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Compomer – Dyract- A Comparison of its Bond Strength And Microleakage with Composite Resin And Glass Ionomer – An in Vitro Study.

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Abstract: *The development of aesthetic and adhesive dentistry and the availability of reliable new dental materials have changed the daily practice of dentistry because these advances have led to more conservative cavity design and preservation of maximum sound dental tissues. The*
objective *of this study is to compare the bond strength and microleakage of Compomer with Composite and Glass ionomer (conventional and light cured); and also to study the tooth-restorative interface using SEM*
Materials and Method: *88 human premolar teeth extracted for orthodontic purposes were selected for this study, specimens were subjected to shearing stress in the Intron universal Testing machine & autoradiographs were assessed for depth of micro leakage. Photographs taken during scanning electron microscopic study of the interface between between dentine and restorative material were studied.*
Results: *Group 1 (Compomer-Dyract) has a significantly greater bond strength when compared with the other three groups (p<0.001)which was statistically highly significant. group 2 in which Dyract-Compomer was applied after enamel etching showed the least micro leakage score.*
Conclusion: *The present investigation lead to the conclusion that Compomer–Dyract had superior bondstrength and least microleakage than glass ionomer & omposite resins*
Keywords : *Compomer**,** Glass Ionomer, Composite Resins, Bond Strength, Microleakage.*

I. Introduction

The development of aesthetic and adhesive dentistry and the availability of reliable new dental materials have changed the daily practice of dentistry because these advances have led to more conservative cavity design and preservation of maximum sound dental tissues.The adhesion between Composite resin and dentine has been improved by introduction of newer generation dentine adhesives or sandwich technique by which Glass ionomer cement works as a kind of bonding agent as well as dentine substitute[1]. Although many physical properties of newer Composite resin have been improved, Polymerization shrinkage and its attendant consequences plague the longevity of direct resin restoration after 10 years of clinical observation[2]. In spite of fluoride release, its acceptance has been limited by the relative difficulty to use Since its introduction by

WILSON & KENT in 1972[3], Glass ionomers have received much attention, mainly due to the advantages it provides to the clinical dentistry in terms of fluoride release[4,5], and adhesion to dentine[6]. But, Conventional glass ionomer suffer from disadvantages like short working time and long setting times, low fracture resistance and low flexural strengths, tendency to undergo surface crazing during desiccation and becomes chalky if contaminated by moisture during early setting reaction.

Light hardened glass ionomer/resin restorative material was introduced by CROLL AND KILLIAN in 1990[7]; with 80% glass ionomer and 20% light polymerized resin component; which exhibits the beneficial properties of glass ionomers & composite resins including excellent biocompatibility & adequate pulpal tolerance, coefficient of thermal expansion similar to that of tooth thereby providing good compressive strength, chemical bonding to tooth structure, fluoride release that gives the material anticariogenic properties, tooth colored and availability in various shades and insolubility in oral fluids.

Another addition to this group of hybrid materials, COMPOMER DYRACT (Dentsply USA) ‘ polyacid modified composite resin[8] intrioduced in 1994 show benefits of both glass ionomer and composite resins with good mechanical properties, biocompatibility, tooth adhesion good retention and marginal seal, fluoride release, excellent aesthetics, available as single component radiopaque system in compules with no mixing needed, easy manipulation & placement, less water sensitivity and no enamel etching necessary.

Indication for this material includes Class I & II cavities in primary teeth, Class V lesions & cervical abrasion/erosion lesions, core build up and class III cavities. DYRACT contain fluoro-silicate glass in a matrix of acidic polymerizable monomers & other light-curing polymers.

This study was conducted with the aim of comparing the bond strength and microleakage of Compomer with Composite and Glass ionomer (conventional and light cured); and also to study the tooth-restorative interface using SEM.

II. Materials And Methods

88 human premolar teeth extracted for orthodontic purposes were selected for this study.
Preparation of the teeth: the teeth were scrubbed, cleaned and checked for any developmental defects or caries. Then, stored in distilled water containing a few thymol crystals as disinfectant. After a few days, the teeth were removed from the thymol solution and stores in distilled water until the beginning of the experiment.

