



Paul R Sharma

Allergic Contact Stomatitis from Colophony

Abstract: Colophony is an ubiquitous contact sensitizer which may be present in dental materials, such as periodontal dressings, impression materials, cements, fix adhesives and varnishes. Exposure to a sensitizer in a hypersensitive person may initiate an allergic contact dermatitis/stomatitis. This usually occurs after direct skin/mucosa contact with the sensitizer.

This paper reports the case of a colophony hypersensitive male who developed contact stomatitis after dental treatment with a colophony-containing product.

Clinical Relevance: Sensitizing colophony is present in Duraphat® 2.26%F varnish, a fluoride varnish used all over the world. A case of hypersensitivity to Duraphat® 2.26%F varnish is presented in a patient who, at the initial visit, indicated only an allergy to sticking plasters.

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Presently, approximately 3000 contact sensitizers are known.¹ When a contact-allergic person is exposed to a sensitizer, an allergic contact dermatitis/stomatitis may develop. Usually, the dermatitis/stomatitis is the result of direct skin/mucosa exposure to the sensitizer. However, other exposure routes, such as ingestion and inhalation, may also occur.² Patients subjected to dental treatment may be exposed to many potential sensitizers.

This paper reports the case of a patient who developed contact stomatitis after dental treatment.

Case report

A 29-year-old male attended for dental treatment. He was on no drug therapy. The only adverse reaction he recorded was an allergy to sticking plasters. The patient indicated urticaria and itching at the site where plasters were in contact with his skin.

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Dental treatment commenced uneventfully. The patient received Duraphat® 2.26%F varnish for desensitization of hypersensitive teeth, and treatment was followed within 24 hours by oedema and redness of the tongue and lips plus altered mucosal sensation.

These symptoms worsened over the next 48 hours, necessitating an emergency visit and the prescription of an oral anti-histamine, chlorphenamine maleate 4 mg (Piriton®).

Following a referral to a dermatologist, the patient underwent patch testing towards the European International Standard Battery of patch reagents and to an extended battery of dental materials. In addition, flavouring agents and food additives were tested.

The reaction to flavouring agents and food additives was examined following 20 minutes' direct application to the skin; a positive reading was recorded as the development of an urticarial wheal. The standard series, dental battery and a second set of flavouring agents and food additives were read after 48 hours and 96 hours with a raised or blistering area at the site of contact interpreted as a positive reaction.

The patient reacted positively to colophony. Testing with latex gloves was

negative. Patch testing with Duraphat® 2.26%F varnish alone yielded positive reactions.

Discussion

The immune system is an integral part of human protection against disease, but the normally protective immune mechanisms can sometimes cause detrimental reactions in the host. Such reactions are known as hypersensitivity reactions.

The traditional classification for hypersensitivity reactions is that of Gell and Coombs³ and is currently the most commonly known classification system. It divides the hypersensitivity reactions into the following four types:

- Type I or immediate reactions are mediated by specific Immunoglobulin E antibodies associated with mast cells and basophils, and their clinical manifestations may include anaphylaxis or urticaria/angioedema.

- Type II or cytotoxic reactions. Chemicals may non-specifically adhere to the surface of erythrocytes, platelets, neutrophils, allowing for antibody binding with consequent cell lysis via complement system activation mechanisms or via

Active Ingredient	Function
5% Sodium fluoride	Caries control
	Hypersensitivity treatment
Inactive Ingredient	Function
Beeswax and Ethanol	Together form gel type structure, physically stabilizing the sodium fluoride in Duraphat®
Colophony	Adhesive. Its low viscosity lets Duraphat® flow easily
Raspberry essence	Flavouring agent
Shellac	Provides flexible permeable hard surface
Mastic	Provides flexible permeable hard surface
Sodium saccharin	Sweetener
Colophony, shellac and mastic all prevent solubilization of Duraphat® in saliva.	

