

# An Evaluation of Proximal Caries Managements among Practitioners in Mosul City.

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## ABSTRACT

**Aims:** To evaluate the diagnostic methods, preparation techniques and restorative materials used by dentists in Mosul City for the management of proximal carious lesions. **Materials and Methods:** A questionnaire sheet with numerous items were distributed randomly among 150 dentists (specialists and non-specialists) working in Mosul City. The sheets were collected and the data were analyzed. **Results:** The results revealed that there are several differences in performing specific steps of proximal caries diagnosis and the treatment among the dentists involved. **Conclusions:** The conclusions of this study indicated that the variations among dental practitioners in managing proximal caries refer to the role of the continuing dental education. Dentists are in need to be in contact through meetings, lectures and training courses with the recent and up-to-date advancement in dentistry. **Key words:** Proximal caries, dental decision.

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## INTRODUCTION

Caries is nowadays understood to be a dynamic process episodes of demineralization and remineralization occur over various periods of time. Operative intervention indicated only when there is macroscopic break down of teeth structure; i.e., when a cavity has formed<sup>(1)</sup>. The majority of dental practitioners need to spend much of their time deciding whether lesions of caries are present or not and to make a judgment on how to treat such lesions<sup>(2)</sup>.

Diagnosis of proximal lesions are difficult, because of the restricted access to the examination. Clinicians need several methods of diagnosis to investigate these surfaces<sup>(3)</sup>.

Cavity preparation for such caries has been based on G.V. Black's principles which require an occlusal involvement. The current equipments and restorative materials permit more conservative geometric forms, also the reduction in bur dimension has allowed a minimal removal of tooth structure<sup>(1)</sup>.

Materials used for restoration of caries lesion include amalgam, composite resin, glass ionomer, porcelain and gold. Composite resin match the color of pa-

tient's natural teeth and thus used more frequently when esthetic care was concerned<sup>(4)</sup>.

The variation in decision making about management of caries have been demonstrated among dentists in several countries. Such studies need to assess the restorative treatment philosophies<sup>(4-7)</sup>.

The aims of this study were mapping the diagnostic methods, preparation techniques and restorative materials that dentists in Mosul City are used, for management of proximal caries lesions.

## MATERIALS AND METHODS

For the present study, a questionnaire sheet that concerned with different methods of proximal caries diagnosis and management were prepared and delivered among 150 dentists. They were selected randomly from different centers in Mosul City (Health Centers and Dentistry College). The dentists involved in the study were both specialists and non specialists.

The questionnaire sheet did not contain the name of the dentist who filled it. The sheets were collected from the respondents and subjected to analysis, arrangement and tabulation.

## RESULTS

From the total number of dentists involved in the study, 48% of them male others are females. Regarding to the specialty, 68% were specialists and 32% were not. The average number of teeth treated per week ranged from 5 teeth to 25 teeth. The largest number of dentists treated 10 teeth/ week, Table (1). Most of dentists who treated 20 teeth and over per week were specialists in Conservative Dentistry.

When the respondents were asked about using radiograph as a method of caries diagnosis in the proximal surfaces, 96% of the respondent out of (144 dentist) replied that they used this technique for diagnosis, and 47% of them preferred bitewing radiograph ,while 53% preferred using bisecting angle technique, Table (2).

Visual and tactile examination were chosen by all respondents as another means usually depending on diagnosis.

Only 4% (6 dentist) preferred Fiber Optic Trans-Illumination (FOTI) as a method of a proximal lesions diagnosis, that revealed with Table (3).

Cariou lesion confined to the enamel had been restored by 24% of the dentists, while 40% waited until the lesion was

progressed into dentin, 18% treated the carious lesion when radiolucency is present in x-ray radiograph.

The remaining 8% treated lesion only when the cavitation occurred in the tooth.

The percentage of dentists treated the proximal lesion with restoration using a combination of dentine caries and radiolucency was 20%, Table (4).

When the respondents were asked about the preferable proximal cavity design, the traditional CI II cavity preparation was the design of choice by 114 dentists (76%), 18 dentists (12%) preferred box preparation although not all of them used adhesive for such design, 12 dentists (8%) used tunnel preparation, and only 6 dentists 4% preferred the saucer design, Figure (1).

A variety of materials are available for restoring the prepared cavities, the most commonly used are amalgam and composite resin material. In this study, amalgam was preferred over a composite in the opinion of 144 (96%) respondents, while only 6 (4%) preferred composite and no one used glass Ionomer cement, as shown in Figure (2).

Table (1): Average number of carious teeth treated per week by the dentists.

Number of dentists	tooth/ week
24	5
24	6
6	7
6	8
42	10
12	15
30	20
6	25

Table (2): Radiographs used for diagnosis of proximal caries.

Use of radiograph	Type of radiograph	Percentage
Yes	96% Bisecting angle technique	53%
	Bit-wing	47%
No	4% —	—

Table (3): Percentage of diagnostic methods used by the dentists.