The teeth were divided into three major groups:-
Group A: - Consisting of 48 premolar teeth, used to test the marginal integrity of the four restorative materials.
Group B:-Consisting of 48 premolar teeth, used to test the marginal integrity of the four restorative materials.
Group C:-Consisting of 8 premolar teeth, used to study the restorative material-tooth interface using Scanning Electron Microscope.

Group A& Group C were again divided into 4sub-groups and groups B into 6 sub-groups.
Group A (8 teeth in each group) and **Group C** (2 teeth in each group)
Group 1- COMPOMER- DYRACT
Group 2 – Conventional glass Ionomer
Group 3- Light cured glass Ionomer
Group 4- Posterior Composite.
Group B (8 teeth in each group)-
Group 1- COMPOMER- DYRACT applied without enamel etching
Group 2 – COMPOMER- DYRACT applied with enamel etching
Group 3- Conventional glass Ionomer
Group 4- Light cured glass Ionomer
Group 5- Posterior Composite
Group 6- Control teeth without any filling

III. Materials & Devices used

1) Restorative materials
(i) DYRACT – COMPOMER (Dentsply International INC, Milford USA)
(ii) Fuji II Glass Ionomer (GC International Corp; Japan)
(iii) Fuji II light Cured Glass Ionomer:- (GC Dental Industrial Corp, Japan)
(iv) TPH Posterior Composites:- (Caulk, Dentsplay, U.S.A)

The specimen were placed in separate mesh bags and thermocycled after 24 hrs in water baths of 5^0C and 55^0C for 500 cycles with a dwell time of 30 seconds.

Group B: Determination of Shear bond Strength

The specimens were subjected to shearing stress in the Instron universal Testing machine. The specimen was placed in such a position that the load was applied parallel to the tooth-material interface. A flat pointed knife kept parallel to the bonded area was used to shear the specimen at across head speed of 1mm/mnt. The point at which the material snapped off from the dentine surface indicated the breaking load. The readings were obtained in Kilograms. Shear Bond Strength was calculated by the equation,.Shear Bond Strength = Load / Area. The results were tabulated and further statistical analysis was done individually and tested by using the test of equality of means for small samples, the student 't' test.

Group B: Determination of Micro leakage by Auto radiographic Technique using radio isotope P^{32} as a tracer.

Standardization of the immersion time in isotope solution and exposure time on X-ray film was done by a pilot study. Class I cavities of dimensions 4 mm x2mmx2mm were cut on the teeth using a No.51 diamond fissure burin a high speed airotor hand piece with water coolant. Size of the cavities was standardized using a calibrated periodontal probe. The cavities were thoroughly cleaned with pumice slurry and fried, then filled with the respective restorative materials according to manufacturer's instructions.

For group 2, before filling with DYRACT- COMPOMER, the enamel margins were etched with 30% phosphoric acid for 15 seconds, washed and dried.

After thermo cycling, the surface of the teeth was coated with nail varnish excepted for 1 mm around the tooth-restorative margins. At the apical end of each tooth, a hole was drilled and string passed through it. Each group was then tied together and immersed in isotope solution containing labeled P32, for 24 hrs. The radio isotope was obtained from BARC Bombay. The actual activity from the source was confirmed by counting in a Liquid Scintillation counter (LKB).

The specimens were hung from a wire so that only the crown portions were immersed in the isotope solution.,ie, to prevent leakage of isotope through the apex.

Characteristics of the Isotope P^{32}:-

Automatic weight	-	32
Automic number	-	15
Half life	-	14 Days
Principal emission (β)	-	1.709 Mev

Precautions:-handing of isotope was done inside the Fume Hood, by using disposable syringes and double gloves, with care taken not to spill the solution. After 24 hrs the specimens were taken out and washed under running water for 1 hour, again washed with detergent and water for another 1 hour. Any residual isotope contamination of the wash basin was rules out by doing the "wipe" test ie, a blotting paper is kept near the orifice of the wash basin and checked in the Liquid Scintillation counter for any radioactivity.

The autoradiographs were assessed for depth of micro leakage using the scoring criteria as follows:-

Grade 0- No evidence of isotope penetration
Grade 1- Isotope penetration less than half of one wall, but not involving the floor.
Grade 3-Isotope penetration involving one full wall and less than half of the floor.
Grade 4- Isotope penetration involving one full wall and more than half the floor.
Grade 5- Isotope penetration involving one wall, floor and part of the other wall also.
Grade 6 - Isotope penetration involving both the walls and the floor.

