

# Postoperative care of the adult cardiac surgical patient

Patrick Markey

Palanikumar Saravanan

## Abstract

Adult cardiac surgical patients are managed by standardized protocols after surgery. For most of the patients this is an extended recovery period following elective major surgery, and communication is crucial in the management of early postoperative period. Some patients are critically ill before surgery and undergo complex and emergency cardiac procedures. These patients are more likely to experience complications such as bleeding, cardiac tamponade, arrhythmias, infection, stroke, gut failure and renal failure. Some of these complications are life threatening and early diagnosis and treatment is essential. Near patient tests and transoesophageal echocardiography facilitate early diagnosis of bleeding and tamponade. Patients with renal or neurological dysfunction need to be managed in general intensive care unit. Cardiac advanced life support follows different algorithms for cardio pulmonary resuscitation in the event of cardiac arrest because of the unique nature of the aetiology and facilities available. Advanced cardiac support in the form of mechanical devices such as intra-aortic balloon pump and ventricular assist devices is available for patient management.

**Keywords** Bleeding; cardiac; cardiac intensive care; postoperative care; tamponade

**Royal College of Anaesthetists CPD Matrix:** 2A07, 3G00

Postoperative care of the adult cardiac surgical patients occurs in cardiac surgical unit (CSU) or cardiac intensive care unit (CITU). The range of patients cared for in the unit is extensive, from the otherwise well patient undergoing a straightforward coronary artery bypass graft (CABG) surgery to the emergency patient who is moribund requiring complex cardiac surgery. The cardiac intensive care unit functions both as an extended recovery unit with a high turnover of major surgical patients and an intensive care unit caring for the patients who develop the sequelae of extended stays and emergency admissions with multiorgan failure.

**Patrick Markey MBChB FRCA** is Specialty Trainee in Anaesthesia at Lancashire Cardiac Centre, Blackpool Teaching Hospitals, Lancashire, UK. Conflict of Interests: none declared.

**Palanikumar Saravanan MBBS FRCA FICM** is a Consultant Cardiothoracic Anaesthetist at Lancashire Cardiac Centre, Blackpool Teaching Hospitals, Lancashire, UK. Conflict of Interests: none declared.

## Learning objectives

After reading this article, you should be able to:

- describe the immediate postoperative care of the cardiac patient
- identify, monitor, assess and treat bleeding
- identify and manage cardiac tamponade
- provide anaesthesia for emergency reopening on CICU
- recognize cardiac specific complications such as Low Cardiac output, Arrhythmias and pacing
- summarize the impact on the other organ systems

Unlike in a general ITU, cardiac surgical colleagues have a much greater input into the care of their patients usually making multiple daily ward rounds leading to changes in treatments. While this input is invaluable and can lead to improved outcomes, it also means different approaches to solving problems with a potential for conflicts. This highlights the need for effective communication and should be used as an opportunity to consider a broader range of treatment options and understand the intention with which they are initiated.

## Immediate postoperative care of the cardiac patients

Adult cardiac patients are managed postoperatively by combined care provided by cardiac surgeons and anaesthetists. Information on patient's comorbidities, type of procedure, unexpected problems and requirement of organ support during the procedure will contribute to planning the immediate management. Assessment of patients on arrival and at regular intervals will provide guidance to the treatment required and its response. Experienced nursing staff are empowered to undertake aspects of care independently and will seek advice of medical staff only when the patient deviates from certain protocols.

It is not unusual for postoperative cardiac patients to be extubated soon or within a couple of hours after surgery. Nurse-led extubation protocol is used if the patient arrives in the unit intubated. Immediate postoperative management is foreseen by nurses based on the instructions given by the medical staff and targets set for the vital signs and urine output. The analgesic regimen varies from spinal opiates or epidural analgesia to parenteral morphine. It also includes regular paracetamol or co-codamol. Fentanyl patches, gabapentin, OxyNorm and oxycontin are increasingly used. It is not uncommon for these patients to have epicardial pacing wires which are used in the absence of their own rhythm or as a backup. Bleeding is monitored by drainage through mediastinal, pericardial and pleural drains. A vigorous diuresis is usually expected after cardiopulmonary bypass leading to hypokalaemia and hypomagnesaemia necessitating monitoring and correction as required. Investigations performed on arrival may include full blood count, coagulation screen, urea and electrolytes and chest X-ray (CXR). Arterial blood gas analysis is performed on arrival and at regular intervals to monitor, pH, pCO<sub>2</sub>, pO<sub>2</sub>, haematocrit, lactate, bicarbonate and

electrolytes. Any arrhythmias, blood pressure fluctuations and bleeding are treated with antiarrhythmic medications, vasopressors or vasodilators and blood and blood products transfusion, respectively. Some patients may be receiving mechanical cardiac support in the form of Intra-Aortic Balloon Pump (IABP) or assist devices. Low urine output is usually treated with fluid boluses and occasionally with diuretics as indicated.

