

Oral lichenoid lesions (OLL) and mercury in amalgam fillings

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84 patients with oral lichenoid lesions (OLL) were seen in the contact dermatitis clinic. All these patients had reticulate, lacy, plaque-like or erosive lichenoid changes adjacent to amalgam fillings. Patch testing to metallic mercury, 0.1% thimerosal, 1% ammoniated mercury, 0.1% mercuric chloride, and in some cases 0.05% phenylmercuric nitrate and amalgam discs was undertaken. 33 (39%) patients had positive patch test findings. 30/33 patch test positive patients had replacement of their amalgam fillings, with 28 (87%) patients experiencing improvement of symptoms and signs within 3 months. This confirms that mercury allergy is a factor in the pathogenesis of OLL in some cases. In cases where patch test negative patients improve with amalgam replacement, mercury may be acting as an irritant in the pathogenesis of OLL.

Key words: amalgam fillings; contact allergy; leukoplakia; mercury; oral lichen planus; oral lichenoid lesions. © Blackwell Munksgaard, 2003.

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Oral lichenoid lesions (OLL) are seen in about 2% of the adult population (1, 2). Clinical presentations include a lacy white reticulate, erosive or plaque-like pattern. Histologically, OLL typically shows liquefactive degeneration of the basal layer with a band-like lymphocytic infiltration. The majority of cases are idiopathic, although a variety of factors, including diabetes, hypertension, immunological disorders and drugs, have been associated with its pathogenesis (3–8). Since OLL can be a painful and recalcitrant condition, the pursuit of a treatable cause is clearly important. Allergic contact dermatitis from dental materials has been reported and, in recent times, there have been a number of reports of OLL secondary to mercury in amalgam fillings (9–16).

Our aim was to study the effect of removal of amalgam fillings in patients with OLL and to determine if patch tests are useful in identifying those who will respond favourably to removal of amalgam fillings.

Materials and Methods

Patients

84 patients with OLL were referred for patch testing between 1985 and 2001 to the Contact & Occupational Dermatitis Clinic of the Skin & Cancer

Foundation, Darlinghurst (Sydney), Australia. The results regarding patients from 1985 to 1994 have been published by Pang & Freeman (17).

Patients were referred by dermatologists, dentists or oral surgeons. All patients' OLL lesions were adjacent to amalgam fillings (Fig.1). The most common site of involvement was the buccal mucosa (80 cases), followed by the tongue (23 cases), gingiva (3 cases) and the lip (1 case). The clinical presentations included a reticular lace-like pattern (44 cases), erosive ulcers (16 cases) and plaque-like changes (10 cases). 14 patients had lesions described as papular or atrophic. 69 patients suffered from oral symptoms, ranging from mild nagging discomfort to severe pain restricting food intake. Multiple treatments had been tried, including topical, intralesional and oral corticosteroids, retinoids and topical antifungals. All proved ineffective in clearing symptoms and signs of OLL.

Patch testing

Patients seen between 1985 and 1994 were patch tested to the European standard series (Trolab: Hermal, Reinbek, Germany) and to 1% metallic mercury and 0.1% thimerosal. 19 patients were additionally patch tested with 1% ammoniated mer-



Fig. 1. Oral lichenoid lesions on buccal mucosa in direct contact with amalgam fillings.

cury, 8 cases to 0.1% mercuric chloride, 6 cases to 0.05% phenylmercuric nitrate and 2 cases with an amalgam disc (all these allergens were also supplied by Trolab).

Patients seen between 1995 and 2001 were all patch tested to the European standard series, ammoniated mercury 1%, metallic mercury 0.5%, thimerosal 0.1% and mercuric chloride 0.1% (metallic mercury 0.5% and mercuric chloride 0.1% were supplied by Chemotechnique Diagnostics, Malmö, Sweden). All allergens were tested in petrolatum (pet.).

Patch test allergens were applied in Finn Chambers on Scanpor (Epitest, Tuusula, Finland) and occluded for 2 days (48 h) on the upper back. Tests were evaluated at 2 and 4 days (3 and 7 days from 1992 onwards). Grading was according to the International Contact Dermatitis Research Group (ICDRG) scale.

Amalgam replacement

30 out of 33 patients positive on patch testing to mercury had their amalgam fillings replaced with

composite resin, gold, porcelain or a combination of these. After a follow-up period of between 2 months and 9.5 years (mean 3.7 years), these 30 patients were evaluated either by telephone interview (25 cases) or in clinic (5 cases). OLL extent and severity was graded:

- healed (no lesions remaining);
- marked improvement (> 80% improvement);
- improved (> 50% improvement);
- no improvement or worsening symptoms/signs (increasing OLL).