IV. Results

The results were analyzed and tabulated into these groups:_

Group A:- The results obtained for shear bond strengths of the four restorative materials to dentine, tested using Instron Universal testing machine, were statistically analysed.

Group B:-The marginal sealing capacity of the four restorative materials to teeth, assessed by autoradiographic technique using radioisotope P^{32} as a tracer, were statistically analyzed.

Group C:- Photographs taken during scanning electron microscopic study of the interface between between dentine and restorative materials were interpreted.

Table 1-4 shows the bond strength values obtained for all the samples in each group at the tooth –material interface.

From table 5, it is evident that the mean shear bond strength of the group with DYRACT-COMPOMER (14.91 MPa) is appreciably greater than that of other groups; which is followed by Posterior Composite group (10.01 MPa), and light cured Glass lonomer group (8.3 Mpa) Conventional Glass Ionomer group showed the least bond strength to dentine (2.6MPa). The mean bond strength values of the four groups were statistically analyzed. Student 't' test was performed (the test of equality of means for small samples) to determine the level of significance between the group. Group 1 (COMPOMER-DYRACT) has a significantly greater bond strength when compared with the other three groups ($p<0.001$)which was statistically highly significant. Auto radiographic method was used to evaluate the marginal integrity of the restorative materials to teeth. The isotope penetration was graded according to the scoring criteria described earlier with a scale of 0-6, by observing the autoradiographs through the X-ray viewer and with the help of a magnifying lens.

Table 7 shows the scores of micro leakage observed with the various groups. It is seen that group 2 in which DYRACT-COMPOMER was applied after enamel etching showed the least micro leakage score, with a mean of 0.125. Also it produced a perfect seal (score 0) in 7 out of 8 samples. Group 1, DYRACT-COMPOMER without enamel etching, showed the second least micro leakage scores, ie, minimum of 0 and maximum of 3, with mean score of 1 which is followed by Group 5 (posterior composites) with a mean score 2 and Group 4 (light cured glass ionomer) with a mean score of 2.375. Group 3 (conventional glass ionomer) exhibited the greatest micro leakage scores, is, minimum score of 3 and maximum score 0f 6 with a mean score of 5. The microleakage scores, being non-parametric values, statistical analysis of the various groups were performed using the Wilkcoxan's rank sum test[12].

Group 1 (COMPOMER-DYRACT without acid etching) showed the second least microleakage scores which is also highly significant when compared with groups 3,4 & 5 ($P<0.001$) group 1 & 2 also showed a significant difference in microleakage scores ($P<0.05$) ie., enamel etching reduced or almost eliminated the microleakage of DYRACT – COMPOMER.
Results are also graphically represented (Fig. 8 & 9).
Group C:- Assessment of ion exchange zone and resin-inter diffusion zone at the tooth-material interface using Scanning Electron Microscope.
On examination of specimens, a few localized interfaces were noted. These can be categorized as-
Type I: - Complete and hermetic contact between the dentine, resin or base and restoration.
Type II: - Cohesive failure of the bonding material, leaving both the dentine surface and restoration coated with the bonding resin/base material.
Type III: - combined cohesive/adhesive failure, with the bonding resin or base material present on both tooth and restoration surfaces, but showing discrete areas of loss of bond of either surface.
Type IV: - Complete loss of adhesion to the restoration, but bonding agent retained by the tooth.
In all Glass Ionomer cement tooth specimens, there was evidence of large intra-cement fractures. It was a consistent finding that the dentinal surface was coated with a thin layer of cement , regardless of whether the cement was light or chemical cured, ie, Type II interface.
In the Posterior composites specimens, the contraction gasps were seen. There was little evidence of resin tag formation in to the dentinal tubules. Type 1, Type II, Type III interfaces were seen although Type II was prominent.
DYRACT- COMPOMER specimens showed Type I and Type II interface although Type I was prominent. The smear layer remained in place apparently infiltrated with resin.