Diagnostic method	Percentage
Visual and tactile	100%
Radiograph	96%
FOTI	4%
Others	0%

Table (4): Percentage of dentists according to the level of treatment caries.

Level of caries	Percentage of dentists
Lesion on enamel	24%
Dentin lesion	40%
Radiographical caries	8%
Dentin lesion + radioluceny	20%
Cavitation	8%

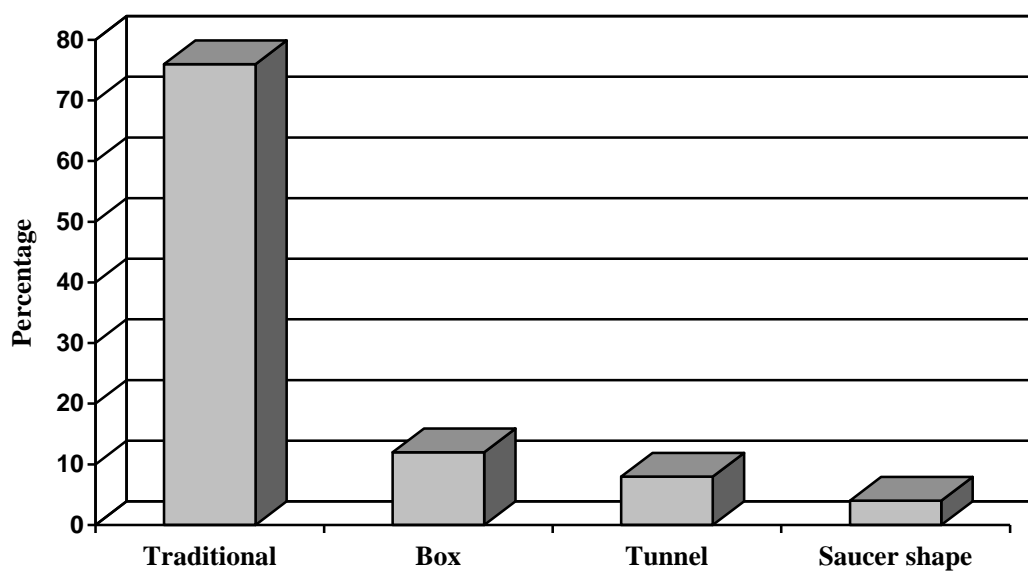


Figure (1): Percentage of four different cavity design.

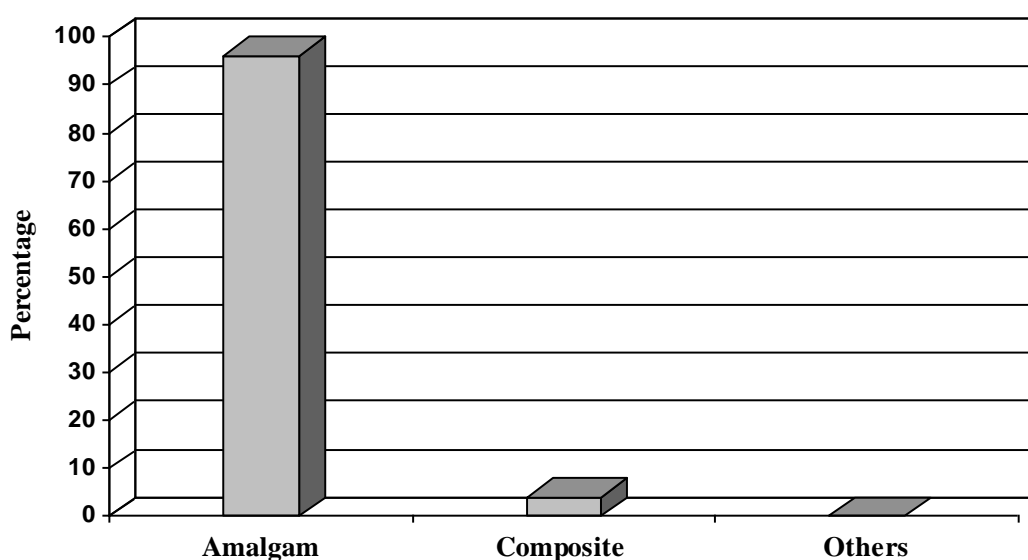


Figure (2): The types of restorative material used.

## DISCUSSION

A random sample of dentists in Mosul City were asked about the diagnosis and treatment of proximal caries, which type of cavity preparation and filling material they would prefer.

The result of this survey may be considered to represent a fair summary of current practices in Mosul City, and this may help in encouraging "Dental Faculties" to develop a consensus on issues related to diagnosis and management of dental caries.

Several studies revealed a variation in decision making about the restorative treatment that have been demonstrated among dentists in several countries<sup>(4-8)</sup>.

This study assessed the restorative treatment philosophies based on the representative sample of Mosul dentists.

