

## CLINICAL STUDY TO IMPACT THE NUMBER OF AMALGAM FILLINGS IN ORAL CAVITY TO FORM ORAL LICHENOID LESIONS IN SYRIA

Rabab kraidi<sup>1</sup>, Mahmoud Abdul-Hak<sup>2</sup>, Samira zraiki<sup>3</sup>

1.PG student

2.PHD

3.PHD

### ABSTRACT:

**Aim:** This study aimed to evaluate relationship between allergic reactions and the number of amalgam restorative which contains mercury in oral cavity .

**Materials & Methods:** The findings of 990 patients with dental restorative materials were analyzed retrospectively clinically without any histopathological information , 573 ( 57.9% ) male 417 (42.1 %) female with amalgam fillings (35 women and 85 men; age range: 21-67 years) had oral lichenoid lesions OLL in contact with amalgam fillings . Clinically, 3 patient groups were identified: (1) 272 patients with one amalgam filling , (2) 645 patients with ( 2 – 5 ) amalgam fillings and (3) 73 patients with more than 5 amalgam fillings and we investigations for oral lichenoid lesions OLL . The specific points evaluated were number of amalgam fillings in patient with lesions and The results were analyzed.

**Result:** No significant difference was found in the Chi-square test ( $p > 0.05$ ) about relation between the lesions and the number of dental restorative materials in oral cavity .

**Conclusion:** Our results suggest that no association between the number of amalgam fillings and allergic reactions of the oral mucosa in Syria. The most commonly reported problems of local exposure to restorative materials are local inflammatory reactions due to their toxic, irritant, or allergic effects.

**Keywords:** amalgam restoration, allergic reactions , dental restorative materials, lichenoid lesions.



### INTRODUCTION:

Amalgam has been used for the restoration of teeth for well over 100 years, and is the most successful of the direct restorative materials with respect to longevity, it is still being used because of advantages such as low cost, ease of handling, physical characteristics like diversity in applications . On the other hand the disadvantages of dental amalgam occasional allergic responses to some of its components or degradation products, and the toxicity of mercury. Despite the increasing use of tooth coloured materials, with advantages of

aesthetics and adhesion, amalgam is one of the most widely used dental restorative materials. <sup>[1]</sup> However, contact or proximity to restorations

involving amalgam or other materials causes some lichenoid reactions that is to say, lesions that clinically and histologically resemble lichen planus (LP), but have an identifiable etiology. These reactions are presumably due to allergic or toxic reactions to compounds released or generated .<sup>[2]</sup>

Lichen planus LP is a cutaneous disease with and without oral manifestations. Oral lichen planus OLP has various clinical manifestations including reticular, plaque, papular, atrophic, erosive and bullous forms.<sup>[3, 4]</sup> The reported prevalence ranges from 0.5 – 2.2%.<sup>[3, 4, 5, 6]</sup> More than one clinical form is frequently present at a time and oral Lichen planus is one of the most common mucocutaneous conditions seen in dental practice.

variety of other conditions known as lichenoid reactions can simulate lichen planus either clinically or histologically . Side effects from a dental restorative material can be either toxic/irritative or allergic in nature. Therefore the aetiology of OLLs may represent the oral manifestation of a chronic irritation in some patients or be the clinical result of a delayed hypersensitivity reaction in others. Allergic contact lesions represent a lymphocyte-mediated delayed type of hypersensitivity reaction that requires previous sensitisation to the same chemical.

In a study Massone *et al.*<sup>[7]</sup> found that nickel, cobalt, and potassium dichromate were the three most common sensitisers; concomitant positive reactions were present at significant levels. Whereas irritant contact lesions are a form of local inflammation induced by primary contact with chemicals and are not mediated by lymphocytes. A chronic toxic reaction may be established due to repeated or constant influence of toxic agents in low concentrations over long periods of time.

Such reactions are most frequently localised to the contact zone with the toxic agent. Chronic toxic reactions may be seen in areas of the oral mucosa in direct contact with restorations. Very little is known about toxic reactions of the oral mucosa due to amalgam. A pronounced cytotoxic effect of dental materials on cell cultures of oral cells has been reported.<sup>[8, 9]</sup>

Another cause of lesions related to dental restorations may be immunological or toxic reactions to plaque accumulations on the surfaces of the restorations. Such lesions may disappear after improved oral hygiene.<sup>[10]</sup> Plaque reduction may also have surprising effects on mucosal lesions of lichen planus.<sup>[11]</sup> Also psychological aspects and the life style of patients with oral lichenoid reactions should be considered. The results of two published investigations<sup>[12, 13]</sup> showed that patients with oral lichenoid reaction have a tendency to be depressive compared with a control group. The marital status (patients who were divorced or their partner had died) and the frequency of physical activity are also reported to be significantly higher in patients with oral lichenoid reactions than those in control groups.