Patch test negative patients were mostly advised not to undergo amalgam replacement. However, recent papers have advised amalgam replacement even in patch test negative cases (18, 19). Therefore, of 29 patch test negative patients seen more recently, 14 who were symptomatic were advised to have their amalgams replaced. These patients were followed up from 6 months to 4 years later (mean 2.5 years).

Results

Altogether, there were 84 cases of OLL from 1985 to 2001. The mean age was 57.3 years (range 28–

Table 1. Positive patch tests in 33/84 patients with OLL

	1st Reading	2nd Reading
1% or 0.5% Metallic mercury	28/33	33/33
1% Ammoniated mercury	23/33	28/33
0.1% Mercuric chloride (22 cases)	13/22	15/22
0.05% Phenylmercuric nitrate (6 cases)	1/6	1/6
0.1% Thimerosal	1/33	1/33

Table 2. Follow-up after replacement of amalgam with other dental fillings in patch test positive patients

Outcome	No. of patients
Total	30
Healed	27 (86.6%)
Marked improvement (> 80% improvement)	1
No improvement	2

Table 3. Follow-up of 29 patients seen 1995–2001

Symptomatic patch test negative patients	14/29
Amalgams replaced with other dental fillings	7/14
Healed	1/7
Amalgams not replaced	7/14
healed or only intermittent symptoms	5/7

84) and the mean duration of symptoms and signs was 4.7 years (range 0.2–20). 33/84 patients (39%) showed positive patch tests to mercury and 51 cases (61%) had negative patch tests. Of the 33 patients positive to mercury, 29 were women and 4 were men.

69 patients suffered oral symptoms ranging from mild to severe. 15 patients were asymptomatic. Of these 15, all were patch test negative. Only 1 of the 33 patch test positive patients was asymptomatic. This is significant, suggesting that the patch test negative patients have a less severe form of OLL.

Of the 33 patients allergic to mercury, all 33 were positive to metallic mercury (1.0% in pet. between 1985 and 1994, 0.5% in pet between 1995 and 2001). 28 patients were positive to 1% ammoniated mercury (28/33, 84.8%), 15 patients to 0.1% mer-

curic chloride (45 4,% 15,/33), 1–0.1% thimerosal (0.03%, 1/33) (Table 1).

7 of the 33 patch test positive patients did not show a positive patch test till the 2nd reading.

Results of amalgam replacement

Total replacement of all amalgam fillings was carried out on 29 patch test positive patients with composite resin, gold, porcelain or a combination of these fillings. 1 patient had partial amalgam replacement (1 filling removed), making a total of 30 patch test positive patients who had amalgams replaced.

28/30 (93%) patients had improvement of symptoms within 3 months: 27 patients had complete healing of OLL; 1 patient had marked improve-