Table 1. Composition of Duraphat® 2.26%F varnish, kindly supplied by Colgate-Palmolive.

antibody-mediated cytotoxicity.

■ Type III hypersensitivity, also known as 'serum sickness' occurs owing to the deposition of immune complexes in blood vessels, basement membranes of the skin or glomerulus, activation of the complement system, increase in vascular permeability and neutrophil recruitment. Tissue damage is caused by the release of lytic enzymes by neutrophils and complement activation.

■ Type IV or late hypersensitivity is caused by the interaction of antigen with inflammatory and/or cytotoxic lymphocytes in the absence of antibodies.

Colophony is a soft, sticky material obtained from pine. The main ingredient is abietic acid or its derivatives. In spite of its allergenic properties, colophony is used in dentistry as part of certain root canal sealers, periodontal dressings, impression materials, cements, fix adhesives and varnishes and is present in other items such as adhesives tapes, glues, papers, and cosmetics and sticking plasters.

The patient in this report was Type I hypersensitive to colophony and Duraphat®, with the patient indicating at the first visit a history of sensitivity to sticking plasters before the first known

exposure to Duraphat®.

Histamine is an inflammatory substance, released from mast cells and basophils, which accounts for many of the symptoms of an allergy such as itching and swelling. The prescription of an oral anti-histamine, chlorphenamine maleate 4 mg (Piriton®) in this report, counteracts the effects of histamine, alleviating symptoms.

Intra-oral contact with colophony in sensitized persons may cause urticaria and intra-oral swelling of the tongue, soft palate and lips. Delayed oral lichenoid reactions and occupational hand eczema have also been reported.⁴

Manufactured by A Natterman & Cie GmbH, Cologne, Germany for the licence holder Colgate-Palmolive (UK) Ltd, Surrey, Duraphat® 2.26%F varnish is a widely used fluoride-based agent. Therapeutic indications for use include preventing caries in high risk children and adults, reducing fissure caries, decalcification around orthodontic appliances, the progression of caries lesions and for the desensitization of hypersensitive teeth. Colophony is there to help it stick to the teeth (Table 1).

The Duraphat® 2.26%F varnish is applied as a thin layer to the most affected

areas of the dentition using a brush, probe or swab.

The exposure to Duraphat® was considered to be the sole cause of the allergic contact stomatitis for the following reasons:

- The time relation between the Duraphat® exposure and stomatitis.
- The absence of stomatitis following dental treatments excluding Duraphat®.
- Contact allergy to Duraphat® and colophony.
- No other known source of oral exposure to colophony prior to outbreaks of stomatitis.

Duraphat® contains constituents other than colophony and, theoretically, these may also be sensitizers, and this may, at least in part, explain the hypersensitivity to Duraphat® in the patient. However, when test preparations with the same concentration of colophony were compared, the equivalency in the degree of reactivity for colophony and Duraphat® strongly supports the interpretation that colophony is the sole sensitizer in Duraphat® for the patient.

Contact allergy to colophony is not uncommon, and treatment with Duraphat® is common, yet allergic contact stomatitis, in comparison with allergic contact dermatitis, has not been reported many times before. Explanation possibilities include:

- Mostly children are treated with Duraphat® and colophony hypersensitivity is uncommon among them.
- In cases with stomatitis subsequent to dental treatment, exposure to Duraphat® may be overlooked as a possible cause.
- Stomatitis after dental treatment with Duraphat® in colophony-hypersensitive patients may be rare because of a protective saliva, and differences in the vascular system, and in the distribution and function of Langerhans cells in the oral mucosa, as compared with the skin.^{5,6}

For prevention of allergic contact stomatitis and systemically induced contact dermatitis, patients found to be hypersensitive to colophony should be informed of the necessity to tell their dentists about the contact allergy before dental treatment, and dentists should be encouraged to ask their patients about contact allergy before dental treatment. The prevalence of contact allergy to

in the general population may be around 0.5%, and some of these hypersensitive people may not be aware of their hypersensitivity to colophony, but may indicate an allergy to sticking plasters.

