Short Communication

Fatal Anaphylactic Shock Due to a Dental Impression Material

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Materials used for dental impressions are usually safe. This study describes a case of fatal anaphylaxis that appeared immediately after the oral mucosa came into contact with an alginate paste used for dental impressions. The cadaveric examination and the postmortem toxicology report confirmed that the cause of death was anaphylactic shock. The patient was affected by both cardiovascular and lung diseases that worsened the condition and forbade the use of epinephrine. To the authors' knowledge, dental impression materials, and alginate in particular, have not been reported previously as being a cause of anaphylaxis. *Int J Prosthodont 2009;22:33–34.*

On the occasion of a retrospective analysis of forensic-autopsied deaths in the last 15 years at the University Hospital of Messina, an interesting case of anaphylaxis occurring in 1994 was found.

A 75-year-old man with diabetes, cardiopathy, and chronic bronchitis underwent a domiciliary dental impression for a new denture. Immediately after the use of an impression paste, the man presented with dyspnea and tongue edema. After being taken to the closest hospital, a severe edema of the tongue, epiglottis, and glosso-epiglottic region was observed. The patient was treated with 4 mg of ev betamethasone and after some improvement in swelling, he continued aerosol therapy with betamethasone and oxygen.

One hour later, the patient suddenly worsened. He was again treated with 4 mg of ev betamethasone and underwent a tracheotomy. Ten minutes later, despite a CPR attempt, the patient died. He had no prior history of atopy or adverse drug reactions.

Materials and Methods

The cadaveric exam showed an increased volume of the tongue (Fig 1), with evident tumefaction of the papillae of the root that caused a severe occlusion of the laryngeal ostium (Fig 2). Laryngeal and tracheal mucosa were both red with tumefaction of the aryepiglottic folds and vocal cords; the epiglottis was thickened. Little pieces of an easily removable white-gray soft material were present in the esophagus and stomach.

The histologic exam showed edema in the tongue and airways with mucus hypersecretion, contraction of the bronchial wall with mast cell degranulation, and extensive pulmonary and bronchial hemorrhaging with acute emphysema. Chronic bronchiectasic bronchitis, lung fibrosis, chronic bullous emphysema, coronary fibrosis with nonocclusive intramural hematoma, anascitic cirrhosis, and generalized atherosclerosis were also present.

A postmortem toxicology report dictated that toxicologic hexogen agents, volatile and metallic poisons, and toxic anions were absent.

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Fig 1 Edema of the tongue.

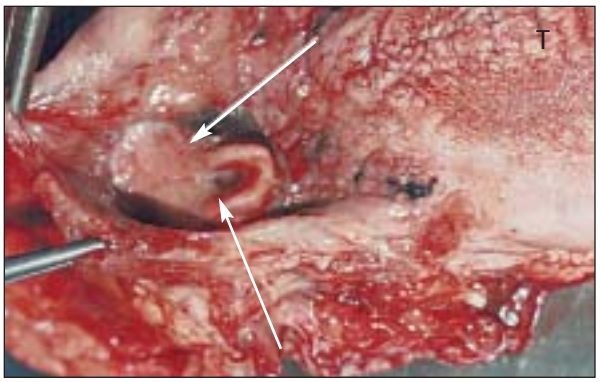

Fig 2 Severe occlusion of the laryngeal ostium at the cadaveric exam. The upper arrow shows the epiglottis, the lower arrow shows the pharyngeal ostium of the larynx. T = tongue.

A chemical examination of the material found in the esophagus and stomach was also performed. It was concluded that this material did not contain any toxic substances and that it had the same chemical components as Kromopan, a compound used to make dental impressions.

Discussion

The cause of death was heart failure, an acute myocardial insufficiency with the involvement of several other pathologic factors. These factors were, in part, caused by anoxia due to the delay of respiratory exchanges as well as bronchospasming. They were also partly caused by a preexistent chronic bronchopathy, coronary fibrosis complicated by intramural coronary hematoma in an atherosclerotic plaque that caused a further delay of blood in pulmonary circulation. Moreover, we cannot exclude the functional deterioration of the liver and kidneys. The concluding cause of death was anaphylactic reaction.

Serum tryptase concentration was not performed because before the year 2000, this test was not used routinely for suspected cases of anaphylaxis.[1]

The autopsy showed cardiac and bronchial findings to be comorbid diseases; the most common pathologies found in patients undergoing autopsy deceased due to anaphylaxis.[1] These conditions forbade the opposition to increasing dynamic requests in reference to the impediment of respiratory exchanges and slow lung circulation. Moreover, the presence of a cardiovascular disease did not allow for the administration of epinephrine.

The substance hypothesized as a trigger factor, Kromopan, is not a known allergenic or anaphylactoid. Kromopan is an alginate used to make high-precision impressions with chromatic phase indicators. The chemical composition of the substance is a combination of fossil flour (diatomaceus, 70% to 75%), sodium arginate (10% to 12%), calcium sulphate (10% to 12%), sodium phosphate (1% to 2%), sodium fluotitanate (1% to 2%), and magnesium oxide (1% to 2%). The chromatic indicators are timophthaleine and phenolphthalein (lower than 0.02%). The safety data sheet reports that the product has not had any hazardous reactions, nor does it have any hazardous decomposition products.

Among the Kromopan components, only phenolphthalein has been reported as causing toxic epidermal necrolysis[2] and fixed drug eruption.[3]

Conclusion

It is difficult to hypothesize which substance was responsible for the anaphylactic reaction since it is easy to come into contact with and become sensitive to any of them. However, it is important to underline the fact that the death occurred due to the presence of comorbid diseases that worsened the patient's clinical situation and forbade the use of the classic lifesaving drug known to treat anaphylaxis.

References

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