V. Discussion

Many researchers have cautioned against the use of Composite resins in posterior teeth due to the occlusal wear and high incidence of micro leakage due to polymerization shrinkage. Introduction and further development in dentine bonding agents has improved the adhesion of restorative materials to dentine and reduced the micro leakage of Composite restoration. During the past decades, glass ionomers have been used for restorations, luting and fissure sealants, liners, bases and core build-ups (Wilson and Mc Lean 1977)[9]. There are several reasons for their popularity including ease of manipulation, cariostatic properties due to fluoride release, resistance to acid dissolution and better adhesive properties. However, limitations in their applications may result from a low wear resistance, brittleness and relatively low strength.
COMPOMER-DRYACT is manufactured by Dentsply USA. The name ‘COMPOMER’ is derived from COMPosiate and glass ionOMER. The DRYACT – COMPOMER holds promise as an aesthetic restorative materials for Class I and II cavities in deciduous teeth, Class V and cervical abrasion/erosion lesions and Class III cavities. DRYACT – COMPOMER restorative system is a “poly-acid modified composite resin” (Nomenclature proposed by Mc Lean J.W et al 1994)[8] which offers fluoride release, excellent shade matching and aesthetics, superior mechanical properties, limited polymerization shrinkage, making them an exceptional choice for its indicated applications. ‘Prime-Bond’ is a single component visible light-cured enamel and dentine primer, sealer and adhesive which is recommended for use with the DRYACT. DRYACT is available in Compules Tips which provides easy manipulation. Preparation of mechanical retention is not needed and cavity preparation may be kept to a minimum.

A pilot study undertaken to optimize the experimental set up.

The result of the present invitro study shows the highest bond strength for DRYACT – COMPOMER and the least bond strength for conventional glass ionomers. ie, the mean bond strengths in MPa for DRYACT, Fuji II, Fuji II LC, posterior composite were 14.91, 2.6, 8.3 and 10.01 respectively. The results were statistically analyzed using student ‘t’ test and it was observed that DRYACT – COMPOMER has a significantly high bond strength when compared with the other groups. The increased bond strength value in the experimental group (in which DRYACT – COMPOMER was used) can be attributed to the fact that there is a definite and profound bonding of the material to the tooth structure and the superior diametral strength of the material. This results confirmed the findings of R. Triana et al 1994 and Fritz et al 1995. Friedl and Powers 1994[10] reporteed shear bond strength value between 7.3MPa for Fuji II LC whereas for conventional glass ionomer. It was 4.8MPa.
Pawlus M A et al 1995[11] evaluated the shear bond strength value of Resin/Ionomer restorative materials. The mean bond strength of Fuji II LC (6.1 ± 2.4 MPa) were significantly higher than conventional glass ionomer, ketacfil (4.3 ± 2.3 MPa).

Fritz et al[12] obtained a shear bond strength of 12-14 MPa for COMPOMER- DRYACT, 9-13 MPa for Fuji II LC and 2-5 MPa for Conventional glass ionomer. The failure patterns were cohesive type in all the groups. DYRACT and Pekafil (Posterior Composite) showed the highest diametral tensile strength.

In the present study also, bond strength of resin-modified glass ionomer Fuji II LC (8.3 MPa) was superior to those of conventional glass ionomer Fuji II (2.6 MPa). This can be explained as due to the increased diametral strength of the light cured glass ionomer which in turn increases the overall cohesive strength of the material. The bond strength of the resin-modified glass ionomer determined in this study is lower than that of composite resin bonded to dentine with Prisma Universal Bond and it was found to be statistically significant ($P<0.001$). In this study, the radioisotope method was used as the radioisotope could penetrate even to finer details where the dye could not (Roydhouse 1968)[13] . This was supported by Going et al 1960[14] , who states that the ability to detect radioactivity at low levels was much greater the ability by any other clinical substance. The results obtained in this study shows that COMPOMER – DYRACT exhibited the least microleakage and when coupled with enamel etching, it gave almost perfect seal (7 out of 8). This suggests the superior adhesion of DYRACT – COMPOMER. Kerci. J et al 1994[15] , in a pros ective clinical study, by using COMPOMER – DYRACT to restore class II cavities in deciduous teeth, concluded that immediately after placement and after 6 months, there was 92.5% and 95.4% “continuous margins” respectively. Clinical and macro photographical findings were excellent. They concluded that, if this positive results are confirmed by long term data, DYRACT may replace amalgam in deciduous teeth.

