

The evaluation of amalgam and composite restorations in Mosul private clinics

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ABSTRACT

The aim of this study was to evaluate amalgam and composite resin restorations work in private practice in Mosul City. A list of dentist practicing in private clinics was obtained from the Iraqi Dental Association in Mosul City.

One hundred sixty dentists involved in the questionnaire were selected randomly from a total of 200 dentists in the list supplied. The questionnaire concerned with the step-by-step restorative treatment including diagnosis and case selection, cavity preparation, types of liners and bases used, amalgam restoration and direct esthetic restorations.

The results revealed that 100% of the respondents perform restorative dental therapy in their private clinics. The results also revealed an evaluation (as percentage) for most of steps concerned with direct restorative techniques.

Key Words: Evaluation, restorations, amalgam, composite resin.

الخلاصة

الهدف من هذه الدراسة هو تقييم عمل حشوات الأسنان من الأملغم والراتنج الأكريلي في العيادات الخاصة في مدينة الموصل. تم الحصول على قائمة بأسماء أطباء الأسنان الذين لديهم عيادات خاصة في مدينة الموصل من نقابة أطباء الأسنان العراقية فرع الموصل.

تم اختيار ١٦٠ طبيب أسنان بصورة عشوائية من القائمة من مجموع ٢٠٠ طبيب أسنان لمليء استمارة الاستبيان الخاصة بهذه الدراسة. اهتمت هذه الدراسة بكل خطوات حشوات الأسنان متضمنة التشخيص واختيار الحالة، تحضير الأسنان، أنواع الطلاءات والقواعد المستعملة تحت الحشوات، حشوات الأملغم والحشوات التجميلية المباشرة.

أوضحت النتائج أن ١٠٠% من أطباء الأسنان الذين تم اختيارهم ينجزون حشوات الأسنان في عياداتهم الخاصة؛ كما أظهرت النتائج تقييماً لمعظم خطوات عمل حشوات الأسنان المباشرة وبشكل نسب مئوية.

INTRODUCTION

Operative dentistry is the art and science of the diagnosis, treatment and prognosis of defects of teeth which do not require full coverage restorations. Such treatment should result in the restoration of proper tooth form, function and esthetics while maintaining the physiological integrity of the teeth in harmonious relationship with the adjacent hard and soft tissues. Operative dentistry has been recognized as the foundation of dentistry and the base from which most other aspects of dentistry evolved.⁽¹⁾

Operative dentistry today continues to be a most active component of most dental

practices. Moreover, epidemiological studies project that demand for operative dentistry will not decrease in the foreseeable future.⁽²⁾

The aim of this study was to evaluate the amalgam and composite resin restorations work practiced in private clinics in Mosul City.

MATERIALS AND METHODS

A list of dentists practicing in private clinics was obtained from the Iraqi Dental Association in Mosul City. One hundred sixty dentists were selected randomly from a total of 200 dentists in the list supplied.

The questionnaires contained a total of 23 questions concerned with the restorative work practiced in their private clinics. The questions concerned with the step-by-step restorative treatment including diagnosis and case selection, isolation, cavity preparation, types of liners and bases used, amalgam restorations and direct esthetic restorations.

The data were collected and the percentage of each variable was calculated.

RESULTS AND DISCUSSION

The high response rate to this survey (80%) indicates that data are likely to be reliable and representative of the practicing dentists in Mosul City.

The results revealed that 100% of the respondents perform direct restorations work in their private clinics.

When the respondents asked about the administration of a local anesthesia during cavity preparation, it was found that 58% of them always perform cavity preparation under local anesthesia, 8% did not give local anesthesia at all and 34% were occasionally give anesthesia. Anesthesia usually is essential for providing patient comfort, reducing saliva flow and promoting good patient cooperation during the procedure.⁽¹⁾

Radiographs are essential aids in diagnosis.⁽³⁾ When the respondents asked about a diagnostic radiograph, it was found that 90% take a diagnostic radiograph for questionable cases, and 10% did

not take a diagnostic radiograph at all.

