

Care for post elective coronary artery bypass graft surgery



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Assessment for the care of patient with respiratory problem following
Coronary Artery Bypass Graft 3 vessels disease and Mitral Valve Repair

Introduction

This essay examines a case study of a male patient with a complex history who has undergone elective coronary artery bypass graft surgery, and suffered a number of recovery complications. Coronary artery disease is a common pathology in the Western population, perhaps due to lifestyle and dietary factors, including lack of exercise and smoking.

The case history will be examined in the light of nursing care and current theoretical knowledge, looking at the individual needs of the patient and the potential interventions which could be employed to address this patient's emergent and ongoing condition. Nursing care at any stage, critical, acute or chronic, must be an holistic process which takes into account all of the social, physiological, psychological, emotional and spiritual needs of the person. Given the critical state of this individual's health, however, some needs can be identified as more urgent than others.

The case history will demonstrate the predominant needs of this patient as those connected with his respiratory function and status, and therefore while all aspects of the case will be considered, considerable attention will be paid to his respiratory needs, treatments and potential outcomes. The focus is on nursing care, which must address the emergent clinical picture whilst considering long term, mid term and short term outcomes in a client-centred context.

Discussion

The patient, who shall be called Mr S to protect confidentiality, was admitted on June 6th for an elective coronary artery bypass graft procedure, plus a Mitral Valve Repair. According to UHC (2007) a coronary artery bypass graft (CAB or CABG) is a surgical procedure in which a healthy blood vessel is transplanted from another part of the body into the heart to replace or bypass a diseased vessel. In this case, it is the treatment of choice for the patient whose history of myocardial infarction and coronary artery disease made him a prime candidate for corrective surgery. Coronary artery disease is defined as the failure of the coronary arteries to deliver oxygen and fuels for myocardial work (Emery and Pearson, 1998). Coronary artery disease is a leading cause of myocardial infarction (Emery and Pearson, 1998).

According to STS (2007), mitral valve repair is an open heart procedure which aims to treat stenosis or regurgitation of the mitral valve, which is the “inflow valve” for the left side of the heart. In normal physiology, blood flows from the lungs, where it picks up oxygen, and into the heart through the mitral valve (STS, 2007). When it opens, the mitral valve allows blood to flow into the left ventricle, which then closes to keep blood from leaking back into the lungs when the ventricle contracts to pump blood into the systemic circulation (STS, 2007). In this case, mitral regurgitation has been diagnosed, which is probably consequential to Mr S’s ischaemic heart disease (Emery and Pearson, 1998).

The patient history includes the following: post lateral MI treated with thrombolysis; shortness of breath on exertion; treatment with GTN;

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hypertensive disease; raised cholesterol; smoker (80-100 cigarettes a day, stopped smoking in 2000); umbilical hernia repair; removal of a benign growth on the thyroid gland; left ankle oedema; distal varicosities to the left extremity. Mr S is allergic to penicillin, overweight at 115kg and has been treated for the health consequences of his lifestyle for some time.

Mr S underwent the procedure as planned, with the standard postoperative care. On return to the ward from theatre he was initially on synchronized intermittent mandatory ventilation, which is a system that was developed as a method of partial ventilatory support to facilitate liberation from mechanical ventilation (CCM, 2007). In this system, a demand valve is located within the system through which patients can take spontaneous breaths, without having to breathe through the ventilator apparatus, allowing the patient to breathe spontaneously while also receiving mandatory breaths (CCM, 2007). As the patient's respiratory function improves, the number of mandatory breaths is decreased, until the patient is breathing unassisted on continuous positive airways pressure (CCM, 2007). Non invasive forms of ventilatory support have been found to be associated with improved patient outcomes (Peter et al, 2002), in a range of acute respiratory conditions including acute respiratory failure.

Mr S was extubated after ten hours, placed on high flow oxygen via face mask at 50%, but PAO₂ was only 7 with quiet lung bases on auscultation, leading to the introduction of WCPAP, with a PEEP of 7.5. He was coughing but not expectorating, and developed a number of other postoperative complications which are listed below.