In order to explain the differing sealing abilities of materials, it was decided that an investigation of the tooth-restoration interfaces are necessary. Thus in the present study, the nature of the invitro interface between were investigated by Scanning Electron Microscope. In the present study, glass ionomer specimens shows evidence of intracement fractures. It was a consistent finding that the dentinal surface was coated with a thin layer of cement regardless of whether the cement was light cured or chemical cured, ie, a Type II interface, and a few areas suggesting adhesive failure for conventional glass ionomer, ie, Type III interface.With posterior composites, the contraction gap was notably smaller, Type I and II interfaces were noted. The smear layer was retained with no infiltration of resin into the dentinal tubules.In the group with COMPOMER – DYRACT, Type I interfaces predominated. The smear layer is retained and it is preferable, because the dentine bonding agents that remove the smear layer will open the dentine tubules and will lead to an increased dentinal fluid outflow invivo. Even relatively hydrophilic resins resins may then fail to bond under these circumstances.

Although superior bond strength and least micro leakage of COMPOMER –DYRACT restorations are clearly evident from this study, there is a strong need for standardized invivo tests for the identification and quantification of material properites under clinical conditions.

Figures and Tables

Figure – 1

Figure 2

Figure -3

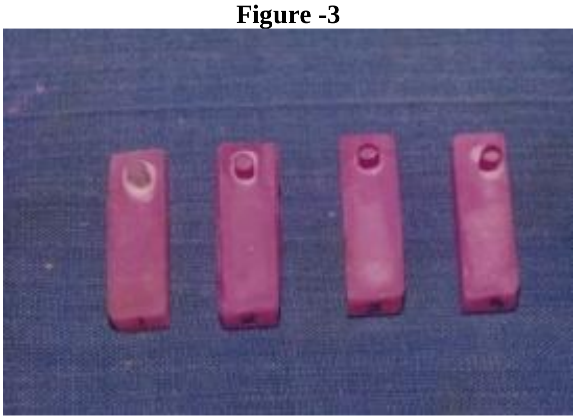


Figure - 4

Figure – 5

Figure - 6

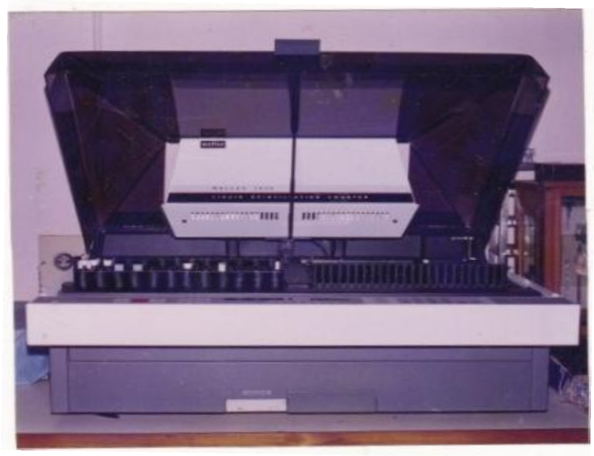


Figure - 7

Legend to Figures
Fig: 1 DYRACT – Light cured Compomer Restorative material
Fig: 2 Fuji II Chemical Cured Glass Ionomer & Fuji II Light cured Glass Ionomer
Fig: 3 TPH – Posterior composite Resin with Primer & Adhesive (Prisma)
Fig: 4 Specimens prepared for bond strength analysis.
Fig: 5 Specimens prepared for estimation of Isotope preparation.
Fig: 6 Fume Hood
Fig: 7 Liquid Scintillation counter

Table 1: Shear Bond Strength of DYRACT-COMPOMER to dentine for Various Sample (group 1)

Specimen No	Breaking load (Kg)	Bondstrength (MPa)
1	23.7	16.32
2	22.9	15.77
3	21.7	14.94
4	20.1	13.84
5	24.4	16.80
6	19.1	13.15
7	23.3	16.05
8	18.0	12.40

Table 2: Shear Bond Strength of Conventional Glass lonomer (Fuji II) to Dentine for Various Samples (Group 2)

Specimen No	Breaking load (Kg)	Bondstrength (MPa)
1	4.5	3.1
2	3.6	2.5
3	3.4	2.3
4	4.4	3.0
5	4.1	2.8
6	3.8	2.6
7	3.4	2.3
8	3.7	2.5

