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CASE REPORT

Intraoperative ST-segment elevation myocardial infarction and sudden cardiac arrest during radical cystectomy: A case report

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ABSTRACT

Perioperative acute myocardial infarction is a life-threatening event. The aim of preoperative evaluation is identifying at-risk patient of developing postoperative complications and to undertake risk reduction measures to prevent such complications. We report a case of male patient with good functional capacity and unknown history cardiovascular disease undergoing radical cystectomy who suffered intra-operative cardiac arrest and ST-segment elevation myocardial ischemia. Postoperative urgent coronary revascularization was done and dual antiplatelets therapy was prescribed. Postoperative course was uneventful with no bleeding complication. Major perioperative cardiac events in noncardiac surgery are still probable despite the current guidelines of preoperative evaluation. Early revascularization and antiplatelet administration were feasible and did not produce critical surgical bleeding.

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ST-segment elevation myocardial infarction; sudden cardiac arrest; radical cystectomy; coronary revascularization

1. Background

Perioperative acute myocardial infarction (AMI) is uncommon yet life-threatening event. The aim of preoperative evaluation is identifying at-risk patient of developing postoperative complications and to undertake risk reduction measures to prevent such complications [1]. However, the risk is not completely mitigated, and complications might still occur despite meticulous evaluation [2]. Therefore, anticipation, early diagnosis of complication and identifying the underling pathology are essential to reduce perioperative mortality.

In this report, we describe a case of intraoperative cardiac arrest secondary to ST-segment elevation myocardial infarction (STEMI) in patient with unknown history of cardiovascular disease (CVD) and good functional capacity undergoing radical cystectomy.

2. Case presentation

A 59 year-old, American Society of Anesthesiologists' (ASA) classification-II male patient (weight 67 kg and height 165 cm), was scheduled for radical cystectomy under general anesthesia. A written consent form was obtained from the patient to collect the data and publish it as a case report. The patient gave history of type 2 diabetes, hypertension, and history of smoking for 35 years. The patient gave no history of CVD nor had symptoms or signs suggestive of CVD. The patient had acceptable functional capacity (self-reported ability to climb more than two-flight of stairs [1,3]) and the preoperative electrocardiogram (ECG) showed normal sinus rhythm with no sign of myocardial ischemia. Preoperative resting transthoracic echocardiography showed grade I diastolic dysfunction, ejection fraction of 53%, and fraction shortening of 27%. Preoperative blood tests were within normal ranges except for mild anemia (hemoglobin level of 11.3 g/dL). Preoperative cardiac biomarkers were not done.

Preoperatively, standard monitors were applied (ECG, noninvasive blood pressure, pulse oximetry). Preoperative blood pressure, heart rate, and peripheral oxygen saturation were 130/80 mmHg, 83 bpm, and 98%, respectively.

General anesthesia was induced by 150 mg propofol,100 mcg fentanyl and 50 mg atracurium; maintenance agents were isoflurane 1.5% and atracurium 0.1 mg/kg every 20–30 minutes. An epidural catheter was inserted for intra and post-operative analgesia and was activated post induction.

The operation was uneventful with stable vital signs until the bladder removal, with reasonable blood loss (500 mL). After bladder removal, the ECG showed ventricular arrythmia followed by asystole. Immediately, cardiopulmonary resuscitation was commenced. The cardiac rhythm was non-shockable; then, a shockable rhythm was noted, and the patient received a DC shock 200J. Return of spontaneous circulation occurred after 20 min (10 cycles) on vasopressor support (Noradrenaline and adrenaline).

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The surgery was halted, and bilateral ureteric catheters were inserted, and the patient was referred to the intensive care unit (ICU) on vasopressor support and mechanically ventilated.

Upon arrival to the ICU, the ECG showed ST-segment elevation in leads I, aVL, V5, V6, with reciprocal depression in leads III, V1–3, and right bundle branch block. Loading aspirin 150 mg and clopidogrel 300 mg was instantly performed through a nasogastric tube, and the patient was transferred to the cardiac catheterization lab for primary percutaneous coronary intervention; occlusion of ramus intermedius was identified, balloon dilatation and stent placement (new generation drug eluting stent) were done. The patient was extubated after ICU admission and before transfer to the cardiac catheterization lab.

After coronary revascularization, dual antiplatelet therapy in addition to statins were prescribed.

The patient was weaned of the vasopressors one day after the revascularization and was discharged 5 days later to the ward without developing postoperative bleeding complication.

3. Discussion

This case describes a major intraoperative cardiac event in a patient with no history of CVD. The patient had some risk factors for CVD, namely hypertension, diabetes mellites and smoking and the surgery was a high-risk time-sensitive procedure. The patient was evaluated according to the European Society of Cardiology (ESC) guidelines and therefore, the preoperative testing included 12-lead ECG, assessment of the functional capacity. The functional capacity assessment was based on self-reported ability to climb two flights of stairs. The self-reported function capacity is an independent predictor for postoperative major cardiovascular events and mortality [3]. In addition, it is an accepted tool for preoperative assessment of functional capacity according to the 2022-ESC guidelines for cardiovascular assessment of patients undergoing non-cardiac surgery [1]. The results of the mentioned investigations suggested proceeding to surgery without further delay for any additional tests. Nevertheless, the patient developed STEMI and required immediate revascularization. The occluded coronary branch was not a major coronary branch and less likely to cause pump failure; the most likely cause of the sudden cardiac arrest in this case is the development of ischemia-induced malignant arrythmia.

Despite continuing effort for risk stratification and optimizing therapy before surgery, the risk of perioperative AMI is not eliminated. A large retrospective analysis reported that the incidence of AMI was 0.9% after major noncardiac surgery with STEMI representing 21% of all AMI events; only 24% of the patients were treated invasively, probably due to the fear from surgical bleeding [2]. Currently, there is no consensus regarding the invasive management of AMI in the perioperative period due to the challenging conflict between the risk of bleeding (due to anticoagulant and antiplatelet drugs) versus the risk of leaving the occluded coronary artery untreated [4]. The available evidence showed that the invasive management of these patients improved the survival [2]. There are limited data for the effect of administration of dual antiplatelets therapy and anticoagulation on the risk of bleeding in the early postoperative period; however, data from other contexts suggests low risk of serious bleeding such as coronary artery bypass surgery in patients receiving dual antiplatelet therapy [5] as well as patients undergoing vascular surgery receiving heparin [4]. In the current case, a multidisciplinary decision involved the surgeon, intensivist and cardiologist; the surgical team was confident regarding surgical hemostasis; therefore, the final decision favored revascularization. The postoperative course was uneventful without postoperative bleeding complication.

In the current case, despite the meticulous perioperative management and stable intraoperative hemodynamic profile, the patient developed STEMI. This could be explained by the presence of inevitable risk factors such as surgical stress-induced pro-inflammatory and hypercoagulable states in addition to the patient-related factors [1]. Therefore, the anesthetist should be alert that the risk of cardiovascular complications is still present even when the preoperative assessment followed the current guidelines.

4. Conclusion

Major perioperative cardiac events in noncardiac surgery are still probable despite the current guidelines of preoperative evaluation. Early revascularization and antiplatelet administration was feasible and did not produce critical surgical bleeding

Disclosure statement

No potential conflict of interest was reported by the author(s).

Ethics approval and consent to participate

Not applicable.

Consent for publication

We had obtained the consent to publish from the patient.

Competing interests

The authors declare that they have no competing interests.

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