

## Acute Renal Dysfunction After Cardiac Surgery: a case report

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**Abstract:** Increased serum creatinine is observed in 20 to 40 percent of patients hospitalized because of heart failure. Some researchers have reported that this rise in creatinine leads to increases in hospitalization and also raises the in-hospital, and even the long-term, mortality rates of patients. In general, this morbidity, and the complications resulting from it, is still a challenge and there are different opinions about it. A 59-year-old married woman visited the heart surgery center of Golestan Hospital in Ahvaz to CABG surgery. 10 hours after surgery the creatinine level started to rise and CVP increased too. As time passed, the patient's condition became more critical and sharp increases in CVP, BUN, and Cr were observed. It was suspected the patient had developed cardiac tamponade. The medical team decided to repeat open-heart surgery because heart strain could happen. Suspecting tightness at the graft site in the heart, the surgeon changed the site of the graft to remove the pressure and the tightness and the patient's condition returned to normal 62 hours after the second surgery.

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### 1. Introduction

There is a continuous rise in heart and kidney failure cases (1) and evidence suggests that renal failure causes cardiac failure and vice versa (2). Mild to moderate increases in serum creatinine can lead to cardiovascular events and even to myocardial infarction (3). Increased serum creatinine is observed in 20 to 40 percent of patients hospitalized because of heart failure (4-5), and this rise in creatinine level is usually related to male gender, increased age, history of heart failure, chronic kidney diseases, diabetes, anemia. Researchers are trying to learn more about the mechanism of, and the epidemiological reasons for, this morbidity (6-8). Moreover, some researchers have reported that this rise in creatinine leads to increases in hospitalization and also raises the in-hospital, and even the long-term, mortality rates of patients (9-10). However, a review of other studies yields the contrary result that increased serum creatinine is not related to the stated complications and morbidities (11-12). In general, this morbidity, and the complications resulting from it, is still a challenge and there are different opinions about it. Given the importance of this issue, we can see that this increase may also happen, and of course be accompanied by complications, after CABG surgery, because it has been observed in previous studies and

researchers have used effective medicines and methods in attempting to cure it (13).

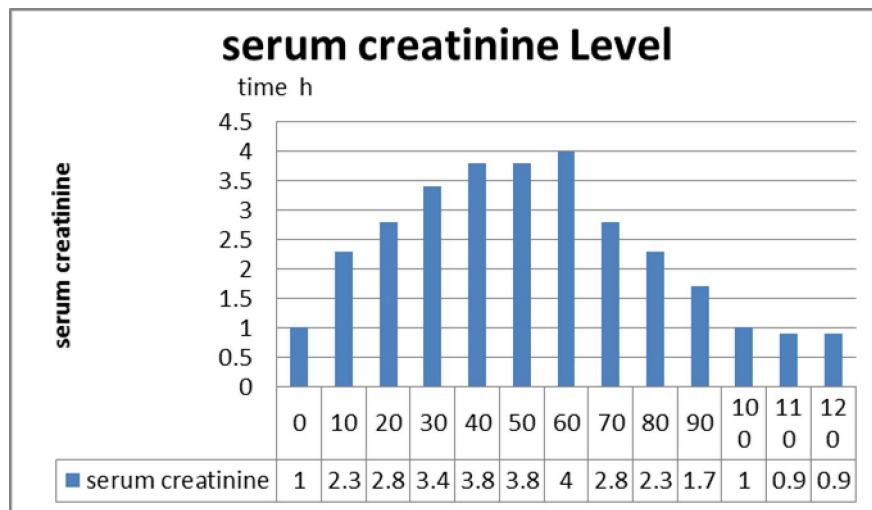
### Case report:

A 59-year-old married woman visited the heart surgery center of Golestan Hospital in Ahvaz to CABG surgery. She weighed 40 kilograms, was 164 centimeters tall, had four children, and was of elementary school level of education. Her medical history indicated she had a history of diabetes mellitus, had been hospitalized in cardiac intensive care unit, and had high blood pressure and hyperlipidemia. Moreover, tests prior to surgery showed that her EF was 50% and she had middle AVF, AVL, and LAP. Further tests revealed that her Cr level was one and her BUN level 25 (which were desirable levels). She received 0.1mg/kg intramuscular morphine and 25mg promethazine. She consumed their heart drug until the day before surgery and received intravenous prophylactic antibiotic Cephazoline 1.5g in each 8 hours until 24 hours. Analgesic drugs initiated with thiopental 2-3 mg/kg and phentanyl (3-5 mg/kg) and Atrachorim (0.5mg/kg) and midazolam (0.1mg/kg) for EKG and CVP and monitored. Circular membrane oxygenator was used. Prime solution was given with 1 liter normo-smolar ringer, 500cc glucose and one vial bicarbonate and 100cc manitol were given before surgery. Flow rate was determined such that average

blood pressure was 60-80 mmHg. In connecting to CPB, before recovery and 2 hours after surgery systolic blood pressure, diastole, heart rate, CVP, PaO<sub>2</sub>, artery pH and SaO<sub>2</sub> were measured and recorded. Blood pressure measurement was done invasively. CVP was evaluated with pressures. Blood gases including PaO<sub>2</sub>, pH and SaO<sub>2</sub> were measured. She measured for connecting membrane. When systolic blood pressure was lower than 90mmHg, Intrope was injected with 0.1-0.01ug/kg/min. additional ringer was used to maintain stable fluid level. Hemodilation was done to keep 7g/dl Hg. Myocardial monitoring with forward and backward Cardiolplagy was done with cold blood. After surgery she was transferred to ICU to sedate and prophel was injected for re-warming. In the case of homodynamic stability and pain control patient was removed from mechanical ventilation. Hemodynamic management includes keeping MAP>65 with crystalloid and Cloido-infusion Dopamine and epinephrine were injected, when necessary.

Post surgery tests showed that the BUN level was 24 and the Cr level 0.8. Moreover, ABG tests indicated normal conditions with respect to

acidosis and alkalosis, but 10 hours after surgery the creatinine level started to rise and CVP increased too. As time passed, the patient's condition became more critical and sharp increases in CVP, BUN, and Cr were observed (Table 1). The patient's consciousness level dropped. After further examination of the patient, of the tests, and of the chest X-rays, it was suspected the patient had developed cardiac tamponade. The medical team decided to repeat open-heart surgery because heart strain could happen. The surgery was repeated using the same cardiac anesthesia technique and, of course, kidney failure related to the repeat surgery was controlled. Suspecting tightness at the graft site in the heart, the surgeon changed the site of the graft to remove the pressure and the tightness. CVP decreased after this operation (17) and so did Cr (1, 7), but the patient was not in a normal condition yet and received care in the ICU. Lasix and Mannitol were administered, and Cr and BUN tests were regularly conducted. The patient's condition returned to normal 62 hours after the second surgery, and tests showed that the Cr level was 0.9, the CVP level 11, and the BUN level 24.



### Discussion:

As mentioned, increased serum creatinine is a challenging morbidity and a morbidity because researchers have different opinions about its complications during hospitalization, and in the long-term after that, complications that have not been conclusively determined yet. In discussing the complications of this morbidity, etiology and factors causing the complications must be considered too. What is important about the reported case in this article is that many epidemiologic etiologies concerning this patient conform to past data (8-10) because concurrent diseases and history of heart

failure in this patient are specified in the medical history of the patient and in the conducted tests. As was mentioned in the introduction to the case, cardiac tamponade was first suspected because of the increase in heart volume revealed in chest X-rays. Repeat surgery was then performed because there was the possibility of heart strain. This surgery proved effective. However, the important point is that, considering the mechanism and etiology discussed in this morbidity, we suggest further clinical research be carried out to obtain more information. Furthermore, we recommend clinical teams constantly monitor Cr and BUN, together with

repeated ABG tests and maximum supervision after surgery, in patients suspected of suffering from this complication, and even follow this procedure routinely in all patients who are candidates for CABG surgery, to prevent possible mortalities in case this morbidity appears.

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