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CASE REPORT



Allergic myocardial infarction: Type I Kounis syndrome following blue crab consumption

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ABSTRACT

Objectives: Allergic myocardial infarction, known as Kounis syndrome, is an acute myocardial infarction after an allergic reaction to food, drugs, or insect stings, etc. Kounis syndrome can also be caused by all kinds of seafood, such as finned fish, molluscan shellfish, cephalopods, and crustacean shellfish.

Methods: Herein, we report a case of a 67-year-old man, with hypertension, referred for itchiness, facial rash, chest pain, and palpitations developed after consumption of blue crab.

Results: Electrocardiogram showed ST elevations in leads II, III, aVF. Transthoracic echocardiography revealed inferior wall hypokinesia with a left ventricular ejection fraction of 55%. Coronary angiography revealed no sign of atherosclerosis. The patient was diagnosed to have Kounis Syndrome type I variant, secondary to blue crab ingestion. He was treated with oral antihistamines and prednisolone. The repeated cardiac markers were within normal limits, with resolution of electrocardiographic abnormalities and inferior wall motion echocardiographic changes.

Conclusion: All patients admitted to the emergency department with chest pain and ST elevation on electrocardiography should be asked about allergic insults.

KEYWORDS

Allergy; Kounis syndrome; myocardial infarction; blue crab

Introduction

Although myocardial infarction due to an allergic insult is first described in 1950 [1], the first definition of allergic angina and allergic myocardial infarction as a different clinical entity is made 41 years after the first report [2]. Kounis syndrome is caused by inflammatory mediators such as histamine, neutral proteases, arachidonic acid products, and a variety of cytokines and chemokines released, during mast cell degranulation [2]. There are several factors and diseases which may induce Kounis syndrome such as hymenoptera (e.g. bee) and viper venom, food allergens (e.g. shellfish), oral and parenteral drugs, stings by ants and jellyfishes, various conditions (angioedema, bronchial asthma, urticaria, exercise-induced allergy, mastocytosis, and serum sickness), and a variety of environmental exposures (e.g. grass cutting, poison ivy, latex contact, limpet ingestion, and millet allergy) [3]. Two specific diseases that are associated with Kounis syndrome, Anisakiasis and Scombroid syndromes together with fish skin contact, fish skin prick, fish inhalation, and fish-made gelatins constitute the whole causative spectrum of fish-induced allergic or allergy-like manifestations [4]. Herein, we report the first case of Kounis syndrome after consumption of blue crab.

Case report

A 67-year-old man with no history of atopy presented with precordial pain, itchiness, facial rash, chest pain, and palpitations 1 h after consumption of blue crab. The patient and his family denied any history of asthma or known history of drug or food allergy. The patient had never experienced a severe allergic reaction in the past. Upon emergency department (ED) arrival, vital signs were as follows: temperature 37.1°C, heart rate 83 bpm, blood pressure 110/70 mm Hg, respiratory rate 24 breaths per minute, and pulse oximetry 98% on room air. On examination, he was noted to be in mild respiratory distress with urticarial rash on his face. There was no significant tongue swelling, edema of the uvula, or stridor. Cardiorespiratory examination was significant for tachypnea and expiratory wheezing. He had no history of coronary artery disease, diabetes mellitus, smoking, or hyperlipidemia. He had been taking amlodipine besylate and candesartan cilexetil prescribed for hypertension. His electrocardiogram showed ST-segment elevations in leads II, III, aVF (Figure 1). Transthoracic echocardiography, performed in the emergency department, revealed inferior wall hypokinesia with a left ventricular ejection fraction of 55%. Coronary angiography performed to exclude coronary artery disease and revealed no sign of coronary atherosclerosis. Troponin-I estimated 4 h after admission was 6.2 ng/mL (reference: 0–0.1 ng/mL) and

