



AMALGAM OR COMPOSITE? WHICH IS WIDELY PRACTICED AND WHY? - A SURVEY.

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ABSTRACT

Aim: To find out the most commonly used material in clinical practice among composite and amalgam and also to find out the reason behind it.

Materials and methods: A set of questions was prepared giving equal importance to both amalgam and composite. It also includes various aspects of material such as manipulation, toxicity, success rate, patients knowledge and wish etc. A question was also made to give dentists opinion on various dental materials and was finally asked to pick one among two material (amalgam or composite). Questionnaire was distributed among 50 clinics in chennai and its outer area. The questionnaire filled by the doctors were collected and assessed.

Results: It was found composite is practiced 8 times more frequently than amalgam. The reason being esthetics that makes huge influence in composite as a material to practice frequently and mercury toxicity being a huge influence in reduction in practice of amalgam.

Conclusion: Though amalgam having high strength and life span than composite as a restorative material, a material that when given as restoration is exact tooth like and contributing to esthetics makes composite as best material of choice in clinical practice.

KEYWORDS : amalgam, composite, best material, miracle mix.

1.INTRODUCTION:

With ADA specification number no1, this amalgam is a combination of various alloy metals which is mixed with the mercury to give a filling to the tooth[1]. Dental amalgam first appears in the Tang Dynasty medical text Hsin Hsiu Pen Tsao written by Su Kung in 659, which was manufactured from tin and silver. It was during the Ming Dynasty that the composition of an early dental amalgam was first published, and a text written by Liu Wen Taiin 1505 states that it consists of "100 shares of mercury, 45 shares of silver and 900 shares of tin." [2] Amalgam is in a state of debate more than two centuries. American society of dental surgeons (ASDS) in 19 century forced its members to pledge on discontinuing amalgam from practice due its toxicity. This was the cradle of what is called as first dental amalgam war [3]. But in 1859 American dental association (ADA) defended ASDS and strongly recommended the practice of amalgam [4].

Amalgam has a mixture of alloy powder which consists of silver, copper, zinc, tin etc and mercury as its liquid component. The powder and liquid are triturated to form a condensable material called as amalgam which sets to be strong material. This amalgam requires a specific technique rules which has to be followed in preparing the tooth for filling. It not only involves excavation of caries but also requires certain amount of width of $\frac{1}{4}$ the intercuspal distance and height of 1.5mm to 2mm, with a special outline form, cavosurface margin, occlusal convergence, flat pulpal floor, rounded line angles etc for its retention as well as resistance form for the restoration so that it doesn't break or comes out of the cavity prepared when forces are applied. The main advantage of amalgam restoration are its strength [5]when properly placed and it success for a very long year[6]. Some claim the mercury also to be bacteriostatic[7], but still it is of controversy. Amalgam have few disadvantages and they include mercury toxicity, discoloration of tooth, skill for dentist, proper carving and burnishing etc.

Composite on the other hand is the esthetic material that has shown success as a anterior as well as a posterior restorative material. Composite resins are most commonly composed of Bis-GMA and other dimethacrylate monomers (TEGMA, UDMA, HDDMA), a filler material such as silica and in most current applications, a photoinitiator. Dimethylglyoxime is

also commonly added to achieve certain physical properties such as flowability. Composites which are under practice have less polymerization shrinkage. Most of the composites now practiced are light curable composites. Initially UV lights where used but had a disadvantage of inability to cure in depth. Later various curing units came into practice and most commonly used in LED light curing units[8].

The composite restoration involves few procedures which has to be carried out for a better restoration. It include acid etching and application of bonding agent. Acid etching is performed using 37% phosphoric acid. Which is then rinsed dried and bonding agent is applied and cured. This is followed by application of composite material and curing it to be a permanent restoration. The most interesting of all is different shade scales that is available by this composite material so that exact replica of the tooth is provided. Advantage include esthetics, less systemic toxicity, conservative cavity is sufficient, time consuming. Disadvantages include polymerization shrinkage, postoperative sensitivity, less strength compared to amalgam etc.

2.The questionnaire:

The questionnaire consists of 35 questions. The questions were on both amalgam and composite. It included knowledge of patient on this material, their use in clinic, cavity preparation, carving, trituration, types of material used, questions on both advantages and disadvantages of both the materials etc. A question was also included on the use of miracle mix. Influence of their cost was also analyzed. Finally a question on amalgam to return in practice, best material according to them, the restorative materials they practice, an option to pick among amalgam and composite and few lines for suggestion where also provided.

3.DISCUSSION:

When looking into the knowledge of patients on these materials it was found that patient was more aware of composite than amalgam restoration. Only 20% of patients have knowledge on amalgam restoration whereas on composite restorations it is 60%. It might be because most clinicians commonly use composite restorations than amalgam restorations. It was curious to know that only one in ten clinicians practice amalgam restoration frequently.

