



Intraoperative Anaphylactic Shock Due to Latex Allergy: Case Report

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Abstract

Anaphylaxis is an acute and fatal systemic allergic reaction to an allergen, and it can be an unpredictable and life threatening during anesthesia. Latex is the second most common cause of anaphylaxis following the neuromuscular blocking agents during general anesthesia or surgery. We present a case of an anaphylactic reaction that 42-year-old male patient, with a diagnostic suspicion of appendicitis, who underwent an emergency surgery under general anesthesia. Prevention, diagnosis, treatment, and follow-up of patients affected by this event was represented for anesthesiologists. The aim of this report was to describe a case of severe latex induced anaphylactic reaction and discuss its diagnosis and treatment.

Key Words: Allergic reaction, anaphylactic shock, latex

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Introduction

Anaphylaxis during anesthesia occurs infrequently but is known to cause death in approximately 0.65-2% of cases (1). Furthermore, once anaphylaxis occurs, it is life-threatening, so the anesthesiologist must know how to manage it promptly and accurately. It is difficult to diagnose and find the cause for anaphylaxis after the induction of general anesthesia, because there are numerous types of drugs used during general anesthesia that can cause allergic reactions.

Latex is a material obtained from the fluid substance of plants and is commonly used in the structure of medical products (2). Exposure to latex may also take place via parenteral, mucous membranes, skin contact or through the allergens in the air (3). Natural rubber latex allergy appears to be as an increasing health problem in operation rooms. Latex allergy may cause clinical symptoms ranging from mild dermatitis to life threatening anaphylactic reactions.

We experienced a sudden hemodynamic collapse due to an unknown cause immediately after starting surgery. Our objective in this case is to present an anesthetic approach to the patient who developed anaphylaxia due to latex allergy.

Case Report

A 185 cm, 74 kg and 42-year-old male patient, with a diagnostic suspicion of appendicitis, who underwent an emergency surgery under general anesthesia. The patient's history to latex allergy development during a surgery that was carried out five years ago with atopic story..The routine laboratory examinations, lung graph and ECG of the patient were normal and intravenous premedication [(1 mg/kg diphenhydramin hydrochloride (Benison ampule, Osel, Istanbul, Turkey), 1 mg/kg ranitidin (Ranitab ampule, Deva, Istanbul, Turkey) and 1 mg /kg methylprednisolon (Prednol-L ampule, Mustafa Nevzat, Istanbul, Turkey))] was applied 1 hour prior to the operation. Non-latex medical material, adrenaline and resuscitation equipment were prepared in the surgery room. Standard non-invasive monitoring was established, heart rate was 75/minute, arterial blood pressure was 120/75 mmHg and SpO₂ was %100. Following the preoxygenation with plastic breathing circuit and face mask, crush

intubation was performed with 150 mg propofol and 40 mg rocuronium using polyvinylchloride endotracheal tube. Anesthesia was maintained with sevofluran 2–2.5 % in 60% nitrous oxide and 40% oxygen. Antibiotic drug, 1 g of cefazoline, was administered intravenously. Approximately 45 minutes after beginning of the surgery, the patient developed an anaphylactic reaction with bronchospasm, hypotension (50/35 mmHg), tachycardia (125 beat/min.) and later on desaturation (80%). The lungs were ventilated with oxygen ($\text{FiO}_2 = 1.0$). Despite 10 mg ephedrine was administered intravenously there were no changes in arterial pressure or heart rate. Rale and wheezing in both lungs were heard upon auscultation of the chest, thus airway secretions were removed by tracheal suction and salbutamol sulfate (VentolinTM inhaler, 100 µg/ puff, GlaxoSmithKline, Madrid, Spain) was sprayed 2-3 times through the endotracheal tube. Arterial cannulae and central catheter were placed to follow-up closely hemodynamics. An arterial blood gas analysis was performed, which showed pH 7.17, PaCO_2 60.6 mmHg, PaO_2 80.7 mmHg, HCO_3^- 21.5 mmHg, SaO_2 92.5%, Na^+ 154.2 mmol/L, K^+ 5.16 mmol/L, and Ca^{2+} 1.46 mmol/L. Latex or latex cross sensitivity-induced anaphylaxis was considered, adrenalin 5 µg/kg (total of 350 µg) and 1–2 mg/kg methylprednisolone (150 mg) injections were carried out at intervals. After the first adrenaline dose hemodynamic stabilization was provided. The patient's vital signs were as follows; arterial pressure of 127/68 mmHg, pulse rate 108 rates/min, and SpO_2 of 96%. Surgery was completed without encountering another problem. Total anesthesia time was 75 min and total surgery time was 55 min with infused crystalloid solution, infused colloid solution, estimated blood loss, and urine volume of 1,200 ml, 450 ml, 50 ml and 350 ml, respectively.

Repeated arterial blood gas analysis was showed pH 7.37, PaCO_2 35.6 mmHg, PaO_2 103.7 mmHg, HCO_3^- 22.45 mmHg, SaO_2 98.5%, Na^+ 14.2 mmol/L, K^+ 4.16 mmol/L, and Ca^{2+} 1.68 mmol/L. Anesthesia was terminated and the patient was extubated after started breathing spontaneously and returned protective reflexes. The patient was transferred to the reanimation unit for close observation and follow up. No complications occurred during the postoperative course and the patient was discharged 2 day after the operation.

