



Letter

Type I variant of Kounis syndrome secondary to wasp sting

Allergic episodes have been shown to be associated with acute coronary syndromes.¹ Human heart mast cells with their mediators are believed to be the most important cell involved in anaphylaxis,² acting on the coronary vasculature in susceptible individuals, such as patients with Hymenoptera venom allergy.

Kounis syndrome (KS) is described as “the coincidental occurrence of chest pain and allergic reactions accompanied by clinical and laboratory findings of classic angina pectoris caused by inflammatory mediators released during the allergic insult.”³ Three types of syndrome are recognized⁴: type 1 appears in patients with normal coronary arteries, type 2 occurs in patients with a preexisting atheromatous disease, and type 3 (drug-eluting stent thrombosis) occurs in patients with stent thrombosis.

A 53-year-old, previously healthy man was admitted to the emergency department of the University of Parma because of erythematous rash followed by chest discomfort 30 minutes after being stung on the neck by a wasp. His blood pressure was 110/80 mm Hg, pulse was 93/min, and oxygen saturation was 95%. Cardiac and pulmonary auscultations were normal. The symptoms rapidly evolved into a loss of consciousness with hypotension. The electrocardiogram showed ST-segment elevation in the II, III, and aVF leads and reciprocal depression in the I and aVL leads, compatible with acute inferior ischemia (Fig 1A). The patient was given aspirin 500 mg, diphenhydramine 50 mg intravenously, and methylprednisolone 120 mg intravenously. This therapy seemed to solve the symptoms, and epinephrine was not given to minimize the risk of worsening the myocardial ischemia.

In the coronary care unit he was treated with an infusion of nitroglycerin. The coronary arteriography findings were negative, but transthoracic echocardiography revealed a mild hypokinetic left ventricle involving the inferior-lateral wall and apex (ejection fraction of 48%). The patient's tryptase level was 24 $\mu\text{g/L}$ with negative cardiac enzymes.

The patient's clinical conditions gradually improved with ST-segment resolution (Fig 1B). The diagnosis of stinging insect hypersensitivity was confirmed by skin prick test with standardized venom extract (concentration of 100 $\mu\text{g/mL}$) and by intradermal test at a concentration of 0.1 $\mu\text{g/mL}$, positive for *Polistes* spp. The serum specific IgE level for *Polistes* spp was 17.8 U/mL. Skin test and serum specific IgE test results were negative for other Hymenoptera venoms.

The patient was treated with specific immunotherapy that was well tolerated, with local reactions during the buildup phase. Throughout the immunotherapy, which is still ongoing, the patient did not experience any other sting by Hymenoptera. No other skin test was performed during treatment.

Kounis syndrome should be taken into consideration in the differential diagnosis of ischemic heart disease. The pathophysio-

logic features and clinical implications of the association of acute coronary syndrome and hypersensitivity reaction are under debate. A pathogenic mechanism may include the anaphylactic reaction with hypotension due to the hypovolemic shock or the action of vasoactive, inflammatory, and thrombogenic substances released by Hymenoptera venom constituents with coronary artery spasm and subsequent cardiac injury. Because the patient's blood pressure was normal during and after the allergic reaction, we conclude that the ensued cardiac injury was not affected by coronary hypoperfusion.

The recommendation in a case of a reaction to Hymenoptera sting is to perform standard electrocardiography even if the patient does not present with preexisting coronary artery disease.⁵ Indeed, all adults and children admitted to the emergency departments for Hymenoptera sting followed by chest pain and ST elevation on electrocardiography should be investigated for the allergic pathogenesis of the symptoms. The evidence is that Kounis syndrome is not a rare disease but a rarely diagnosed disease.

Treatment guidelines for the patients with Kounis syndrome are not available, and the information about the management of this syndrome comes from individual case reports. These patients need treatment with steroids, antihistamines, fluid resuscitation, possibly epinephrine, oxygen, and antithrombotics before being transferred to the cardiac catheterization laboratory.⁶

Recently, Ridella et al⁷ reviewed the literature and demonstrated that most cases have been treated with steroids (76%), histamine₁-blockers (70%), nitroglycerin (47%), and histamine₂-blockers (35%). Epinephrine was used only in 23% of the cases. Aspirin was used in 18% of the cases.

Desensitization is the only treatment that significantly decreases the risk of life-threatening allergic reaction in the case of a further sting. In stinging insect-induced anaphylaxis, the diagnosis should be confirmed because desensitization is indicated for its high probability of success (approximately 98%).⁶ Heart failure is a commonly accepted contraindication to immunotherapy, but in these patients another anaphylaxis may be fatal. Some administered specific immunotherapy to patients with postmyocardial ventricular systolic dysfunction, without any circulatory adverse effects.⁸

Erminia Ridolo, MD*

Elisa Olivieri, MD*

Marcello Montagni, MD*

Angelo Rolli, MD†

Gianenrico E. Senna, MD‡

*Department of Clinical Sciences

†Cardiology Unit

University of Parma

Parma, Italy

Disclosures: Authors have nothing to disclose.