Whereas for composite it was astonishing that eight in ten clinicians practice composite frequently. The most unbelievable was amalgam in practice has taken another appearance in form of miracle mix. Four in ten persons practice miracle mix. Finding the reason for the huge difference between amalgam and composite practice analysis where made under different categories.

When question on difficulty in amalgam cavity preparation, applying a base, trituration and amalgam carving, burnishing was asked they neither found them easy nor difficult. When same was done with composite regarding its preparation, using etchant, bonding agents self adhesives etc they found it a bit easy to use composites. Thus on comparing amalgam and composite based on preparation application and manipulation etc it was a very bit that is only 10% difference in difficulty level. Though amalgam preparation is a bit tougher one compared to composite it didn't make an influence on the material and its practice in clinical scenario as its only 10%.

With regards to the question made on mercury toxicity 80% of the clinicians were afraid of it. It played a very important role in deciding between composite and amalgam. When asked verbally about this mercury toxicity, many in Chennai and its periphery have clinics which are air conditioned. They are very much afraid of mercury vapors as they have a closed environment. This might be a very important character of this amalgam to be used less in practice. Mercury toxicity is something which has to be feared.

When question about tarnish and corrosion about amalgam was asked 70% of clinicians are worried about and patients come with tarnish and corrosion frequently. Similarly about galvanization was asked they 68% of them said it is a drawback and the main disadvantage as they couldn't give dissimilar metals. On the same hand regarding question on postoperative sensitivity with composite 54% of the clinicians reported it as drawback for composite as restoration.

In comparing with failure of composite and amalgam restoration the clinicians reported both had an equal number of failure rate. Some said it to be an improper skill in case of amalgam and some said the life expectancy of composite itself is very less and maximum it might reach an average of 3-4 years. So failures are equally common in both amalgam and composite. So it didn't have a significant difference in the practice of these materials.

Coming into to esthetic part of the material 64% clinicians say that amalgam's esthetic is a drawback for material. Whereas 80% of them say esthetic with the composite is the most advantage with that of composite restoration. When a restoration which is tooth like pits composite at heights. At the same time 70% of the clinicians say strength of amalgam as a unique property for amalgam restorations. Though they are bad with esthetics their strength is their unique property. When prepared and placed properly they come for around 25 years on an average. Whereas composite clinicians say it is only 58% stronger. So esthetics makes composite a material of choice and strength with that of amalgam.

Considering cost as a factor influencing restoration 68% of clinician said composite has influence with cost. It was astonishing when a dentist said the material cost and the number of restoration we do with that of composite is profitable than that of amalgam and other restorative materials.

When a yes or no question was raised, whether amalgam to return to practice 9 in 50 said they should come back to practice. When a direct question was asked to pick one among

amalgam or composite 48 of 50 clinicians chose composite.

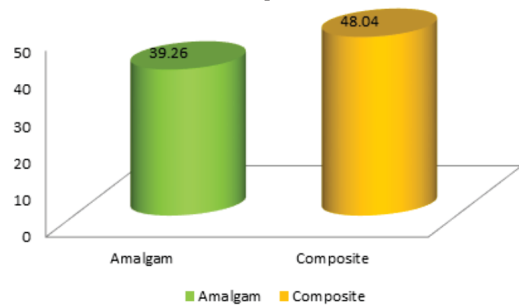
The clinicians were also asked say the best material according to them. It was unbelievable that posterior GIC, gold was also a part of the best materials. Out of 50, 30 of them said composite is the best material, 17 of them said Posterior GIC, 2 of them said amalgam and one said gold. Everyone practiced composite and GIC but only very few practice amalgam. When question on suggestions and any other opinion on restorative material asked two of them said ban amalgam. They said it is in india we follow amalgam. Many countries have banned it. Some of them said light cure GIC is better and some came with suggestion to produce cost less composite.

4. CONCLUSION

Esthetics is all about restorative dentistry in modern world. Esthetic materials are one which patients wish to have. A restoration when had in such a way that it makes no difference between their natural teeth and becomes undetectable by a common man makes composite a best material of choice as a restoration. Amalgam on the other hand has very good strength and very good life. But esthetics which is a concern for patients and mercury toxicity which is a very big concern for clinicians made this wonderful material almost extinct from practice. Many material come and go gold is considered the best, like wise amalgam is the best. When comes to esthetics and current world scenario composite is the best. Amalgam can be said a dominant material of 20th century. Whereas it is composite for 21st century. Amalgam can't replace composite or composite replace amalgam. Each one has an ideal property.

	Mean	Std. Deviation	t-value	Mean Difference	P-Value
Amalgam	39.26	5.584	49.719	8.78	0.0001*
Composite	48.04	8.109	41.892		

95% Confidence Interval of the p=0.05



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