Discussion

Latex based products are commonly used in medical field however there is no clear information contain latex or not in some product. In addition, latex particles can stay suspended in the air for at least one hour and this may cause life threatening situations for patients with latex allergy in surgical environments (4). Some of the cases have no history of contact with material containing latex (5). The greatest risk factors in latex sensitivity are intensive contact with latex antigen (gloves, urinary catheter, rubber drain and catheter made of latex), atopy (genetically prone to allergy), and the story contained surgery and dental therapy. Atopy is one of the most important risk factors known to be related with latex allergy and may increase the risk of latex allergy by 5-25 times (6). It should investigate during preoperative evaluation whether there is any urticaria, rhinitis, conjunctivitis, wheezing, hypotension, edema on the face or the larynx due to exposure to any drugs or materials. In our case there was a history of latex allergy development during a surgery that was carried out five years ago.

Many materials used in anesthetic applications (needle, vial, infusion sets, masks, breathing circuit, pulse oxymeter probe, ECG electrodes, tension sleeve, stethoscope, sterile and non-sterile gloves) include latex (3). Therefore, silicon, plastic and polyvinylchloride products should be used instead of latex containing materials during the perioperative period for especially latex sensitive patients (7). Non-latex silicon mask, plastic breathing circuit and balloon along with polyvinylchloride endotracheal tube were used for our case in the surgery room. The operation was carried out by using non-latex containing polyurethane gloves.

Pharmacologic prophylaxis with steroid and H₁-H₂ antagonists alone cannot prevent anaphylaxis development. Also the surgery room should be cleared of latex prior to the operation (8). In our case, H₁-H₂ antagonists and steroid prophylaxis was applied preoperatively and prepared resuscitation equipment with latex free products. Allergic reactions due to latex are generally observed as type I (anaphylactic type), occur in 30–60 minutes after anesthetic induction and characterized by cardiovascular collapse (9). In our case bronchospasm, hypotension and tachycardia with desaturation were observed in 45th minute after induction. Symptoms of an anaphylactic response are typically related to cardiovascular collapse such as hypotension, tachycardia, and oxygen desaturation. When cardiovascular collapse of an unknown cause occurs, a differential diagnosis of latex-caused anaphylaxis

should be considered. Anaphylaxis is suspected during anesthesia, the anesthesiologist should remove all possible causative factors and take proper managements, such as ventilation with 100% oxygen, administration of epinephrine, antihistamines, and steroids. In our case, anaphylaxis was diagnosed with the history of the patient and the clinical findings. Elimination of latex in the air of surgery room and use latex-free materials are ways to prevent latex anaphylactic reaction. In this case, it may be that latex particles was not eliminated sufficiently enough in the surgery room due to emergent surgery.

In a conclusion, anaphylaxis is an infrequent event in the operating room, but, when it occurs, it may be life-threatening. Anesthesiologists should focus on patient's history, even in urgent procedures, being aware of the limitations arising on these situations. The prognosis of anaphylaxis depends on prompt initiation of adequate treatment; diagnosis is not limited to the event occasion, but to the determination of the causative factor. Early recognition and proper emergent treatment are essential to reversing this complication.

References

1. Greenberger PA, Rotskoff BD, Lifschultz B. Fatal anaphylaxis: postmortem findings and associated comorbid diseases. *Ann Allergy Asthma Immunol.* 2007; 98(3): 252-7.
2. Hepner DL, Castells MC. Anaphylaxis during the perioperative period. *Anesth Analg.* 2003;97(5): 1381-95.
3. Brock-Utne JG. Clinical manifestations of latex anaphylaxis during anesthesia differ from those not anesthesia/surgery related. *Anesth Analg.* 2003;97(4): 1204-5.
4. Setlock MA, Cotter TP, Rosner D. Latex allergy: Failure of prophylaxis to prevent severe reaction. *Anesth Analg.* 1993;76(3): 650-3.
5. Merrett TG, Merrett J, Kekwick R. The prevalence of immunoglobulin E antibodies to the proteins of rubber (*Hevea brasiliensis*) latex and grass (*Phleum pratense*) pollen in sera of British blood donors. *Clin Exp Allergy.* 1999;29(11):1572-8.
6. Huber MA, Terezhalmay GT. Advers reactions to latex products: preventive and therapeutic strategies. *J Contemp Dent Pract.* 2006;7(1): 97-106
7. Ebo DG, De Clerck LS, Stevens WJ. IgE-mediated natural rubber latex hypersensitivity: an update. *Acta Clin Belg.* 2002; 57(8): 58-70.
8. Holzman RS. Clinical management of latex-allergic children. *Anesth Analg.* 1997;85(3):529
9. Tedeschi A, Corini M, Suli C, Cugno M. Detection of serum histamine releasing factors in a patient with idiopathic anaphylaxis and multiple drug allergy syndrome. *J Investig Allergol Clin Immunol.* 2007;17(2): 122-5.