- His CVP was on 24mmhg and stable within that range.
- Blood Pressure went down to 80/50 mmHg, treated with gelofusion with no response.
- noradrenaline was started 07mic/kg/min
- Frusemide 20mg /hr with good effect; on the second day urine output tailed off to 60-70ml/hr so the frusemide was increased in 40mg/hr with good effect. Urine output increased to a rate of 120-150mls/hr.
- Mr S has 3 chest drains: mediastinal, pleural and pericardial .
- Mr S is ventricularly paced at around 90 beats, with an underlying bradycardia of 44 beats /min.
- Blood results: urea was 4. 4 on the first day, 8. 3 day two post-op; creatinine was initially 102, then 164, and on the third day it was 280.
- Noradrenaline was used, followed by some attempt to wean MR S of this level of support, but the MAP was not stable and could not be kept at 70, and so noradrenaline recommenced.
- Plans for discharge were postponed due to the WCPAP, the renal complications and the blood pressure issues.
- Mr S was had an Epidural with plain levopivocaine at 5mls per hour increased to 8 mls because of pain on movement; in addition to this he had a PCA (which was being used minimally), and regular Cocodamol.

As can be seen, Mr S's condition is quite serious with a range of complications from the surgery related to his postoperative recovery. Given that cardiac surgery has been performed and there are issues with

maintaining blood pressure and cardiac rhythm, the two appear to be connected. Low cardiac output due to arrhythmias are of some concern, and so all observations should be closely monitored. The area of concern for this essay, however, is the area of the respiratory complications, but brief mention will be made of the nursing considerations of the other aspects of his condition

Nursing care focusing on his pain relief should include regular pain management, assessment of pain scores and sedation levels, and hourly pump checks on the epidural infusion and the PCA. These should be documented contemporaneously and comprehensively, and this information should be used for ongoing care planning, evaluation and communication with colleagues.

Monitoring of intravenous infusions should include checking the IV site and cannula for patency or any signs of inflammation, checking that all the infusion lines are connected, and the pumps are set at the correct rate. Fluid balance should be recorded on the appropriate chart at the appropriate hourly intervals. The colour and consistency of the urine should also be noted. Fluid management is important in respiratory disease because excess fluid intake is prone to leak through the capillary membranes into the lung tissues (Peters, 1998). Vital observations should be recorded as specified by the medical and cardiothoracic teams. Pressure area care should be carried out, nutritional status should be monitored, and responses to medications noted. All medications should be administered as charted.

Further to this, the chest drains must be observed, insertion sites assessed for signs of infection, and temperature monitored for signs of systemic responses to infection. The drain contents must be included in the fluid balance measurements, and must also be reported to the doctors, and observed for signs of haemorrhage. The drains must be kept off the floor but below the level of insertion of the tubing, to prevent the contents tracking back up towards the body, which would increase the risk of infection. For this reason, if Mr S is moved at any time or repositioned, or during procedures such as bedmaking and attending to hygiene needs, the tubing of all three drains should be clamped for the duration of the activity and then unclamped again afterwards.

In addition to this, Mr S appears to need considerable respiratory support. The literature shows that satisfactory oxygenation can generally be achieved in most patients by the use of continuous positive end expiratory pressure (PEEP) using a continuous positive airway pressure (CPAP) mask with a PEEP valve of 5-10 cm of water. However, it has become apparent that Mr S cannot be safely weaned from this as yet. One option to consider would be NPPV, which is a treatment which has evolved from CPAP (Peters, 1998). It has been found to be very effective in providing ventilatory support for patients with respiratory disorders, particularly long term and in the home setting (Peters, 1998). This might be one option which could support Mr S in being discharged from the intensive care facility.

Positioning and physical support to maintain this are also important (Peters, 1998). Therefore, Mr S should be nursed upright or semi-upright, well supported by pillows, but giving due consideration to pressure area care.
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Thorens et al (1995) suggest that the quality of nursing seems to be a measurable and important factor in the weaning from mechanical ventilation of patients with chronic obstructive pulmonary disease. While Mr S's condition is not COPD, many aspects of his symptoms and, obviously, the environment in which he is being nursed, are similar to those described in this study by Thorens et al (1995). They suggest that below a threshold in the available workforce of ICU nurses, the weaning duration of patients from ventilation and other forms of mechanical ventilatory support increases dramatically (Thorens et al, 1995). Therefore, very close attention should be given to the education and number of ICU nurses (Thorens et al, 1995), which in this instance could be viewed from a managerial point of view, in ensuring that the appropriately skilled and experienced nurses are those allocated to the care of Mr S, and that his case should be seen as a priority.

