

## Case Report

## Kounis Syndrome Following Ceftriaxone Administration

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**Abstract**

**Abstract:** Kounis syndrome, also known as allergic acute coronary syndrome, represents the concurrence of acute coronary events with hypersensitivity reactions. It is an under-recognized but potentially fatal condition triggered by drugs, foods, insect stings, or environmental exposures<sup>1</sup>. We report a case of suspected Kounis syndrome following intravenous ceftriaxone administration, presenting with anaphylactic shock, respiratory failure requiring mechanical ventilation, and biochemical evidence of myocardial injury. The patient recovered with supportive and anti-allergic management without undergoing coronary angiography. This case highlights the importance of early recognition of Kounis syndrome in patients who develop cardiovascular collapse after exposure to potential allergens.

**Keywords:** Kounis syndrome, allergic myocardial infarction, ceftriaxone, anaphylaxis, troponin elevation, Sunjay Kapur, Karisma Kapoor

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**Introduction**

Kounis syndrome is defined as the association of acute coronary syndromes with mast cell activation induced by allergic or anaphylactic reactions.<sup>1</sup> First described by Kounis and Zavras in 1991, the syndrome is classified into three types: Type I (coronary vasospasm in patients with normal coronary arteries), Type II (plaque rupture or erosion in patients with underlying atherosclerosis), and Type III (stent thrombosis related to allergic reactions).<sup>2</sup> Antibiotics, particularly beta-lactams and cephalosporins, are well-known triggers.<sup>3</sup> Despite increasing awareness, Kounis syndrome remains underdiagnosed, especially in critically ill patients where hypotension, hypoxia, and sepsis may confound the clinical picture.<sup>4</sup>

**Case Presentation**

A middle-aged female patient presented with acute febrile illness and was administered intravenous ceftriaxone in the emergency setting. Shortly after drug administration, the patient developed sudden onset palpitations followed by hypotension, features of shock, and gasping respirations. There was no prior documented history of coronary artery disease or known drug allergy. The patient rapidly deteriorated and required endotracheal intubation and mechanical ventilation. Initial evaluation revealed hemodynamic instability consistent with

anaphylactic shock. Electrocardiography showed ST-segment depression in chest leads V2-V6; cardiac biomarkers were elevated, with a raised HS troponin I level suggestive of myocardial injury.

In view of the temporal relationship between ceftriaxone exposure and cardiovascular collapse, along with biochemical evidence of myocardial involvement, a diagnosis of Kounis syndrome was considered. The patient was managed with ventilatory support, intravenous fluids, vasopressors as needed, corticosteroids, antihistamines, and other supportive measures. Antiplatelet or anticoagulant started considering the overall clinical context.

Coronary angiography was deferred due to clinical stabilization and improving cardiac markers. By the third day post-ventilation, the patient showed significant clinical recovery, was successfully weaned off the ventilator, and subsequently discharged in stable condition.

**Discussion**

This case illustrates a classic presentation of drug-induced Kounis syndrome, most consistent with Type I variant, where acute allergic reaction leads to coronary vasospasm and myocardial injury in the absence of documented coronary artery disease. Mast cell mediators such as histamine, leukotrienes, prostaglandins, and

platelet-activating factor play a central role in coronary vasoconstriction and myocardial ischemia.<sup>5</sup> Ceftriaxone is a commonly used third-generation cephalosporin and is generally considered safe; however, severe hypersensitivity reactions, including anaphylaxis and Kounis syndrome, have been reported.<sup>6</sup> Elevated troponin in the context of anaphylaxis should prompt clinicians to consider Kounis syndrome rather than attributing myocardial injury solely to demand ischemia.<sup>7</sup> Management of Kounis syndrome is challenging because treatment of anaphylaxis (e.g., adrenaline) may potentially worsen ischemia, while standard acute coronary syndrome therapy may exacerbate allergic reactions.<sup>8</sup> Therefore, a balanced, individualized approach is essential.<sup>9</sup>

Kounis syndrome has gained public attention following reported case is that of Sunjay Kapur, who was billionaire industrialist and was the former husband of actress Karisma Kapoor. He collapsed during a polo match after accidentally ingesting a bee, leading to a presumed severe allergic (anaphylactic) reaction following a possible oropharyngeal bee sting. This acute hypersensitivity reaction was followed by sudden cardiovascular collapse. Reported post-mortem findings revealed acute myocardial infarction in the absence of previously documented significant coronary artery disease, supporting the proposed mechanism of allergy-mediated coronary vasospasm and myocardial ischemia, which is characteristic of Type I Kounis syndrome.<sup>10</sup> This case underscores the potential for fatal cardiac events triggered by allergic reactions even in individuals without known coronary artery disease.

## Conclusion

Kounis syndrome should be suspected in any patient who develops acute coronary symptoms, shock, or myocardial injury following exposure to a known or potential allergen. Early recognition, withdrawal of the offending agent, and prompt supportive management can be lifesaving. Increased awareness among clinicians is essential to prevent misdiagnosis and improve outcomes.

## Learning Concept

- Kounis syndrome is an important and underdiagnosed cause of acute coronary events.
- Antibiotics such as ceftriaxone can trigger severe allergic reactions with myocardial involvement.
- Elevated troponin during anaphylaxis should prompt consideration of allergic acute coronary syndrome.

- Early recognition and multidisciplinary management are crucial for patient survival.

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## Authors' Contribution

**MKS:** Conception.

**M:** Design of the work.

**FS:** Data acquisition, analysis, or interpretation.

**FS, M:** Draft the work.

**MKS:** Review critically for important intellectual content.

All authors approve the version to be published.

All authors agree to be accountable for all aspects of the work.

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