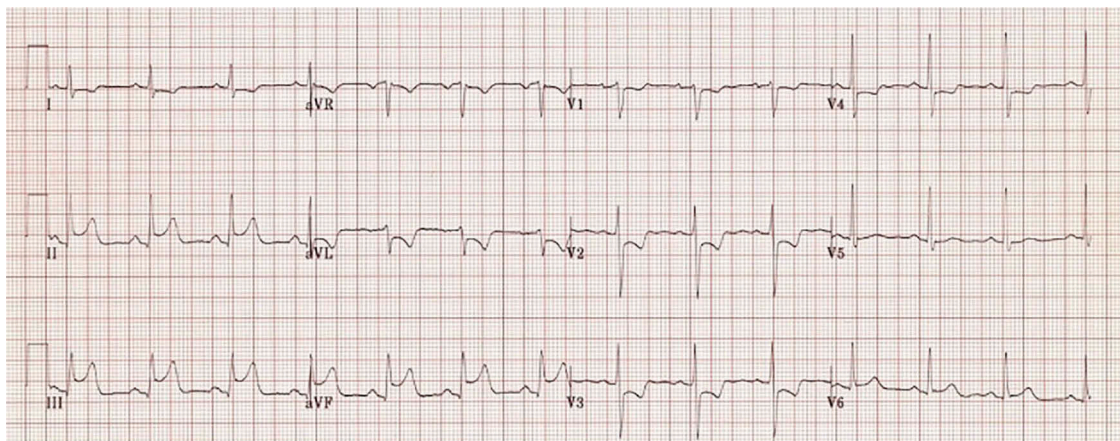


Figure 1. Electrocardiogram showed ST segment elevations in leads II, III, aVF.

rose to 62 ng/mL. Creatine kinase-MB fraction estimated 4 h after admission was 52 U/L (reference: 0–25 U/L) and rose to 95 U/L on the second day. Total immunoglobulin-E estimated on arrival was 154 IU/mL (reference: 0–100), and serum tryptase was 54.5 mg/L (reference: 5.6–13.5 mg/L). The patient was diagnosed to have Kounis syndrome type I variant, secondary to blue crab ingestion. He was treated with oral antihistamines and 8 mg of prednisolone every 6 h for 5 days. Six days later, the repeated cardiac markers were within normal limits, with resolution of electrocardiographic abnormalities and inferior wall motion echocardiographic changes. The man was discharged from hospital in excellent condition and was doing well at a 2-week follow-up visit.

Discussion

To the best of our knowledge, this is the first case of Kounis syndrome following the ingestion of blue crab. Kounis syndrome has three variants: type 1 – coronary spasm; type 2 – coronary thrombosis; type IIIa: stent thrombosis due to allergy; and type IIIb: stent

restenosis due to allergy [5]. Two specific diseases that are associated with Kounis syndrome, Anisakiasis and Scombroid syndromes have been described in the literature [6–9]. Scombroid syndrome or histamine fish poisoning is a histamine toxicity condition resulting from the consumption of spoiled fish. Scombroid syndrome cases have been encountered usually in the Mediterranean territory due to the existence of several fish species [6,7]. Anisakiasis is another condition associated with ingesting raw or undercooked fish or seafood infested with *Anisakis simplex* that is a common nematode parasitizing in fish that secretes allergenic substances [8,9].

The blue crab is found in lagoons at the Aegean and Mediterranean coast of Turkey (Figure 2). The lagoon of the Dalyan River is home to one of the Turkey's main blue crab populations. Crab is an important source of food allergen. Tropomyosin represents the main crab allergen and is responsible for IgE cross-reactivity between various species of crustaceans [10]. Recently, other new crab allergens including arginine kinase have been identified. As



Figure 2. Blue Crab image.

one of the eight major sources of food allergens proposed by the Food and Agriculture Organization of the United Nations and the World Health Organization, reports on allergic reactions induced by ingestion of shellfish including crabs are frequent, especially in coastal areas where seafood is common in the diet. In sensitized individuals, crab allergens can provoke allergic symptoms including urticaria, rhinitis, angioedema, diarrhea, asthma, and even life-threatening anaphylaxis. However, allergic myocardial infarction due to blue crab ingestion has never been reported.

Based on the clinical, laboratory, and electrocardiographic findings, the diagnosis of type I variant of Kounis syndrome induced by blue crab consumption was made in our patient. This case highlights the fact that physicians should be aware of allergic myocardial infarction. The diagnosis of this unique disease should be entertained when allergic symptoms, electrocardiographic changes, and high cardiac enzymes accompany acute-onset chest pain.

Learning points

All patients admitted to the emergency department with chest pain and ST-elevation on electrocardiography should be asked about allergic insults.

Disclosure statement

No potential conflict of interest was reported by the authors.

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