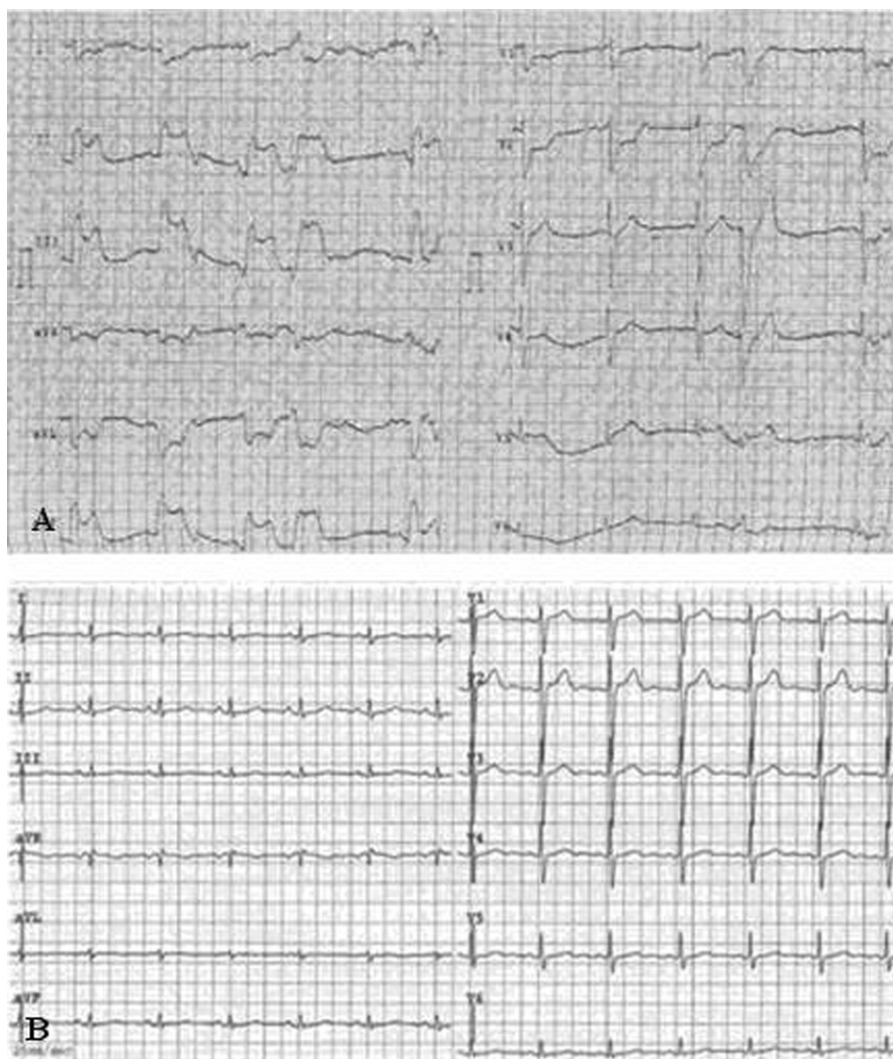


Fig. 1. (A) Electrocardiogram at the emergency department: ST-segment elevation in the II, III, and aVF leads and reciprocal depression in the I and aVL leads, which is compatible with acute inferior myocardial ischemia. (B) Electrocardiogram at discharge.

[‡]Allergy Unit
Verona General Hospital
Verona, Italy
erminia.ridolo@univr.it

References

- [1] Mueller U. Cardiovascular disease and anaphylaxis. *Curr Opin Allergy Clin Immunol*. 2007;7:337–341.
- [2] Genovese A, Rossi FW, Spadaro G, Galdiero MR, Marone G. Human cardiac mast cell in anaphylaxis. *Chem Immunol Allergy*. 2010;95:98–109.
- [3] Kounis NG, Zavras GM. Histamine-induced coronary artery spasm: the concept of allergic angina. *Br J Clin Pract*. 1991;45:121–128.
- [4] Biteker M. A new classification of Kounis syndrome. *Int J Cardiol*. 2010;145:553.
- [5] Valla M, Moulin F, Angioi M, Groben L, Sadoul N, Aliot E. Myocardial infarction in a 45-year-old man following an anaphylactic reaction to a wasp sting. *Int J Cardiol*. 2011;148:e63–e65.
- [6] Cevik C, Nugent K, Shome GP, Kounis NG. Treatment of Kounis syndrome. *Int J Cardiol*. 2010;143:223–226.
- [7] Ridella M, Bagdure S, Nugent K, Cevik C. Kounis syndrome following beta-lactam antibiotic use: review of literature. *Inflamm Allergy Drug Targets*. 2009;8:11–16.
- [8] Sobański P, Sinkiewicz W, Małyszka P, Bartuzi Z. Myocardial infarction after a wasp sting: cardiologic aspects of specific immunotherapy after allergic infarction. *Cardiol J*. 2008;15:220–225.