Conclusions

Allergic contact stomatitis and systemically induced contact dermatitis are hard to prevent, but an indication in this case was the patient stating at the first visit a history of sensitivity to sticking plasters. If a patient reports a hypersensitivity to sticking plasters, it may be prudent to investigate further, especially if colophony-containing products, such as certain root canal sealers, periodontal dressings, impression materials, cements, fix adhesives and varnishes are to be used. Further

investigation may involve a referral to a dermatologist for patch testing.

The Colgate Duraphat® 2.26%F varnish information leaflet, revised in March 1999, contra-indicates the use of the product in colophony-hypersensitive individuals.

References

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BOOK REVIEW

MCQs for Dentistry. By Kathleen FM Fan and Judith Jones. Knutsford: PasTest Ltd, 2006. (220pp. p/b, £16.95). ISBN 1-904627-52-8.

This small, soft-backed book is intended to be used in preparation for anyone taking MCQ examinations. As stated in the authors' introduction, Multiple Choice Questions as an examination form have been in and out of fashion over many years, but rightly they suggest that their usage remains a popular way of assessing the breadth of a candidate's knowledge and also his/her ability to recall information. Interestingly, the authors' own identity, as regards their qualifications and academic home remains a mystery as they are not given anywhere within this volume.

The book contains more than 200 multiple choice questions, which are divided into ten subject-based chapters covering:

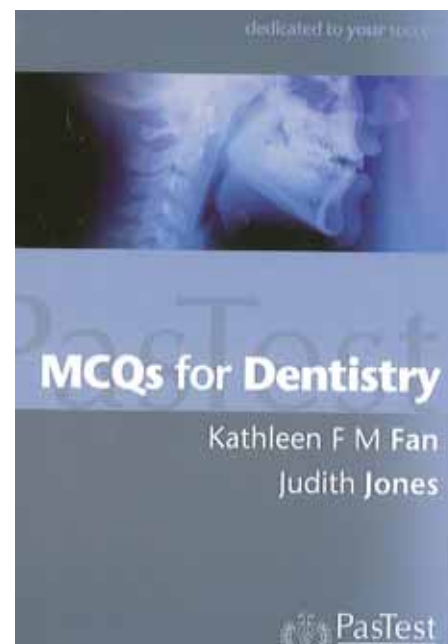
- General dentistry
- Human disease
- Oral medicine
- Oral pathology
- Oral surgery
- Child dental health & Orthodontics
- Therapeutics
- Dental materials
- Radiology & Radiography
- Restorative dentistry

The book is formatted with

statements related to each question followed by five related phrases which are true or false. There are three questions on each page and the answers are given, not at the end of the chapter, as is common, but on the reverse of the question page. A slight irritation to the reviewer was that the answers often follow the order of the phrases – thus, if the correct answer is the fourth or fifth phrase, the incorrect phrases are explained before the right answer is given, leading to some confusion.

The authors have striven to write questions and answers without ambiguity and in this they have largely succeeded. However, some questions, notably in the oral medicine section, may not favour the more knowledgeable or thoughtful candidate, and there is some repetition of questions in different forms in various sections. None the less, to probe the breadth of one's own knowledge is a useful exercise for all practitioners, and this book would be a worthwhile investment for anyone who wishes to assess their breadth of knowledge, whether putting themselves forward as an examination candidate or for their own self-assessment.

In an era of computer-based learning, is a small soft-backed book appropriate? I would suggest that, as a busy clinician, to be able to pick up this book at a moment's notice makes it far more likely to be used. As an undergraduate with



a few moments in a clinic, or as a dentist in the surgery, to be able to test yourself without recourse to a computer screen is still a considerable asset. As a revision tool, this book will impart little new knowledge, but should show up any gaps in one's understanding and encourage focus on one's future learning needs. Used like this, I am happy to recommend the purchase of the book.

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