Addressing Mr S's emotional and psychological needs are also important. While it is an extremely invasive and potentially life threatening procedure, coronary artery bypass graft surgery and mitral valve repair surgery are associated with positive patient outcomes (Moshkovitz et al, 1993). This was also an elective rather than an emergency procedure. This may mean that Mr S was not necessarily expecting such a problematic recovery period and so will need support adjusting to this. The same could be said for his family and carers, who would perhaps be somewhat shocked to find him still in a relatively serious condition. The support mechanisms available to him should be assessed, and it should be factored into the nursing care plan that time (often the most precious resource available to nurses) is allocated to him to ensure that he has ample opportunity to communicate with the staff.

Communication difficulties may be associated with his condition, state of mind, level of consciousness and the use of CPAP, and these must be taken into consideration.

Wong et al (1999) discuss risk factors of delayed extubation and prolonged intensive care unit length of stay, which suggest that such occurrences are associated with higher levels of morbidity and longer periods of recovery. Whether this is due to the nature of the underlying condition, or the nature of the environment (or both), cannot be determined. However, it would appear that it is in Mr S's best interests to be facilitated towards a level of wellness along the illness-wellness spectrum that is sufficient to warrant his discharge from the intensive care unit. It might be appropriate to consider different medication regimes, or to allow the physiological systems of his body more time to adjust to his postoperative recovering state.

Another potential action might be to remove the epidural and encourage Mr S to use the PCA more appropriately, to support his pain control as a self-managed phenomenon, and to encourage a move towards increased independence, mobility and generally improved health. There is a degree of motor block evident from the epidural. Epidurals are also associated with low blood pressure, so this might be a factor in Mr S's condition. The epidural would need to be removed under aseptic technique, and a small dressing placed over the site. The tip of the epidural catheter must be checked to make sure it is complete, and this noted in the patient's records. Close monitoring of the patient's blood pressure following this might allow the nurse to assess whether this has had a positive effect on Mr S's blood pressure.

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Similarly, if Mr S is more mobile and able to move a little more independently, this might increase cardiac output and improve blood pressure. He is at considerable risk of post-operative thrombosis, in particular deep vein thrombosis and pulmonary embolism, and so mobilisation will be a key factor in his recovery and in preventing these complications. Hannan et al (2003) found that post-operative recovery from coronary artery bypass graft surgery can be adversely effected if the patient suffers from 6 or more comorbidities. Given his medical history, it is unsurprising that Mr S finds himself not recovering as quickly as potentially possible, and so it is important to maximise all opportunities to promote recovery and health. The use of low molecular weight heparin as a prophylaxis against deep venous thrombosis and pulmonary embolism is common in post-operative care, and is likely to be used here. However, there is a serious consequence of anti-coagulant therapy, which is the increased risk of haemorrhage, and so this again will need to be monitored for very carefully.

Stanley et al (2002) suggest that neurocognitive decline is a continuing source of morbidity after cardiac surgery. This may be associated with cardiac arrhythmias (Stanley et al, 2002). Mr S's underlying bradycardia may then be a contributory factor in his long-term prognosis and this is why such intensive cardio-pulmonary support is warranted. Neurocognitive dysfunction is common after coronary artery bypass graft surgery (Stanley et a, 2002), and so assessments of this should form part of the ongoing care and monitoring of his condition. The pacemaker will also be monitored for functionality, and heart rhythm observed. Any changes will be assessed by

the cardiothoracic team and any improvements towards normal rhythm noted.

It is also important for nurses to consider multidisciplinary team input as a part of interprofessional working and client-centred care. For example, some research has demonstrated that a multidisciplinary approach to weaning from mechanical ventilation has been associated with greatly improved outcomes in the short and long term (Smyrnios et al, 2002). Mr S, given his condition, would be a prime candidate for pulmonary physiotherapy, which has been argued by some to be useful in the recovery process. Given the respiratory assessment findings, this may be used. However, the usefulness of respiratory physiotherapy for the prevention of pulmonary complications after cardiac surgery remains unproved (Pasquina et al, 2003). Therefore it would need to be a collaborative decision in conjunction with the consultant in charge of Mr S's case.

