Endodontic Treatment in Cases of Allergic Reaction to Rubber Dam

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Abstract

The oral cavity is a complex area to handle with about thirty-two teeth, highly vascular tongue, oral mucosa, and gingival. It becomes challenging for the clinician to handle a single tooth in focus with patients movement of vascular tongue and especially in very apprehensive subjects. Hence rubber dam has proved to be a boon not only protecting the tongue, mucosa, and gingiva but also increasing the point of focus for the clinician. Secondly, it reduces infected aerosol procedures thus protecting the clinician and the attendee. Sometimes rarely patients do have allergies to latex or rubber dam and they are not aware. Hence the clinician must ask for leading questions to rule out latex allergy. If the subject does have a latex allergy modifications are required before the treatment.

Keywords: *Endodontic Treatment; Allergic Reaction; Rubber Dam.*

Introduction

To induce a desirable working area in the oral cavity there should be proper moisture control, visibility, and good accessibility. If a file or reamer is mistakenly swallowed during root canal treatment without rubber dam placement then it is likely to confront a lawsuit as Grossman stated that "in the eyes of the court, when an endodontic instrument escapes from dentist's fingers and is ingested or aspirated, expert opinion is unnecessary to justify claims of negligence". Rubber dam sheets are available as heavy, medium, light, and in different colors and standard sizes. Readymade sheets are available in 5×5'' and 6×6'' and rolls according to need which may be conveniently cut into necessary size. It is usually made up of latex material. For patients with latex allergy, non-latex rubber dam material is used in clinics.[1-3]

Case Report A: A 67-yr-old, female patient was referred to the undergraduate clinic for root canal treatment of a mandibular first molar with symptoms of pulpitis.

The past medical history was non-contributory. The patient only reported food and fruit allergies, although she was unaware of the cause of the allergies and the exact model of their manifestation.

During the first appointment, an access cavity was prepared, a dental rubber dam isolation was done, and instrumentation was started with the operating student wearing gloves throughout the procedure. After 20 min, the patient complained of a slight itchy feeling on the lips. The treating student attributed the event to a possible irritation caused by the irrigation solution, and the treatment was carried on.

During the second and third appointments, the same feeling on the lips caused even greater discomfort. Still, the treating student did not give the incident the appropriate consideration. On the afternoon of the third appointment, the patient called the student to report

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pruritus, redness, and inflammation on her lips, perioral, and intraoral region, together with inflammation and burning of her tongue, followed by inconvenience in breathing.

The patient was seen the next morning by the faculty. It was then that contact dermatitis stomatitis due to an allergic reaction to rubber dam was diagnosed. The student was advised to avoid latex products when treating the patient. The patient was advised to proceed with dermatological tests to identify the source of the allergies.

In the remaining appointment, the patient was seen in a separate treating room, the student and the supervising dental staff wore non-latex dental gloves, and a polyvinyl chloride dam was used. The symptoms did not reappear.

Case Report B: A 75-yr-old, retired, female nurse was referred by a general practitioner for root canal treatment of an acute apical abscess of the left maxillary canine. The past medical history of the patient revealed an allergy to penicillin as well as to latex. Five years before treatment in our facility, she had a life-threatening experience of an immediate type I hypersensitivity reaction. The incident occurred when after wearing a brand new brassiere for only 30 min, she developed pruritus with erythema and edema. She did not understand what exactly was happening, and because she was outdoors, she could not get self-examined. After 1 hr of discomfort, she started feeling dyspnea and dizziness. She was carried unconscious to the hospital, where an immediate type I hypersensitivity reaction with laryngeal edema and urticaria was diagnosed. Among other clinical and laboratory examinations, a skin prick test was performed, which indicated an allergy to natural latex. She did not report having undergone multiple surgeries in childhood or a tendency to develop atopy, and she did not report any food allergy. After her life-threatening experience, she was advised by her physician to minimize contact with latex products.

Because a diagnosed latex allergy was reported in her medical history the treatment was intelligently modified. She was always scheduled to be the first appointment of the day. No antihistamines or corticosteroids were administered. Care was taken to exclude any latex products from the room. The dentist and the assistant wore vinyl gloves (Romed, Wilnes, The Netherlands), and for tooth isolation, polyvinyl chloride dams (Hygienic, Akron, OH) were used. Rubber stoppers were not used on endodontic instruments. No symptoms resulted.