Initial cavity preparation was performed using carbide bur (18%), diamond instrument (52%) and 30% of the respondents used both types. Carbide burs are better for end cutting, produce lower heat, and have more blade edges per diameter for cutting. They are effectively used for punch cuts to enter tooth structure, intracoronary tooth preparation, amalgam removal, small preparations and secondary dentin features. Diamonds are more effective for both intracoronary and extracoronary tooth preparation, beveling enamel margins on tooth preparations and enameloplasty.⁽⁴⁾

Deep caries excavation was found to be performed by round bur at low speed (40%), using spoon excavator (23%) and 37% of the respondents were used both techniques. Effective caries removal can be accomplished with hand instrumentation using spoon excavators, or a slow-speed handpiece with a large round bur. The use of spoon excavators may result in peeling off amounts of softened dentin layer than intended and therefore result in inadvertent pulp exposure. Thus, hand excavation requires great skill and sharp instruments. Rotary instruments provide good control and require less skill.⁽⁵⁾

When the respondents asked about the temporary restoration, it was found that 8% were restoring the cavity with a temporary restoration for all cases, 83% for questionable cases, and 9% were not used temporary restoration at all (Figure 1).

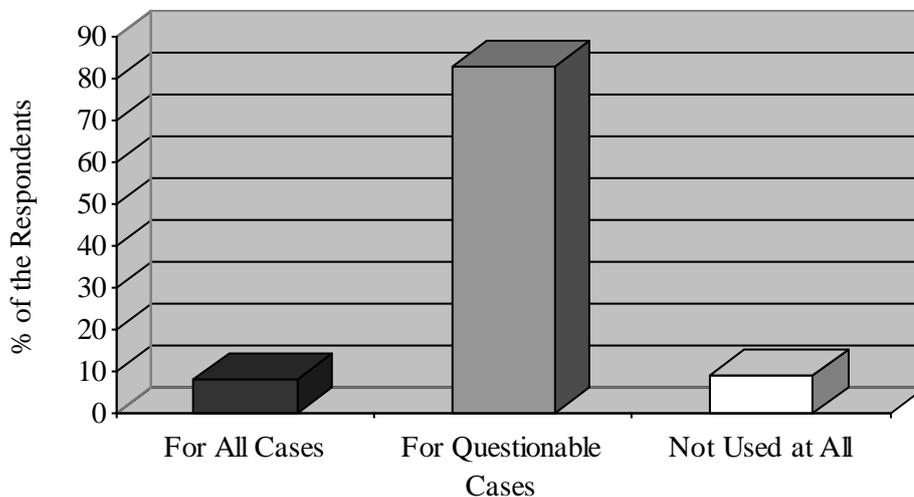


Figure (1): The use of temporary restoration

Cavity varnish was found to be used always under amalgam restorations by only 10% of the respondents, 76% were not and 14% were occasionally used cavity varnish under restoration. Varnish is used primarily to provide a barrier to protect the dentin from residual reactants diffusing out of a restoration and/or oral fluids that may penetrate leaky tooth-restoration interfaces. It also contributes initial electrical insulation, and generate some thermal protection. However, because of the use of dentin and amalgam bonding systems, the use of varnishes has decreased considerably in the late 1990s.⁽¹⁾

Calcium hydroxide liner was found to be used for all cases by 9% of the respondents, while 88% were used Ca(OH)_2 for deep cases only, and 3% of the respondents were not use it at all. In the deepest portions of the preparation or

when a microscopic pulp exposure is suspected, it is more important to encourage dentinal bridging by using calcium hydroxide compositions.^(6,7)

The use of a cement base under amalgam restoration was estimated. It was found that 65% of the respondents were using cement base, while 35% were not (Figure 2). For those who used cement base under amalgam restoration, it was found that the preferable types were zinc phosphate (42%), zinc polycarboxylate (33%), glass ionomer (17%) and re-inforced zinc oxide eugenol cement (8%). In operative dentistry, the main reason for placing a cavity lining or a base is to prevent damage to the pulp from bacterial leakage around restorations. Former reasons such as material irritancy or thermal protection have been severely criticized.^(8,9)

