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Acute Non-Cardiogenic Pulmonary Edema with Cardiac Arrest Following IV Non-Ionic Contrast: Case Report

Laira Johnson

¹Department of Neurology, Germany

***Corresponding Author:**

Laira Johnson

Department of Neurology, Germany

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1. Introduction

Intravenous iodinated contrast media are widely used in diagnostic imaging, particularly in computed tomography (CT) scans. Although generally safe, these agents can occasionally trigger adverse reactions ranging from mild symptoms such as nausea, warmth, or itching to severe, life-threatening complications. Rare but serious reactions include anaphylaxis, pulmonary edema, coronary vasospasm, and cardiac arrest.

Non-cardiogenic pulmonary edema following contrast administration is an uncommon but well-documented phenomenon. Its occurrence alongside cardiopulmonary arrest is extremely rare and represents a critical emergency requiring immediate recognition and intervention. Rapid diagnosis and aggressive resuscitation are essential to improve survival.

This case describes a dramatic instance of acute non-cardiogenic pulmonary edema and subsequent cardiac arrest occurring immediately after IV administration of a non-ionic contrast agent during a routine CT examination. Despite prolonged resuscitation efforts, the patient achieved full recovery without long-term complications.

2. Case Presentation

A 77-year-old woman presented to an outpatient radiology center for a routine contrast-enhanced CT urography as follow-up for previously treated urinary bladder carcinoma. She had no prior history of contrast allergy, asthma, or significant cardiopulmonary disease, and had tolerated previous medical procedures without complications.

During the scan, the patient received 143 mL of a non-ionic iodinated contrast agent (Optiray 320) intravenously. Immediately following administration, she developed sudden and severe symptoms including nausea, vomiting, dyspnea, and a rapid decline

in general condition.

Within moments, the patient became unresponsive on the CT table. She was found to be cyanotic, pulseless, and apneic. Pink frothy secretions were noted from the mouth and nose, strongly suggesting acute pulmonary edema.

Emergency personnel were summoned immediately. Cardiopulmonary resuscitation (CPR) was initiated at the radiology suite and continued as the patient was transferred to the emergency department for advanced management.

Airway support was established with endotracheal intubation, and ventilation was maintained with 100% oxygen. Continuous suctioning was required due to copious frothy pulmonary secretions. The patient received intensive pharmacologic therapy targeting both anaphylactic reaction and pulmonary edema, including epinephrine, corticosteroids, antihistamines, glucagon, diuretics, and multiple vasopressor agents. Mechanical ventilation and hemodynamic support were maintained throughout resuscitation. Despite aggressive treatment, the patient remained in cardiopulmonary arrest with periods of pulseless electrical activity. Prolonged resuscitation efforts exceeding four hours were required before return of spontaneous circulation and partial stabilization were achieved. She was subsequently transferred to a tertiary care facility under critical care supervision.

Radiological and clinical evaluation confirmed severe acute pulmonary edema. Over the next 24 hours, the patient gradually improved and was successfully extubated. She regained full consciousness with no neurological deficits.

At follow-up more than one year later, the patient remained clinically stable, with no residual effects from the event and continued remission of her underlying malignancy.

3. Discussion

Adverse reactions to iodinated contrast media are classified as mild, moderate, or severe. Mild reactions are relatively common and self-limiting, while moderate reactions may require medical treatment such as antihistamines or corticosteroids. Severe reactions, although rare, can be fatal and include anaphylaxis, pulmonary edema, seizures, and cardiac arrest.

The incidence of severe contrast reactions is estimated to be below 0.3%. Non-cardiogenic pulmonary edema is particularly uncommon and may result from a massive systemic inflammatory response rather than primary cardiac dysfunction.

Most contrast reactions are not true IgE-mediated allergies. Instead, they are often pseudoallergic reactions caused by direct activation of mast cells and basophils, leading to the release of mediators such as histamine, leukotrienes, and prostaglandins. These substances increase capillary permeability, resulting in fluid

ANNALS OF MEDICAL AND CLINICAL CASES

leakage into pulmonary tissues and subsequent edema.

Risk factors for severe reactions include prior contrast exposure reactions, asthma, multiple allergies, cardiovascular disease, renal impairment, and advanced age. However, as demonstrated in this case, severe reactions may occur even in patients without identifiable risk factors.

Non-ionic, low-osmolar contrast agents are associated with significantly fewer adverse reactions compared to older ionic formulations, yet they are not completely risk-free. This case emphasizes that even modern contrast agents can trigger catastrophic systemic responses.

The rapid onset of respiratory distress and cardiovascular collapse in this patient suggests an acute hypersensitivity-like reaction leading to non-cardiogenic pulmonary edema and cardiac arrest. Immediate initiation of CPR, airway protection, and multi-drug resuscitation played a key role in survival.

4. Conclusion

This case highlights a rare but life-threatening complication of intravenous non-ionic contrast administration: acute non-cardiogenic pulmonary edema leading to cardiac arrest. Although such reactions are uncommon, they can occur suddenly and progress rapidly, even in patients with no prior risk factors or known allergies.

Early recognition, prompt initiation of resuscitation, and coordinated emergency management are critical for survival. Healthcare professionals involved in radiological procedures must remain alert to these rare complications and be fully prepared to manage them without delay.

While premedication strategies may reduce the risk in susceptible individuals, they do not completely eliminate the possibility of severe reactions. Continued vigilance and preparedness remain essential whenever IV contrast media are administered.

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