Discussion

The case-report A, who was not aware of her sensitivity to rubber dam, was fortunate to experience a non-life-threatening, nonfatal allergic reaction to rubber dam. The patient was terrified, and the student was in an unpleasant position, having caused discomfort to the patient by neglect. The patient did report an allergic sensitivity to fruit, but the student did not insist on getting more details, because she did not evaluate the information that was given as relevant to her practice. Patients sensitive to papaya, banana, avocado, chestnut, apricot, kiwi, pineapple, peach, nectarine, plum, cherry, melon, fig, grape and passion fruit these fruits seem to be predisposed to develop latex allergy. Even food such as potato, tomato, and celery are on the list. From the moment the itching started, the student should have been alarmed.[4-5]

As far as the patient in case report B is concerned, everything seemed to be under control once the sensitivity was reported. Efforts were made to create a latex-free environment during all stages of the therapy. Her occupation as a nurse alone could not indicate her to be a person at high risk because in the period she was practicing, the use of latex gloves wasn't recognized as an occupational hazard in the medical community. Therefore, she couldn't have been exposed to latex allergens because of her occupation.[6-9]

Non-latex gloves and a dam were used. At the stage of obturation, the practitioner was careful not to extrude the gutta-percha cone into the periapical tissues. There have been reports that GP and rubber seem to be chemical isomers and gutta-percha could trigger an allergic reaction as well in patients with sensitivity to latex.Some fruits such as bananas and avocado pears contain cross-reacting proteins with latex. An interesting finding from this study is that patients who were allergic to latex but not to fruits lacked the 30-kD protein band. Signs of allergic reactions to these fruits include pruritus, tightness in the throat, breathing difficulty in patients allergic to fruits have an 11% risk of a latex reaction, patients allergic to latex have a 35% risk of a reaction to fruits.[10-12]

There are noted precautions for latex-sensitive patients such as taking thorough history which are tailor-made to evaluate latex allergy. Refer the patient to the general physician asking the physician for latex-sensitive testing. Precautions should be taken as an emergency medical kit with non-latex airway bags, masks, bandages & tape should be available at a wink of an eye. It is advisable to schedule latex-sensitive patients as the first patient of the day. Better to use glass syringes over plastic or pre-filled or single-use syringes since the plunger may contain rubber. Use of non-latex devices (gloves, dams,etc) & rubber dam napkins. After taking all precautions if a reaction occurs then discontinue the treatment & observe the patient for at least 20 min, medical intervention may be needed.[13]

Root canal treatment in patients with rubber latex allergy could be uneventful if certain precautions are taken.

- Thorough history with particular questions on allergies to latex and previous allergy to rubber material experience should be noted. The dentist should be aware of the latex-fruit syndrome and be cautious when treating a patient who reports an allergy to fruits.
- In case of a positive latex allergy history or cases of high-risk patients, confirmative diagnosis is necessary with either in vitro tests such as serological tests or with more reliable in vivo tests such as a skin prick test, use test or patch test.
- The dentist should be in touch with the patient's general physician informing him/her about the procedure to follow and consult on the need for any premedication with corticosteroids.
- The first aid kit must be routinely checked to ensure that it is equipped with corticosteroids and epinephrine for intravenous or subcutaneous injection. Oxygen masks should be ready in case they are needed.
- An environment without latex has to be created to treat such a patient. The patient must be the first patient of the day to prevent the previous entrance of anyone carrying latex allergens into the treating room.
- Nonlatex gloves should be used. Gloves from synthetic materials such as nitrile and styrene-ethylene butadiene styrene (SEBS), are available in the market. It has been found that the cornstarch powder used in surgical latex gloves forms a complex with latex proteins, which is gradually aerosolized. The complex is kept as a reservoir on surfaces, unwashed hands, and clothes, and even worse, is transported when handling non-latex products, sensitizing the patient.[14]
- For tooth isolation, alternative materials like Polyethylene or polyvinylchloride dams have been proposed. Under the rubber dam,a cellulose separator could be used to prevent its contact with the mucous membrane.
- The practitioner should avoid any product with questionable latex content during the treatment of such a patient. The misleading "hypoallergenic" labeling that can be found on many natural rubber products refers to the sensitivity to residual levels of processed chemicals that those products can provoke. It is therefore essential to avoid them and make sure that non-latex products are used.
- Endo files, reamers must be used without a rubber stopper. As an alternative inerasable ink or wax could be used to point out WL in files and reamers
- As far as the selection of the obturating material is concerned because gutta-percha is the only widely acceptable material, special care should be taken to avoid its extrusion into the periapical tissues to prevent any possible allergic reaction.
- The patient must be advised to avoid products containing natural rubber in his everyday life to avoid sensitization. The list of such products seems to be endless, because there are over 40,000.15,16

Conclusions

The daily practice of endodontics needs to be readapted, and alternatives to the routinely used products must be incorporated in the dental office to treat patients with latex allergy with safety. It is the clinicians' responsibility to be careful of the prevalence of rubber allergy and to be able to perform endodontic therapy without endangering the patient's life.

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