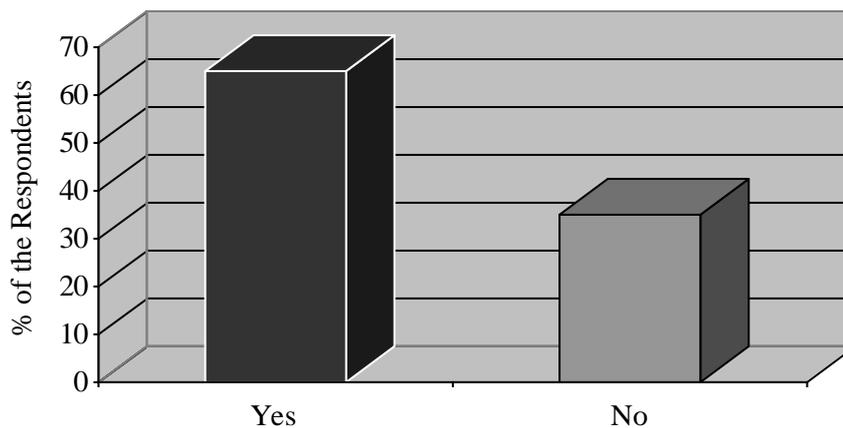


Figure (2): The application of cement base under amalgam restoration

The preferable type of matrix retainers used for class II restoration were found to be Ivory No. 8 (63% of the respondents), and Ivory No. 1 (37% of the respondents).

Concerning the type of wedge used, it was found that 79% of the respondents prefer wooden wedges, and 21% prefer plastic.

When the respondents asked about the amalgam used, it was found that 20% were using amalgam capsules, 42% were using amalgam powder, and 38% were using both types (Figure 3). According to dental mercury hygiene recommendations,

only precapsulated alloys should be used, and discontinue the use of bulk mercury and bulk alloy.⁽¹⁾

Mixing of amalgam was found to be performed by amalgamator (63% of the respondents) and by pistol and mortar (37% of the respondents) (Figure 4). According to the dental mercury hygiene recommendations, the use of an amalgamator with a completely enclosed arm is preferable.⁽¹⁾

Checking of high spot of amalgam restoration was performed by the use of articulating paper (31%), asking the patient (22%), examination of a shiny spot

(33%), and 14% of the respondents were using all the above methods.