Table 3: Shear Bond Strength of Light Cured Glass Ionomer (Fuji II LC) to Dentine for Various Samples (Group 3)

Specimen No	Breaking load (Kg)	Bondstrength (MPa)
1	12.6	8.7
2	13.4	9.2
3	10.8	7.4
4	11.9	8.2
5	12.7	8.7
6	11.4	7.9
7	10.4	7.2
8	13.1	9.0

Table 4: Shear Bond Strength of Posterior Composite (TPH) to Dentine for various Samples (Group 4)

Specimen No	Breaking load (Kg)	Bondstrength (MPa)
1	16.1	11.1
2	13.9	9.6
3	15.1	10.4
4	14.4	9.9
5	13.8	9.5
6	12.0	8.3
7	15.6	10.7
8	15.4	10.6

Table 5: Mean Shear Bond Strength of Restroative Material to Dentine in the Various Groups

Type of Restorative Materials (Groups)	No. of Samples	Shear Bond Strength		
		Mean	**Range**	**S.D**
1. COMPOMER-DYRACT	8	14.91	12.4-16.8	1.61
2. Conventional Glass-Ionomer	8	2.6	2.3-3.1	0.305
3. Light Cured Glass-Ionomer	8	8.3	7.2-9.2	0.296
4. Posterior Composite	8	10.01	8.3-11.1	1.283

Table 6: Mean Shear Bond Strength Between Various Groups of Sample Size 8:

Type of Restorative Materials (Groups)	't' Value	P Value	Remarks
Groups 1 & 2 (COMPOMER-DYRACT and conventional Glass lonomer	21.28	<0.001	Highly Significant
Groups 1 & 3 (COMPOMER-DYRACT & light cured glass lonomer	10.56	<0.001	Highly Significant
Groups 1&4 (COMPPOMER-DYRACT & Posterior composite	6.73	<0.001	Highly Significant

*Statistical comparison using student's 't' test.

Table 7: Microleakage Scores of Isotope Penetration of the Various Groups:

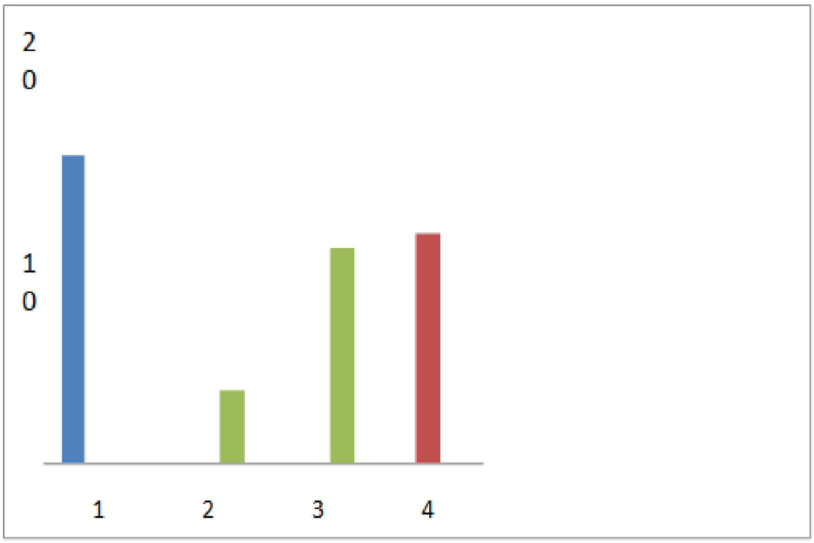
No. of Specimen	Microleakage Score					
	Group 1 Dyract without enamel etching	**Group 2** Dyract with enamel etching	**Group 3** Conventional Glassionomer	**Group 4** Light cured Glassionome r	**Group 5** Posterior Composit e	**Group 6** No Filling
1	1	0	6	3	1	0
2	1	0	6	3	2	0
3	1	0	6	4	2	0
4	0	0	3	1	2	0
5	1	0	3	2	2	0
6	1	0	6	2	2	0
7	2	1	6	2	2	0
8	1	0	4	2	3	0