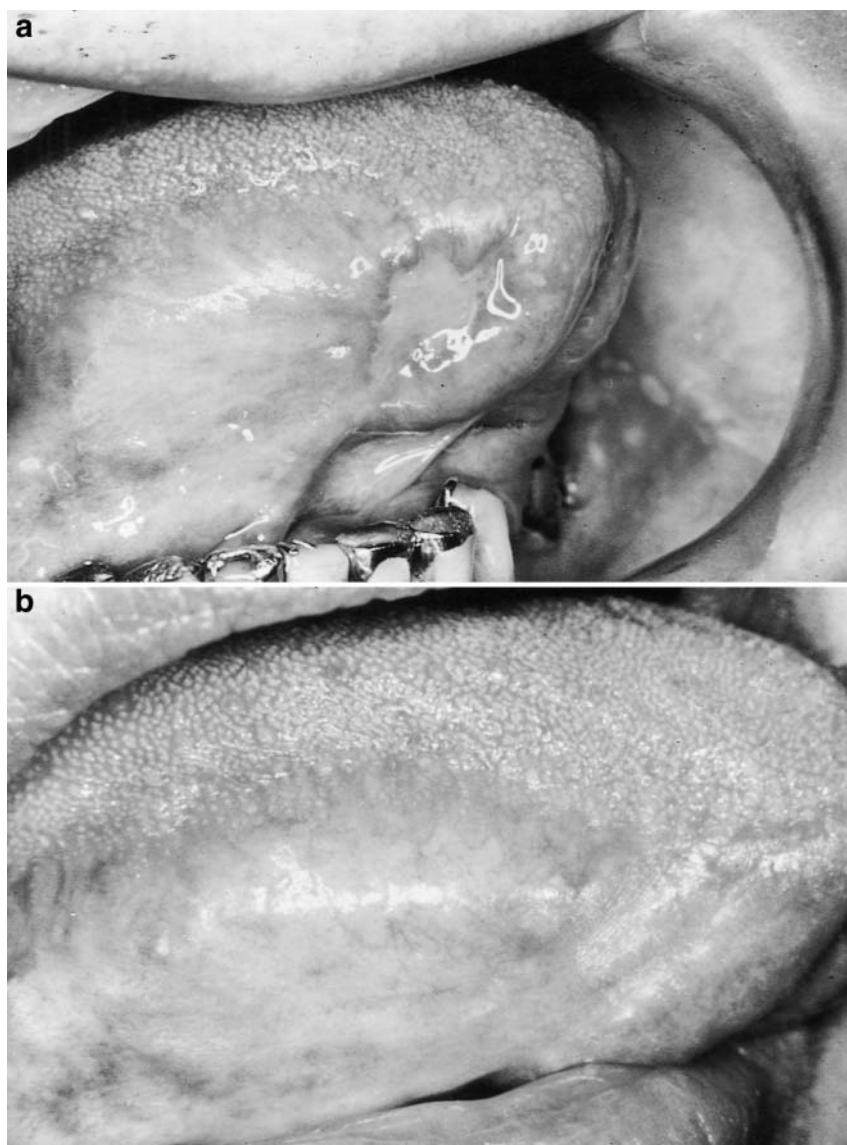


Fig. 2. (a) Chronic erosive tongue ulcer with adjacent whitish plaque-like changes secondary to allergy to mercury in amalgam fillings, present in premolar and molar teeth. (b) Amalgam replacement resulting in complete healing of erosive tongue ulcer and whitish plaque-like changes.

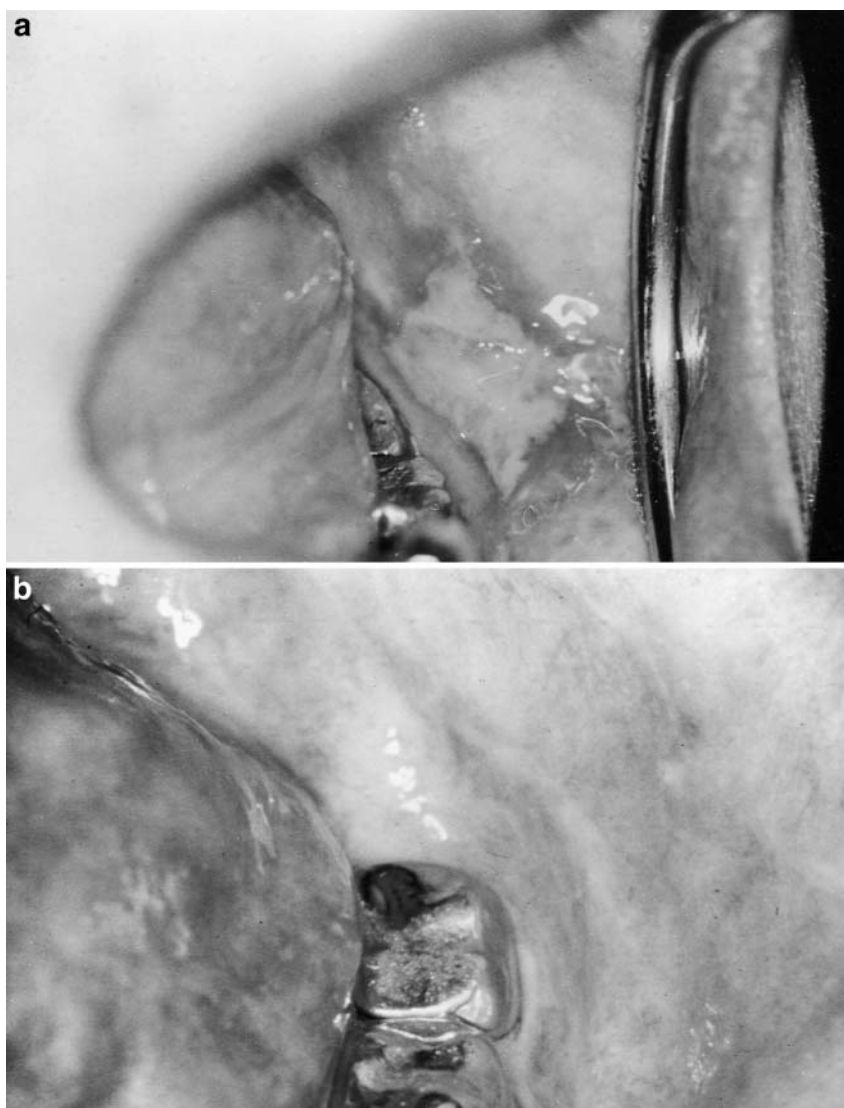


Fig. 3. (a) Large buccal ulcer in direct contact with amalgam fillings. (b) Buccal ulcer healed completely after replacement of amalgam with gold fillings.

ment (Figs. 2 and 3). 2/30 patients had no improvement (Table 2).