many reports on the possible association between allergic reactions and dental restorative materials.<sup>[14, 15, 16, 17,]</sup> The majority of these deal with the association between metallic dental appliances and allergic

reactions of the oral mucosa. The most commonly reported problems of local exposure to restorative materials are local inflammatory reactions due to their toxic, irritant, or allergic effects. This reaction may be delayed by at least 48 hours and the clinical presentation may vary depending on the severity of the reaction. These reactions can be either acute or chronic [18,19,20]. Some Patients with acute lesions may present with burning or redness [21,18].

This project aims to determine the clinical features of oral lichenoid reactions (OLRs) and develop a systematic approach to the evaluation and monitoring of the extent and severity of adverse reactions to dental materials in Syria.

The clinician should be aware of all possible pathological etiologies of white lesions. If there is any doubt about the nature or management of an unusual oral lesion, referral to appropriate specialists is mandatory. [22]

The aim of present study is to evaluate the relationship between oral lichenoid reactions (OLRs) and the number of amalgam restorations which contains mercury in the oral cavity, and to determine whether OLL can be caused by allergy to amount in amalgam fillings.

## **MATERIALS AND METHODS:**

The sample consisted of 990 patients with dental restorative materials were analyzed retrospectively, 573 ( 57.9% )

male 417 (42.1 %) female with amalgam fillings (35 women and 85 men; age range: 21-67 years) had oral lichenoid lesions OLL in contact with amalgam fillings. All these patients had reticulate, lacy, plaque-like or erosive lichenoid changes adjacent to amalgam fillings. who visited the Oral Medicine Clinic at the School of Dentistry, University of Damascus and Tishreen. who had oral lesions or symptoms suspected to be related to their dental restorations were investigated. Baseline patch tests for amalgam, biopsies and photographs were undertaken. Health histories and oral examinations were obtained, and we classified the patients to three groups Clinically: (1) 272 patients with one amalgam filling, (2) 645 patients with (2 – 5) amalgam fillings and (3) 73 patients with more than 5 amalgam fillings and we investigations for oral lichenoid lesions OLL in each one of patient.

The specific points evaluated were the clinical features of oral lichenoid lesions OLL and the number of amalgam fillings in patient with lesions and The results were analyzed. Oral lichenoid lesions included striated, reticular, plaque-like, erythematous, erosive, vesiculated, and ulcerative forms. Patients' complaints were of soreness, itching, an unpleasant metallic or battery taste, and pain.

patients with the basic criteria:

- dental restorative materials in close proximity to the lesions;
- not having any autoimmune diseases.

Baseline investigations

History and clinical records.

Each patient were test :

Gender of each one .....

Age of each one.....

The date of start the lesion .....

1. Medical test : Comprehensive history of the complaint and the medical, dental and social histories.

4. Record of the lesions

Classified clinically into three groups:

Ulcerative lesions	Erosive or atrophic lesions	White patches, striated, plaque, or reticular lesions

Classified according to their relationship with restorations.

Oral lichenoid lesions without clinical contact with restorations	Oral lichenoid lesions in clinical contact, and at least one additional site without clinical contact with restorations	Oral lichenoid lesions only in contact with restorations

Classified according to their oral location:

Other part of oral mucosa; lips, floor of the mouth, and palate.	Gingival lichenoid lesions.	Oral lichenoid lesions located on the tongue (lateral surfaces or dorsal surface).	Oral lichenoid lesions located on the buccal mucosa (unilateral or bilateral)

2. Dental test : Patients' detailed description of oral symptoms and complaints, onset in relation to dental treatment, impact of symptoms on discomfort, what they were doing to limit their discomfort.

3. Record of the restorations

Number of patients	Number of fillings

**RESULTS:**

Age and gender

The number of patients with amalgam filling was 990 patients and The number of patients with oral lichenoid lesions included in this study was 120, The findings of 990 patients with dental restorative materials were analyzed

retrospectively clinically without any histopathological information , 573 ( 57.9% ) male 417 (42.1 %) women with amalgam fillings from 120 patients (35 women and 85 men; age range: 21-67 years) had oral lichenoid lesions OLL in contact with amalgam fillings . Clinically, 3 patient groups were identified: (1) 272 patients with one amalgam filling , (2) 645 patients with ( 2 – 5 ) amalgam fillings and (3) 73 patients with more than 5 amalgam fillings and we investigations for oral lichenoid lesions OLL . The specific points evaluated were

number of amalgam fillings in patient with lesions and The results were analyzed.