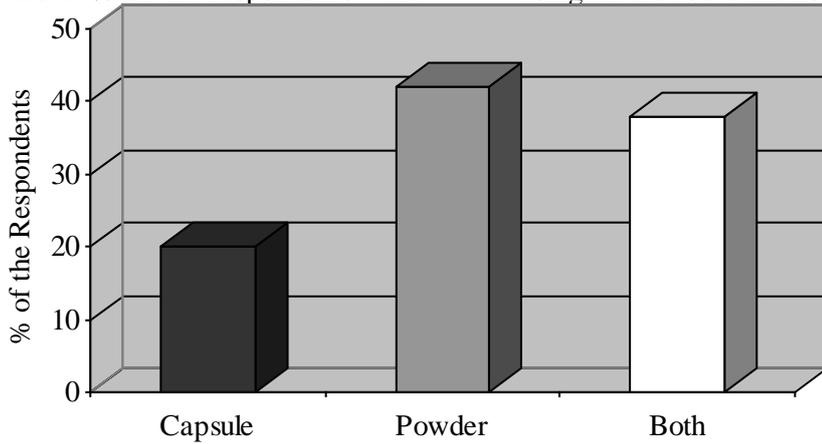


Figure (3): Types of amalgam used by the respondents

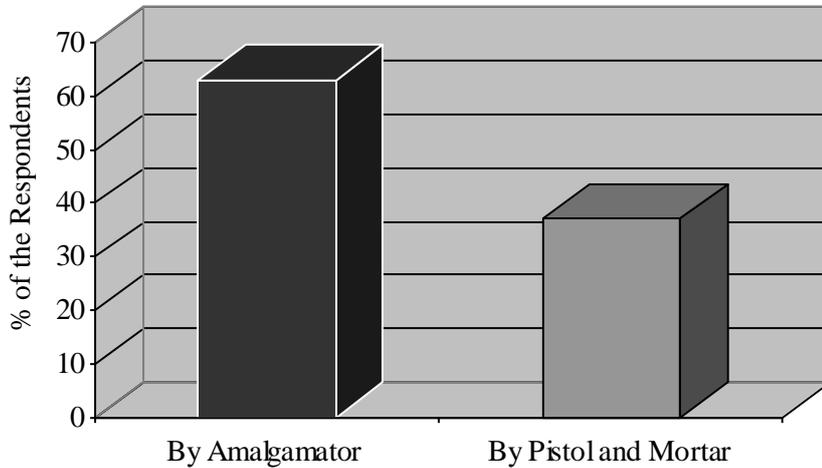


Figure (4): Methods of mixing of amalgam

Forty percent of the respondents were always recalling the patient for polishing of amalgam restoration, 8% occasionally recalling patients, and 52% were not. An amalgam restoration is less prone to tarnish and corrosion if a smooth homogeneous surface is achieved.⁽¹⁰⁾

Direct esthetic restorations were found to be practiced by all of the respondents. Sixty seven percent were used light cured composite, 25% used chemical cured, 5% used compoglass, and 3% used glass ionomer restoration (Figure 5). Composites are presently the most popular tooth coloured materials, and the light-cured type is superior than the self-cured material.⁽¹⁾ Glass ionomers may be good materials for restoration of root-surface caries because of their inherent potential

anticariogenic quality and adhesion to den-tin.^(11, 12) Compoglass may be best indicated for Class V restorations in adults who are at high risk for caries and for Classes I and II restorations in primary teeth that will not require long-term service.⁽¹³⁾

The results also revealed that 67% of the respondents have a light cure unit in their private clinics, and 33% have not.

Pulp protection used under composite resin restoration was found to be calcium hydroxide (89% of the respondents), glass ionomer cement (3%), and 8% were using only bonding agent. Calcium hydroxide is primarily indicated for deep caries excavation or when pulpal exposure exists. Glass ionomer cements are preferred when greater strength or anticariogenicity is advised.

able.⁽¹¹⁾

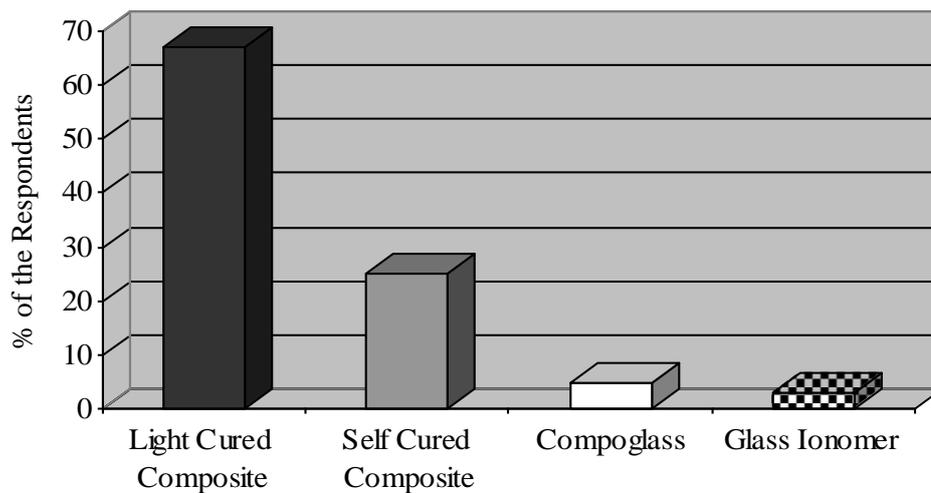


Figure (5): Types of direct esthetic restorations preferred by the respondents

Regarding etching and bonding, 68% of the respondents were using separated bottles, and 32% were using one bottle system.

Finally, when the respondents asked about the method of insertion of composite resin material, 76% were preferring the incremental technique, whereas 24% were using the bulk technique. In fact the incremental technique is much more better than the bulk technique because with the incremental technique there is insurance of complete polymerization of each increment of composite material. Also, the net effect of polymerization shrinkage can be reduced by incremental addition of a photo-initiated material to the tooth and polymerization of each increment independently. The smaller the individual segments, the less the overall shrinkage.⁽¹⁴⁾

CONCLUSIONS

One hundred percent of the respondents perform direct restoration work in their private clinics.

A successful amalgam restoration is still relatively easy to accomplish.

Composite restorations are more difficult and technique sensitive to operator ability than amalgam restoration.

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