Only 14 patients out of a total of 29 with negative patch tests to Hg were symptomatic (that is, 15 were asymptomatic). 7 of these 14 symptomatic patients had their amalgams replaced and only 1 resolved. Six of these 7 did not improve.

Of the 7 who did not have their amalgams replaced, 5 either cleared or fluctuated in severity (Table 3).

Discussion

This study confirms that OLL can be caused by or associated with allergy to mercury in amalgam fillings. This was the case in 33 of 84 (39%) patients with OLL seen at our clinic. This result concurs with previous studies reporting mercury allergy in 16–64% of OLL patients (9, 12, 13, 20). In con-

trast, 1–4% of the normal population show positive mercury allergy (21). In our series, 86.6% of patients (27/30) with treatment-resistant OLL with positive patch tests to Hg healed entirely after complete amalgam removal. 1 patient was symptom free after removal of only the amalgam filling adjacent to OLL (partial removal). This is interesting and in concordance with Smart, MacLeod & Lawrence, who think that removal of all amalgam fillings need not be necessary for symptom improvement (22).

All our patients who responded to replacement of amalgam experienced dramatic resolution of their oral symptoms within 3 months. It was striking how definite they were about their improvement. This rapid healing time is indicative of a role for mercury in the pathogenesis of OLL.

The majority of our patients were older (mean age 57.3 years). Their amalgam fillings had been

present for many years, increasing the likelihood of corrosive damage to the fillings. Indeed, dental amalgam is prone to corrosion due to contact between metals with different electrical potentials in the moist oral cavity, giving rise to electrochemical reactions and increased release of metal ions (22). The possibility of additional irritant factors causing OLL cannot be excluded. Mucosal changes may have toxic as well as allergic or simply electrical causes (13).

This raises the question as to whether patch testing can predict the effect of removal of amalgam fillings. Some previous studies have suggested that patch testing is not helpful in determining which patients will benefit from replacement of amalgam fillings (18, 23). Conversely, Koch & Bahmer suggest that amalgam fillings should only be removed from patients who are patch test positive and who have objective lesions (24). They found a statistically significant difference in the positive effect of amalgam replacement in patients with positive patch tests compared with patch test negative patients. In support of this theory, Laine et al. reported that 28 of 62 (45.2%) patch test positive patients healed completely on amalgam replacement, compared with only 3 out of their 15 (20%) patch test negative patients (20). Laine et al. divided patients with OLL into 2 groups: type 1 or type 2. Type 1 lesions were restricted to the contact area of the fillings; Type 2 lesions exceeded the contact area of the fillings. They found that 78.8% of patients with Type 1 lesions were patch test positive to Hg and that 44/47 of these patients healed completely or remarkably after removal of amalgam fillings, usually within 2–4 weeks (20).

Ibbotson et al. found that amalgam replacement led to resolution in 16 of 17 mercury positive patients and 3 of 4 mercury negative patients. However, this group carried out only 1 patch test reading at 72h (19). Positive readings may be delayed and the study by Koch & Bahmer found that 5 of 15 patients with OLL in close contact with amalgams were positive to mercury only at day 10 (3 patients) and day 17 (2 patients) (24).

Ostman and coworkers reported that replacement of amalgams is more effective with lesions in direct contact with amalgams, rather than those in whom the lesions exceeded the contact area (23). This study also states that there was no statistically significant difference in healing between those who showed a positive or a negative patch test to mercury. However, in this study, only 1 reading was carried out at 3 days, which could potentially miss a late positive reaction. Furthermore, this study tested only with ammoniated mercury, which in our experience is not as sensitive as metallic mercury. It is important to test a wide range of mer-

cury allergens. Laine and coworkers reported a large series of 76 patients with OLL and positive patch tests to mercury (67.8%). That study concluded that the test allergens should include metallic mercury, ammoniated mercury 1.0% and mercuric chloride 0.1% (all in pet.) in order to detect all cases of allergy (15).

In our study, all positive patch test patients were symptomatic, complaining of burning, soreness and pain. In contrast, only 14 of 29 patch test negative patients seen in the last 5 years (50%) were symptomatic. All 14 patients were advised to have their amalgams replaced. However, at follow-up, only 7 had done so and only 1 of these 7 experienced resolution of the OLL. Of the 7 patients who did not replace their amalgam fillings, 5 reported that the OLL had either cleared or fluctuated in severity without amalgam replacement.

In conclusion, our study shows that mercury allergy is a factor contributing to the pathogenesis of OLL in some cases. Amalgam replacement is definitely indicated in those patients with positive patch tests to Hg. Our data show that patients with OLL and negative patch tests to Hg are either asymptomatic or much less troubled by symptoms than those with positive patch tests. They are less likely to want amalgam replacement and only 1 of 7 in our series who had replacement of amalgams had a good result. Hence, we would only advise replacement in those cases with very troublesome symptoms.

Acknowledgements

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