Statistical methods

Statistical analysis involved descriptive statistics, One Way Anova test , Friedman Test – Chi-Square to find the relation between number of amalgam fillings and the lesions , where appropriate.

The results were as follow :

Table (1) distribution of sample due to gender of patients :

		Number	Per cent %
Gender of patients	Male	573	57.9
	Female	417	42.1
	Total	990	100.0

The sample of this study distributed as 57.9 % male and 42.1 % female.

Table (2) distribution of sample due to presences of lesions:

		Number	Per cent %
presences of lichenoid lesions	Presence	120	12.1
	No presence	870	87.9
	Total	990	100.0
Gender of patients	Male	84	70.0
	Female	36	30.0
	Total	120	100.0

The study has shown presences of lichenoid lesions in 120 (12.1 % ) patients and 87.9 % no presences of lichenoid lesions , and the sample distribution to 70 % male and 30 % female .

Table (3) distribution of sample due to clinical features of lichenoid lesions:

		Number	Per cent %
clinical features	White patches	112	93.3
	Erosive or atrophic lesions	6	5.0
	Ulcerative lesions	2	1.7
	Total	120	100.0

clinical features were as 93.3 % from patients have White patches, striated, plaque, or reticular lesions , 5 % Erosive or atrophic lesions and 1.7 % Ulcerative lesions.

Table (4) distribution of sample due to their oral location :

		Number	Percent %
Classified according to their oral location	the buccal mucosa (unilateral or bilateral)	111	92.5
	on the tongue	2	1.7
	lips, floor of the mouth, and palate	7	5.8
	Total	120	100.0

We found that the oral location of lesions were as follows 111 ( 92.5 % ) patients the lesions located on the buccal mucosa (unilateral or bilateral) , 2 (1.7 %) patients the lesions located on the tongue (lateral surfaces or dorsal

surface ) , 7(5 % ) patients the lesions located on the Other part of oral mucosa; lips, floor of the mouth, and palate and no one have lesions on Gingiva.

Table (5) distribution of sample due to the relationship between restorations and lesions :

		Number	Per cent %
relationship between restorations and lesions	Oral lichenoid lesions in clinical contact, and at least one additional site without clinical contact with restorations	108	90.0
	Oral lichenoid lesions without clinical contact with restorations	12	10.0
	Total	120	100.0

in relationship between restorations and lesions we found that 108 (90 %) patients have Oral lichenoid lesions in clinical contact, and at least one additional site without clinical contact with restorations and 12 (10 %) patients have Oral lichenoid lesions without clinical contact with restorations.

In this study 120 patients who have Oral lichenoid lesions in contact with restorations we counted the amalgam fillings in patients who had Oral lichenoid lesions to investigate the relationship between their , the results were as follows : after divides the fillings into three groups :

Groups of fillings		
	number	Per cent %
Filling <sup>1</sup>	272	27.5
2-5 fillings	645	65.2
more than 6 fillings	73	7.4
Total	990	100.0

the relationship between the amalgam fillings and Oral lichenoid lesions :

Table (6) distribution the number of restorations and lesions :

			Groups of fillings			Total
			1 filling	2-5 fillings	more than 6 fillings	
Presence of oral lichenoid lesions	Presence	Number Per cent %	25 20.8%	86 71.7%	9 7.5%	120 <b>100.0%</b>
	no Presence	Number Per cent %	247 28.4%	559 64.3%	64 7.4%	870 100.0%
Total			272 27.5%	645 65.2%	73 7.4%	990 100.0%

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.085a	2	0.214

The table showed that Chi\_Square =3.0 and Asymptotic Significance (2-sided) P-value=0.214 so the result is no significant difference was found in the Chi-square test ( $p > 0.05$ ) about relation between the lesions and the number of dental restorative materials in oral cavity in Syria.

### DISCUSSION:

From this result we suggested that the number of dental restorative materials don't effect on the oral mucosa by causing Oral lichenoid lesions.

And study of Edwards et al were found that the men was more affected from women, we found that the women more than the men . (Edwards et al , 2002 )

### CONCLUSION:

With the limitation of the study the following conclusions can be made:

OLL may be elicited by dental restorations and the diagnosis depends mainly on the clinical findings including the lesion's characteristics and relationship to restorations.