Table 8: Comparison of Microleakage of the various Groups of samples size **8**

Group 1	T Value*	P Value	Remarks
2 & 1	43.5	<0.05	Significant
2 & 3	36	<0.001	Highly Significant
2 & 4	36.5	<0.001	Highly Significant
2 & 5	36.5	<0.001	Not Significant
2 & 6	64	<0.05	Highly Significant
1 & 3	36	<0.001	Highly Significant
1 & 4	42	<0.01	Highly Significant
1 & 5	43	= 0.01	Highly Significant

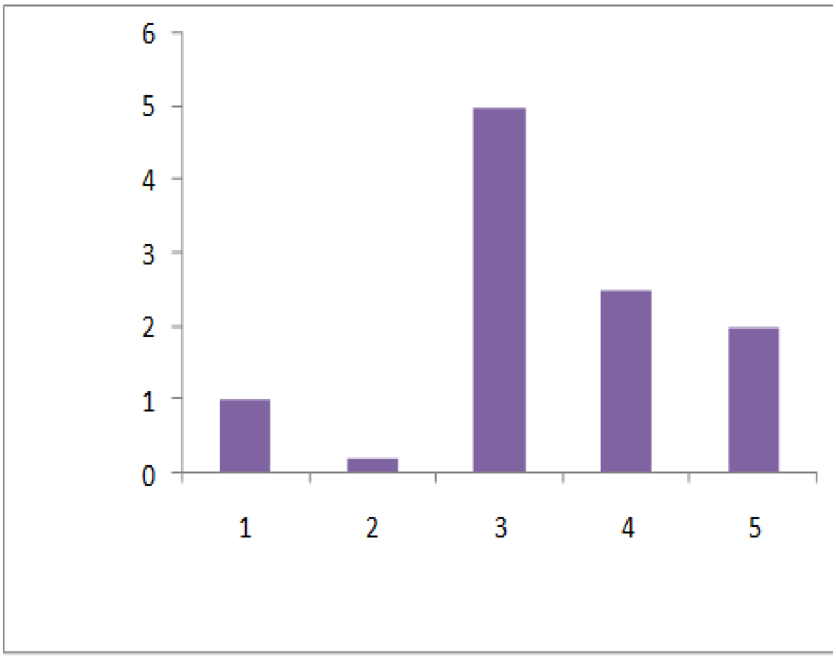
*Sum of the ranks in the experimental group by Wilcoxan's Rank Sum Test.

Fig: 8 Shear Bond Strength of Restorative Materials to Dentine in various groups.



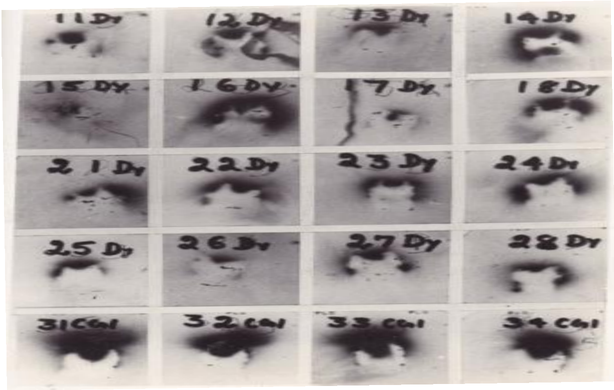
Group 1 - Compomer – Dyract
Group 2 - Conventional glass Ionomer
Group 3 - Light Cured Glass Ionomer
Group 4 - Posterior Composite resin

Fig: 9 Mean Microleakage Scores of Isotope penetration in the various groups.



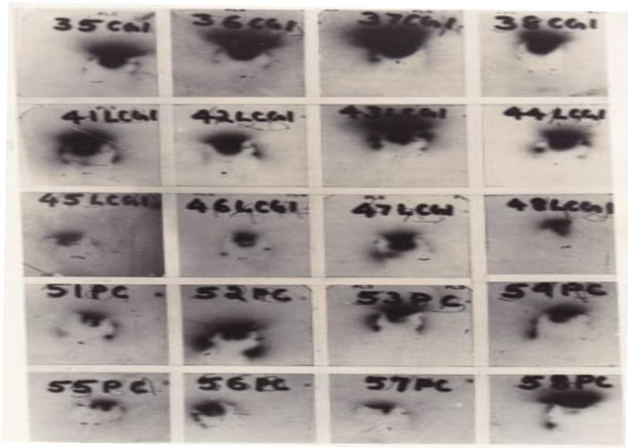
Group 1 - Compomer – Dyract without enamel etching
Group 2 - Compomer – Dyract with enamel etching
Group 3 - Light Cured Glass Ionomer
Group 4 - Posterior Composite resin