Conclusion

This examination of Mr S's case and history has demonstrated that he is suffering from a number of post operative complications associated with his surgical status, his past medical history and the range of comorbidities he is suffering. The diagnosis of his current condition must remain the area of responsibility of the doctors who are in charge of his case. However, nursing interventions are a vital component of his care and potential for recovery. While doctors may diagnose and prescribe, it is the nursing staff who assess, monitor, administer therapies, and engage in the majority of prophylactic activities to support optimal return to wellness.

This essay has also considered the need for an holistic approach to Mr S, viewing him as a person in the context of his own life rather than simply a set of conditions which much be treated and hopefully, resolved. However, the nature of his condition is serious, and until the cardiac and respiratory function issues are resolved, there is very little that can be done other than to support him and his body systems to continue to function, whilst engaging in nursing activities aimed at minimising further complications from his continued dependent and unwell state. There are a number of actions that can be taken, including pressure area care, fluid management, engagement with the multidisciplinary team, and pain management, all of which can contribute to supportive a positive prognosis for Mr S. However, he continues to require intensive nursing care until such time as he is able to be weaned off the CPAP and the noradrenaline which is helping to maintain the blood pressure. Until that time, all his needs will continue to be met by 24 hour intensive nursing care.

References

CCM (2007)<http://www.ccmtutorials.com/rs/mv/page7.htm>

Emery, C. and Pearson, S. (1998) Managing coronary artery disease. In:

Shuldham, C. (1998) *Cardiorespiratory Nursing* Cheltenham: Stanley Thornes.

Hannan, E. L., Racz, M. J., Walford, G. et al (2003) Predictors of Readmission for Complications of Coronary Artery Bypass Graft Surgery *JAMA*. 290 773-780.

<https://assignbuster.com/care-for-post-elective-coronary-artery-bypass-graft-surgery/>

Moschovitz, Y., Lusky, A. and Mohr, R. (1995) Coronary artery bypass without cardiopulmonary bypass: analysis of short-term and mid-term outcome in 220 patients. *Thoracic and Cardiovascular Surgery* 110: 979-987.

Pasquina, P., Tramer, M. R. and Walder, B. (2003) Prophylactic respiratory physiotherapy after cardiac surgery: systematic review *British Medical Journal* 327: 1379

Peter, J. V., Moran, J. L., Phillips-Hughes, J. and Warn, D. (2002) Noninvasive ventilation in acute respiratory failure- A meta-analysis update. *Critical Care Medicine* . 30(3) 555-562.

Peters: R. (1998) Respiratory failure: Adult Respiratory Distress Syndrome In: Shuldham, C. (1998) *Cardiorespiratory Nursing* Cheltenham: Stanley Thornes.

Shuldham, C. (1998) *Cardiorespiratory Nursing* Cheltenham: Stanley Thornes.

Smyrniotis, N. A., Connolly, A., Wilson, M. M. et al (2002) Effects of a multifaceted, multidisciplinary, hospital-wide quality improvement program on weaning from mechanical ventilation. *Critical Care Medicine*. 30(6) 1224-1230.

Stanley, T. O., Mackensen, G. B., Brocott, H. P. et al (2002) The Impact of Postoperative Atrial Fibrillation on Neurocognitive Outcome After Coronary Artery Bypass Graft Surgery. *Anesthesia and Analgesia* 94 290-295.

STS (2007) <http://www.sts.org/doc/410> Accessed 28-6-07

<https://assignbuster.com/care-for-post-elective-coronary-artery-bypass-graft-surgery/>

Thorens, J. B., Kaelin, R. M., Rainer, M. et al (1995) Influence of the quality of nursing on the duration of weaning from mechanical ventilation in patients with chronic obstructive pulmonary disease. *Critical Care Medicine* . 23(11) 1807-1815.

UHC (2007) <http://healthcare.utah.edu/healthinfo/adult/cardiac/glossary.htm> Accessed 28-6-07

Wong, D. T., Davy, C., Kustra, R. et al (1999) Risk Factors of Delayed Extubation, Prolonged Length of Stay in the Intensive Care Unit, and Mortality in Patients Undergoing Coronary Artery Bypass Graft with Fast-track Cardiac Anesthesia: A New Cardiac Risk Score. *Anesthesiology* . 91(4) 936.

Woods, S. L, Froelicher, E. S. S. and Motzer, S. U. (2000) *Cardiac Nursing* Philadelphia: Lippincott.