

Successful Resuscitation After Prolonged Cardiac Arrest in a Critically Ill Patient: A Clinical Case

Ilia Nakashidze – Dr.Med.Sc., PhD, Prof., Shota Rustaveli State University.

Shorena Potskhishvili – Shota Rustaveli State University.

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Sudden cardiac arrest (SCA) is one of the leading causes of sudden death in adults and represents a critical emergency that requires immediate resuscitative intervention. According to the World Health Organization (WHO) and various cardiology societies, approximately 4 to 6 million cases of sudden cardiac arrest are reported annually worldwide. In the United States, over 350,000 cases occur outside hospital settings (OHCA – Out-of-Hospital Cardiac Arrest) and approximately 200,000–300,000 within hospital settings (IHCA – In-Hospital Cardiac Arrest) each year. Larsen's classical study highlights that the timing of resuscitation initiation critically determines the outcome: each minute of delay without effective intervention reduces the chances of survival by 7–10%. In Europe, the average in-hospital survival rate after cardiac arrest ranges from 15–25%, depending on the underlying diagnosis, timeliness, and quality of the resuscitative care.

We present a case of a 51-year-old male with sudden cardiac arrest in Georgia, who underwent a successful 40-minute cardiopulmonary resuscitation (CPR), after which spontaneous circulation and neurological function were restored. This case is clinically significant as a rare example of successful prolonged resuscitation in a somatically compromised patient. The patient's underlying conditions included: ischemic cardiomyopathy (I25.0), dilated cardiomyopathy (I42.0), acute heart failure (I50.1), cardiogenic shock (R57.0), acute respiratory failure stage III (J96.0), chronic heart failure NYHA class IV (I50.9), arterial hypertension grade III (I10), atrial fibrillation (I48), aortic valve insufficiency (I35.1), mitral valve insufficiency (I34.0), tricuspid valve insufficiency grade I (I36.1), atherosclerosis of other arteries (I70.8), chronic venous insufficiency of the lower limbs, and gastroenteritis and colitis of unspecified etiology (A09.9).

The patient was in a critically severe condition, with significantly elevated nitrogenous waste products (creatinine 121–147–180 $\mu\text{mol/L}$; urea 9.22 mmol/L) and normal potassium levels, necessitating daily monitoring. Conservative therapy included stimulation of renal function and correction of hyperazotemia, along with strict control of electrolyte balance. Liver enzyme levels were also elevated ($\gamma\text{-GT}$ – 133.4 U/L ; AST – 127.4 U/L).

An 8.18 mg/L D-dimer level prompted further diagnostic evaluation with contrast-enhanced CT angiography of the head, chest, and abdomen. Imaging revealed a chronic occlusion of the superior mesenteric artery (SMA). Additionally, reduced bilateral pulmonary aeration and marked interstitial edema were observed. Cranial CT scans showed no evidence of acute focal brain lesions.

A vascular surgery consultation concluded that no immediate surgical intervention was required, and conservative management was initiated. The patient was transferred to the intensive care unit in extremely critical condition, requiring maximum-dose inotropic and vasopressor support to maintain hemodynamic stability.

A repeat CT scan on day 2 demonstrated no significant changes in the SMA occlusion. The clinical picture was consistent with severe systemic compromise in the context of chronic mesenteric ischemia.

Upon admission to the intensive care unit, the patient experienced defecation. The stool was foul-smelling, loose, brownish in color, and mucous in consistency, with no visible blood. An infectious disease consultation was performed, and a diagnosis of gastroenteritis and colitis of unspecified etiology (A09.9) was established. Probiotic therapy was initiated.

Within 24 hours, clinical improvement was noted, and the stool consistency changed to semi-formed.

Results:

Following intensive therapy, the patient's general condition improved. Inotropic and vasopressor support was discontinued on the 4th day. Respiratory parameters showed positive dynamics, and on the 5th day, the patient was weaned off mechanical ventilation but remained oxygen-dependent, requiring continued oxygen therapy. Nitrogenous waste products decreased over time and normalized upon transfer to the cardiology department (creatinine 121–147–180–110–79 $\mu\text{mol/L}$; urea 9.22–16.81–13.45–6.09 mmol/L); diuresis was adequate. Liver enzymes and transaminases also normalized. Neurological status improved: Glasgow Coma Scale (GCS) score was 14 (E4M6V4), pupils were round and equal (D=S), photo-corneal reflexes were preserved, the patient was conscious, responsive to commands, with intermittent signs of encephalopathy, but no focal neurological deficits.

Despite prolonged asystole and multi-organ failure (acute and chronic heart failure, cardiogenic shock, acute respiratory failure, renal and hepatic dysfunction), the patient survived. Consciousness was regained (GCS = 14), hemodynamic stability was achieved, biochemical parameters normalized, azotemia and liver enzymes decreased. After stabilization, the patient was transferred from the ICU to the cardiology department for further rehabilitation and was eventually discharged home.

The survival rate after sudden cardiac arrest generally ranges between 10–12%, and after more than 30 minutes of CPR, only 3–5%. This case represents a rare instance of successful prolonged resuscitation in the context of severe comorbidities such as dilated cardiomyopathy, NYHA class IV chronic heart failure, atrial fibrillation, valvular pathology, low ejection fraction (EF 24–26%), and multi-organ failure including respiratory, renal, and hepatic systems.

Timely emergency response and rapid hospital transportation were crucial for survival in this case. According to US and European data, only 15–25% of patients survive hospital cardiac arrest (IHCA), and favorable neurological outcomes are rare among comatose patients. Our patient had only mild encephalopathic signs (GCS = 14), which is considered relatively favorable given the extremely critical initial status.

Conclusion:

This case report demonstrates the effectiveness of intensive care after sudden cardiac arrest, cardiogenic shock and multiorgan failure in a patient with severe cardiovascular and metabolic comorbidities. Key factors for survival were immediate protocol-based resuscitation, a multidisciplinary team approach in the intensive care unit, timely recognition and treatment of organ failure, and an individualized evidence-based treatment strategy. The favorable outcome in this high-risk case highlights the importance of a systemic and multidisciplinary approach based on current clinical guidelines.

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