The dentists need to modify their operative treatment practices in the light of modern philosophies. Black's cavity preparation principles have long guided dentists restorative strategies, but in recent years, better understanding of caries process has changed the operative treatment philosophies now. Preventive strategies involving fluoride and enhance the remineralization are preferred, operative treatments are however undesirable unless the carious lesion has reached an advanced stage of cavitation<sup>(9)</sup>.

For individual treatment planning, caries in the proximal surfaces have traditionally been diagnosed by clinical examination combined with radiography<sup>(10)</sup>, and these methods are still employed frequently among dentists. For this reason, high percentage of respondents use radiographs for diagnosis of proximal lesions. The radiograph is considered to be the most common adjunct to the visual and tactile clinical examination.

Practically, clinical examination must precede the radiographic examination in an individual treatment planning and selective radiography should be performed in cases in which a clinical examination has lead to a suspected lesion<sup>(10)</sup>.

Other methods of diagnosis like Fiber Optic Trans-Illumination (FOTI) used by very low percentage of dentists, cannot be used as a method of choice for identification of proximal surface of permanent

teeth. The low sensitivity value of this methods may be due to that, with FOTI examination; we considered a shadow seen in the dentine as a sign of cavitation, and the majority of shadows reported were assessed to be confined to enamel only<sup>(10)</sup>.

The study showed a considerable variability in the responses with regard to the rate of proximal lesion progress from outer enamel to dentine, less than half of respondents decided to restore the proximal lesions, when caries reach to dentine (the higher percentage were in among the specialists). The treatment of lesion when it is confined to enamel was the answer of 1/4 of respondents.

Similar survey on Swedish, indicated that 1/3 of dentists did not treat the lesion in enamel<sup>(6)</sup>. In Norway, 81% of dentists waited until the lesions reached dentine<sup>(7)</sup>.

Eighty eight percent of French practitioners would have prepared the proximal lesion when reached amelodentinal junction<sup>(4)</sup>.

While, in Scotland, many dentists would fill an proximal lesion, when radiolucency was confined to enamel<sup>(11)</sup>.

A survey on the beliefs and attitudes of French University teachers in operative dentistry illustrated a wide disparity among them, particularly concerning the restorative treatment threshold of proximal surfaces, only 39.1% of respondents would have waited until the lesion was in dentine, carious lesions confined to enamel would have been operatively restored by 21.9 % of the respondents<sup>(12)</sup>.

An over estimation of the speed at which dental caries progress through the enamel, and lack of good knowledge about the opportunities for the remineralization of enamel lesions with fluorides are largely affected by the tendency to restore carious lesion. For example, dentists who knew about the slow progression of lesion delayed the surgical treatment of it until the caries penetrates the dentin.

The percentage of proximal lesions that progressed from enamel into dentine was calculated by Brabner *et al.*, for individual subject to a low fluoride exposure, between 50 and 60 percent of enamel lesion progress into dentin over a period of three to four years<sup>(13)</sup>.

Mejare *et al.* determined that 75 % of lesions in enamel did not progress into the dentin in group of adolescents over a period of 4.8 years<sup>(14)</sup>.

It can be hypothesized that these differences among the dentist opinions illustrated their understanding of the carious process and his/ her level of confidence about the remineralization.

In this study, high percentage of respondents (76%) used traditional CI II cavity preparation, this finding suggested that many dentists have not modified their operative treatment practices in the light of modern philosophies. This may related to the high cost of newly introduced materials and their equipments that dentists need it to improve and develop their work.

Gorucu *et al.* suggested that it may be unnecessary to extend CI II preparations across the occlusal non carious grooves , sealing the non carious fissures more conservative than included in the preparations<sup>(3)</sup>.

The practitioner in Mosul City mainly used amalgam restoration for traditional CI II preparation, while the majority of French dentists preferred composite materials<sup>(4)</sup>. In Norway, fifth of the dentists choose amalgam and others used different types of color restorative materials<sup>(7)</sup>.

In California, non amalgam materials are significantly popular among dentists<sup>(15)</sup>. Clinical evaluation of posterior composite material concluded that with the improvement in materials, careful case selection and application of restorative technique, posterior composite can placed under appropriate conditions and monitored routinely can be expected to last 10 years or longer<sup>(16)</sup>.

The high cost and demanded operative technique remained the main criticisms with amalgam alternatives.

Addition of an adhesive system improved fracture value for different types of preparation<sup>(3)</sup>. The effectiveness of adhesive agents used in proximal lesions, studied by numbers of investigators, the results demonstrated that the preparations with the adhesive systems indicated a higher resistance to dislodging load than the preparations without adhesive<sup>(3, 17)</sup>.

The results of this study support the

need for continuing education programs in management of dental caries, because the goal of conservative management is to preserve as much of the existing tooth structure as possible.

## CONCLUSIONS

Large numbers of dentists (mainly the specialist) updating their knowledge and beliefs about management of proximal dental caries, while others do not diagnose or treat such lesions correctly.

These variations have important implication for continuing dental education. Dentist need to be in contact with the most recent advancement in dentistry fields. This could lead to the consistent and modern management of the carious process, which could be advantageous to the patients.

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