Legend to Figure 10
Autoradiographs showing various degrees of isotope penetration:
1st & 2nd Rows (11 – 18) : Group 1 – Dyract Compomer without enamel Etching.
3rd & 4th Rows (21 – 28) : Group 2 - Dyract compomer with enamel etching
5th Row (31 – 34) : Group 3 – Conventional glass ionomer

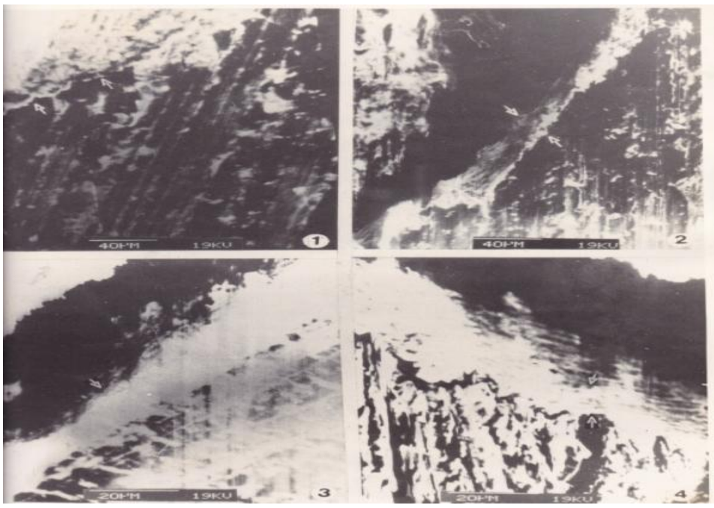


Legend to Figure 11

Autoradiographs showing various degrees of isotope penetration
1st Row (33 – 38) : Group 3 – Conventional glass ionomer.
2nd & 3rd Rows (41 – 48) : Group 4 - Light cured glass ionomer.
4th & 5th Row (31 – 34) : Group 5 – Posterior composite resin



Legend to figure 12
Scanning electron microscopic picture of tooth – restorative material interface.
1. Compomer Dyract Showing resin – dentine interdiffusion zone (100 X).
2. Conventional glass ionomer showing ion – exchange zone (100 X).
3. Light cure glass ionomer showing ion – exchange zone (200 X).
4. Posterior composite resin showing resin – dentine interdiffusion zone (200 X)



VI. Conclusion

The results of the present study can be summarized as follows:-

- COMPOMER-DRYACT showed the highest shear bond strength (mean 14.19 MP a)
- Shear bond strength of COMPOMER – DYRACT was significantly higher than conventional and light cured glass ionomers and posterior composite.
- COMPOMER –DYRACT showed the least micro leakage at the tooth restoration interface and it was significantly lower than those of glass ionomers and composite. COMPOMER –DYRACT coupled with enamel etching produced a perfect seal.
- Scanning Electron Microscopy Showed a Type I interface (ie, complete contact between restoration and dentine) in COMPOMER –DYRACT restorations. The ‘ resin inter-diffusion zone’ was seen between the tooth and material. There was a definite gap in glass ionomer specimens, with Type II failure (ie, Cohesive failure leaving the dentine surface coated with bonding material ion rich layer’). In posterior composite specimen both Type I & II interfaces were noted and resin interdiffusion zone was seen.

The present investigation lead to the conclusion that COMPOMER –DYRACT can be considered superior to glass ionomer and characteristics offered by COMPOMER –DYRACT, it has beneficial properties of both glass ionomer and composite resins, like fluoride release and better aesthetics. Although it is clearly evident from the study that COMPOMER –DYRACT could be a possible ideal substitute for glass ionomer and composite resins, there is a strong need for standardized invivo tests for the identification and quantification of material properties under clinical conditions. Then only we can arrive at a definite conclusion about the success of COMPOMER –DYRACT restorations in a clinical situation.

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