Further in vivo and in vitro studies are required to achieve a better understanding of the aetiology of OLLs and to provide conclusive diagnostic indicators.

We recommended that the patient should make routine examinations for the amalgam restorations .

## REFERENCES:

1. McCullough MJ Tyas MJ Local adverse effects of amalgam restorations. *Int Dent J* (2008 Feb) 58(1):3-9.
2. Uzun, I., Güler, B., zyürek, T. and Gündüz, K. (2014). Oral lichenoid contact lesion to amalgam restoration: a case report. *Archives of Oral and Dental Research*, 1:2.
3. Thorn JJ, Holmstrup P, Rindum J, Pindborg JJ. Course of various clinical forms of oral lichen planus. A prospective follow-up study of 611 patients. *J Oral Pathol*1988; 17: 213–218.
4. Andreasen JO. Oral lichen planus. 1. A clinical evaluation of 115 cases. *Oral Surg Oral Med Oral Pathol* 1968; 25: 31–42.
5. Axell T, Rundquist L. Oral lichen planus—a demographic study. *Community Dent Oral Epidemiol* 1987; 15: 52–56.
6. Edwards PC, Kelsch R. Oral lichen planus: clinical presentation and management. *J Can Dent Assoc* 2002; 68: 494–499.
7. Massone L, Anonide A, Borghi S, Isola V. Positive patch test reactions to nickel, cobalt, and potassium dichromate in a series of 576 patients. *Cutis* 1991; 47: 119–122.
8. Issa Y, Watts DC, Duxbury AJ, Brunton PA, Watson MB, Waters CM. Mercuric chloride: toxicity and apoptosis in a human oligodendroglial cell line MO3.13. *Biomaterials* 2003; 24: 981–987.
9. Issa Y, Watts DC, Brunton PA, Waters CM, Duxbury AJ. Resin composite monomers alter MTT and LDH activity of human gingival fibroblasts in vitro. *Dental Materials*.
10. Holmstrup P. Oral mucosa and skin reactions related to amalgam. *Adv Dent Res*1992; 6: 120–124.
11. Holmstrup P, Schiotz AW, Westergaard J. Effect of dental plaque control on gingival lichen planus. *Oral Surg Oral Med Oral Pathol* 1990; 69: 585–590.
12. Bergdahl J, Ostman PO, Anneroth G, Perris H, Skoglund A. Psychologic aspects of patients with oral lichenoid reactions. *Acta Odontol Scand* 1995; 53: 236–241.
13. Ostman PO, Anneroth G, Skoglund A. Amalgam-associated oral lichenoid reactions. Clinical and histologic changes after removal of amalgam fillings. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1996; 81: 459–465.
14. Lyzak WA, Flaitz CM, McGuckin RS, Eichmiller F, Brown RS. Diagnosis and treatment of an oral base-metal contact lesion following negative dermatologic patch tests. *Ann Allergy* 1994; 73: 161–165.
15. Wiltshire WA, Ferreira MR, Ligthelm AJ. Allergies to dental materials. *Quintessence Int* 1996; 27: 513–520.
16. Forsell M, Marcusson JA, Carlmark B, Johansson O. Analysis of the metal content of in vivo-fixed dental alloys by means of a simple office procedure. *Swed Dent J*1997; 21: 161–168.



17. Mizoguchi S, Setoyama M, Kanzaki T. Linear lichen planus in the region of the mandibular nerve caused by an allergy to palladium in dental metals. *Dermatology* 1998; 196: 268–270.
18. M. H. Thornhill, M. N. Pemberton, R. K. Simmons, and E. D. Theaker, “Amalgam-contact hypersensitivity lesions and oral lichen planus,” *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics*, 2003 vol. 95, no. 3, pp. 291–299.
19. M. Jontell and P. Holmstrup, “Red and white lesions of the oral mucosa,” in *Burket’s Oral Medicine*, M. S. Greenberg, M. Glick, and J. A. Ship, Eds. 2008 , pp. 77–78, BC Decker, Hamilton, Canada.
20. M. Kaga, N. S. Seale, T. Hanawa, J. L. Ferracane, and T. Okabe, “Cytotoxicity of amalgams,” *Journal of Dental Research* 1988, vol. 67, no. 9, pp. 1221–1224.
21. M. Levy, “Dental amalgam: toxicological evaluation and health risk assessment,” *Journal of the Canadian Dental Association* 1995 , vol. 61, no. 8, pp. 667–671.
22. Aggarwal V Jain A Kabi D Oral lichenoid reaction associated with tin component of amalgam restorations: a case report. *Am J Dermatopathol* (2010)