Physiotherapy and rehabilitation will commence soon after the patient is awake. Realistic goals and expectations are usually set preoperatively and are reinforced. Deep breathing exercises and incentive spirometry are encouraged. Patients usually stay in the unit for 1 or 2 days following surgery and the care is then continued in the postoperative ward. Enhanced recovery programs for cardiac patients exist in a number of cardiac units in UK, which incorporates the principles of adequate preoperative preparation, good analgesia, early physiotherapy and mobilization and early chest drain removal. This is shown to decrease hospital length of stay and increase patient satisfaction.

The complicated postoperative patients usually remain in CITU longer. They are likely to receive advanced respiratory support, inotropes, vasopressors, mechanical cardiac support or renal support depending on the complex nature of the surgery performed and intraoperative misadventures. Some of these patients may develop infective complications and multi organ failure.

### Postoperative bleeding

Bleeding is a common occurrence following cardiac surgery. A number of factors influence bleeding, including preoperative haemoglobin (Hb), coagulation profile and antiplatelet or anticoagulant medications, the type, duration and complexity of surgery, intraoperative use of antifibrinolytics and postoperative haemoglobin and patient temperature. The management of anticoagulation during surgery with heparin or other agents and availability and use of reversal agents such as protamine also influence bleeding. The required protamine dose for heparin reversal is usually calculated based upon the activated clotting time (ACT) and patient weight. Inadequate reversal of heparin will cause bleeding. In patients with heparin or protamine allergy, other agents such as bivalirudin and lepirudin are used for anticoagulation during cardiopulmonary bypass and there is no specific reversal agent available for them leading to the reliance on the body metabolism for the return of normal anticoagulation with associated increase in risk of bleeding. Longer bypass times associated with complex cardiac procedures are likely to produce abnormalities in clotting with loss of clotting factors or platelet function. In addition, the residual blood in the bypass circuit is processed through a cell saver routinely in some cardiac units which can contribute to the bleeding risk depending on the amount of blood processed.

The platelet function may be impaired in patients who have been continued on antiplatelet agents till surgery. The most commonly used antiplatelet drugs include aspirin, clopidogrel and ticagrelor. These drugs inhibit platelet function irreversibly and return of normal function can take up to 10 days. Resistance to antiplatelet drugs has been described which contribute to the variability in response to treatment. Antifibrinolytics such as

tranexamic acid and aprotinin are used commonly and are known to decrease bleeding.

Assessment of platelet function prior to surgery is becoming more and more popular especially in patients who need urgent surgery while on treatment with these agents. Platelet mapping and platelet function analyser are some of the tests available for this purpose.

### Monitoring and assessment of blood loss

Individual units may have a protocol for assessing postoperative bleeding. As a general rule, drainage greater than 500 ml in the first hour or more than 200 ml per hour for 3 hours or longer is considered to be significant. Regular and accurate charting of drainage and examination of wound sites and dressings helps to quantify blood loss. However, occult blood loss can occur if the drains become blocked or blood collects in the chest cavity. This will manifest as progressive haemodynamic instability with increase in vasopressor requirement.

Bedside tests are available to quantify the coagulation function<sup>1</sup> which include ACT, International Normalized Ratio (INR), platelet mapping or platelet function analyser, Rotem (Tem Innovations GmbH, Switzerland) and thromboelastography (TEG). CXR and transoesophageal echocardiography (TOE) will also help in identifying fluid collection in the chest cavity. Urgent blood investigations must be sent to the laboratory when the bedside tests are not available, if there is a suspicion of bleeding. The trend in Hb will help in confirming blood loss or response to transfusion. Clotting studies should include fibrinogen and a further cross match will be required if the patient has already received significant blood or blood product transfusion. ACT will highlight any residual effect of heparin while TEG or Rotem will take a little longer but will provide a wealth of information about the realtime clotting capabilities of the patient. Discussing the abnormalities identified with these tests is beyond the scope of this article but must be undertaken by someone who is familiar with their interpretation.

### Medical management

Medical management is aimed at correcting any abnormalities in clotting. The management includes the following:

- Ensure the patient is normothermic.
- Control blood pressure if the bleeding is thought to be arterial and ensure venous return is not impaired if a venous ooze is the likely culprit. Head up position and application of positive end expiratory pressure (PEEP) can be tried.
- Check ACT and correct any residual heparin effect with Protamine.
- Low functional platelet count associated with bleeding should be corrected and it is reasonable to aim for platelet count above  $100 \times 10^9$  cells/cu mm by platelet transfusion in a bleeding patient. Arginine vasopressin (DDAVP) has been tried to improve the platelet count though there is no scientific evidence to support this.
- Fibrinogen less than 2.0 mg/dL should be replaced with cryoprecipitate or fibrinogen concentrate in a bleeding patient.
- Increased INR is treated with Beriplex or Octaplex which are human prothrombin concentrates containing Factors II,

Download English Version:

<https://daneshyari.com/en/article/8609884>

Download Persian Version:

<https://daneshyari.com/article/8609884>

[Daneshyari.com](https://daneshyari.com)