37.
3. Chandrasekhar V, Rudrapati L, Badami V, Tummala M. Incremental techniques in direct composite restoration. Journal of conservative dentistry: JCD. 2017 Nov;20(6):386.
4. Lu PY, Chiang YC. Restoring large defect of posterior tooth by indirect composite technique: A case report. Dentistry journal. 2018 Dec;6(4):54.
5. Zabrovsky A, Mahmoud R, Beyth N, Ben-Gal G. Direct posterior restorations: A 13-year survey of teaching trends and use of materials. Operative dentistry. 2018 Nov;43(6):E273-9.
6. Dettwiler C, Eggmann F, Matthisson L, Meller C, Weiger R, Connert T. Fluorescence-aided composite removal in directly restored permanent posterior teeth. Operative dentistry. 2020 Jan;45(1):62-70.
7. Azeem RA, Sureshbabu NM. Clinical performance of direct versus indirect composite restorations in posterior teeth: A systematic review. Journal of conservative dentistry: JCD. 2018 Jan;21(1):2.
8. Yalniz AM, Karacan AO, Cakar C, Bagis YH. Comparison of Microleakage of Class V Restoration with Self-etch and Selective-etch Adhesive Systems: An In Vitro Study. inflammation. 2019;23:25.
9. Karnady JA, Prahasti AE. Comparison of microleakage on Class V composite restoration: Study on total etch, self etch and selective etch technique. Scientific Dental Journal. 2019 May 1;3(2):47.
10. Atalay C, Ozgunaltay G, Yazici AR. Thirty-six-month clinical evaluation of different adhesive strategies of a universal adhesive. Clinical oral investigations. 2020 Apr;24(4):1569-78.
11. Oz FD, Ergin E, Canatan S. Twenty-four-month clinical performance of different universal adhesives in etch-and-rinse, selective etching and self-etch application modes in NCCL–a randomized controlled clinical trial. Journal of Applied Oral Science. 2019;27.
12. Ranjitha GR, Vikram R, Meena N, Vijayalakshmi L, Murthy CS. Clinical efficacy of universal adhesives for the restoration

of noncarious cervical lesions: A randomized clinical trial. Journal of Conservative Dentistry. 2020 May 1;23(3):227.
13. Marquillier T, Doméjean S, Le Clerc J, Chemla F, Gritsch K, Maurin JC, Millet P, Perard M, Grosgogeat B, Dursun E. The use of FDI criteria in clinical trials on direct dental restorations: A scoping review. Journal of dentistry. 2018 Jan 1;68:1-9.
14. Ceruttia A, Barabantib N, Özcanc M. Clinical Performance of Posterior Microhybrid Resin Composite Restorations Applied Using Regular and High-Power Mode Polymerization Protocols According to USPHS and SQUACE Criteria: 10-Year Randomized Controlled Split-Mouth Trial. J Adhes Dent. 2020 Jan 1;22:343-51.
15. Cavalheiro CP, Souza PS, Rocha RD, Mendes FM, Braga MM, Raggio DP, Lenzi TL. Choosing the Criteria for Clinical Evaluation of Composite Restorations: An Analysis of Impact on Reliabilty and Treatment Decision. Pesquisa Brasileira em Odontopediatria e Clínica Integrada. 2020;20.
16. Alvanforoush N, Palamara J, Wong RH, Burrow MF. Comparison between published clinical success of direct resin composite restorations in vital posterior teeth in 1995–2005 and 2006–2016 periods. Australian dental journal. 2017 Jun;62(2):132-45.
17. Kanzow P, Wiegand A. Retrospective analysis on the repair vs. replacement of composite restorations. Dental Materials. 2020 Jan 1;36(1):108-18.
18. Lempel E, Lovász BV, Bihari E, Krajczár K, Jeges S, Tóth Á, Szalma J. Long-term clinical evaluation of direct resin composite restorations in vital vs. endodontically treated posterior teeth—Retrospective study up to 13 years. Dental Materials. 2019 Sep 1;35(9):1308-18.
19. Sampaio FB, Özcan M, Gimenez TC, Moreira MS, Tedesco TK, Morimoto S. Effects of manufacturing methods on the survival rate of ceramic and indirect composite restorations: A systematic review and meta- analysis. Journal of Esthetic and Restorative Dentistry. 2019 Nov;31(6):561-71.
20. Costa TR, Rezende M, Sakamoto A, Bittencourt B, Dalzochio P, Loguercio AD, Reis A. Influence of adhesive type and placement technique on postoperative sensitivity in posterior composite restorations. Operative Dentistry. 2017 Mar;42(2):143-54.
21. Bhatti UA. The Phenomenon of Postoperative Sensitivity and Composite Restorations-A Review. JPDA. 2019 Jan;28(01):34.
22. Rezaei-Soufi L, Taheri M, Fekrazadas R, Farhadian M. Effect of 940 nm laser diode irradiation prior to bonding procedure on postoperative sensitivity following class II composite restorations: a split-mouth randomized clinical trial. Lasers in medical science. 2021 Jan 3:1-8.
23. Villavicencio-Espinoza CA, Narimatsu MH, Furuse AY. Using cross-polarized photography as a guide for selecting resin composite shade. Operative dentistry. 2018 Mar;43(2):113-20.
24. Carney MN, Johnston WM. The development of a novel shade selection program for fixed shade translucent dental materials. Journal of dentistry. 2017 Jul 1;62:81-4.
25. Massano G, Comba A, Garombo E, Baldi A, Alovisi M, Pasqualini D, Multari S, Scotti N. Direct Composite Restorations of Anterior Teeth: A Retrospective Clinical Study. Journal of Adhesive Dentistry. 2019 Sep 1;21(5).