

Coronary artery bypass graft surgery essay sample



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Introduction

According to American Heart Association, a “ Coronary artery bypass graft (CABG) surgery” is a form of heart surgery that redirects blood around clogged arteries to increase blood flow and oxygen to the heart. During CABG surgery the surgeon uses a portion of a healthy vessel (either an artery or vein) from the leg, chest, or arm to create a bypass around the clogged artery (Andrew & Kanu 2002). They also added that “ CABG surgery with cardiopulmonary bypass a heart-lung machine artificially maintains blood circulation and oxygenation while the surgeon operates on the heart.” The Patients typically receive 1 to 5 bypasses per operation depending on how many coronary arteries and their main branches are blocked. Sharon Parmet (2004) explain that many patients can go home three to six days after surgery; however it may take an additional four to six weeks for the patient to feel stronger and resume his/her normal activities.

CABG Statistics

Based on the research of American Heart Organization (2005) on Heart Disease and Stroke Statistics “ An estimated 515, 000 procedures were conducted in 306, 000 patients in 2002. Of the estimated 306, 000 patients receiving CABG surgery in the United States in 2002, 219, 000 (72 percent) were men, 166, 000 (54 percent) were aged 65 or older, 125, 000 (41 percent) were from the southern United States” and about 10 percent of patients with CAD will undergo CABG surgery (Andrew & Kanu 2002).

Before the Procedure

Cynthia G. Segal & Jacqueline J. Anderson (2002) reveal that cardiovascular surgeons at the hospital practiced various methods of preoperative skin preparation before performing open heart surgery.

Excerpted from Robert Wood Johnson University Hospital (2007):

1. The physician will explain the procedure to the patient and offer opportunity to ask questions regarding the procedure. The consent form will be presented to the patient and signed as permission to do the test. After knowing the medical history the physician performs a complete examination, by undergoing blood tests and other diagnostic tests to make sure that the patient is in good health before the operation.
2. Fasting for eight hours before the procedure, usually after midnight.
3. Notify the physician if the patient is suspected pregnant, allergies to any medications, iodine, latex, tape, or anesthetic agents. If taking herbal supplements the physician should know.
4. Avoid taking aspirin or any anticoagulant medications. For patients with bleeding history and have a pacemaker the physician must be notified and the physician will request a blood test to determine how long it takes your blood to clot prior to the procedure.
5. The patient who smokes should stop immediately prior to the procedure. For fast recovery and benefit the overall health status.
6. In the morning of surgery, a trained patient care assistant clipped patients' hair in their rooms (Robert et al 724-747) before the operation.

7. All patients received a prophylactic preoperative antibiotic (ie, cefuroxime), or if they had a documented allergy to penicillin, they received vancomycin in the appropriate dosing window to provide adequate coverage at the time of incision.(Howard, n/d).

During the Procedure

8. An intravenous (IV) line will be started in the arms or hand. Additional catheters will be inserted in the neck and wrist to monitor the status of the heart and blood pressure and for obtaining blood samples. Then positioning in the operating table, lying back.
9. The anesthesiologist will continuously monitor your heart rate, blood pressure, breathing, and blood oxygen level during the surgery. Once you are sedated, a breathing tube will be inserted through your throat into your lungs and you will be connected to a ventilator, which will breathe for you during the surgery. (Kaplan, 1979).
10. “ After general anesthesia is administered, the surgeon removes the veins or prepares the arteries for grafting. If the saphenous vein is to be used for the graft, a series of incisions are made in the patient’s thigh or calf. If the radial artery is to be used for the graft, incisions are made in the patient’s forearm. It is important to note that the removal of veins or arteries for grafting does not deprive the area of adequate blood flow.” (Senagore, Anthony & Thomson Gale, 2004)
11. As vein is removed from the leg by a physician assistant; the surgeon simultaneously opens the chest by dividing the breast bone or sternum, affording excellent exposure of the heart (see Figure 1). An artery behind the sternum, “ the left internal mammary artery” (LIMA)

is taken down and one end prepared for bypass grafting (see Figure 2). Tubes or cannulae are inserted into the heart and major blood vessels surrounding the heart in preparation for cardiopulmonary bypass with the heart-lung machine.

(Senagore, Anthony & Thomson Gale 2004)

Figure 1: Anatomy after sternotomy

Figure2: Preparation of LIMA

University of Rochester Medical Center point out that “ Traditionally, the heart is stopped during the CABG process. The patient is kept alive by a heart-lung machine during the operation. This is known as cardiopulmonary bypass.” Senagore & Gale (2004)

12. At this point, the patient is placed on the heart-lung machine. Blood is re-directed from the heart into the heart-lung machine. This permits the surgeon to safely operate on the heart without blood pumping through it. The heart is then stopped, and the heart-lung machine continues to pump freshly oxygenated blood to the rest of the body, in effect, taking over the roles of the heart and lungs. (Mid-Atlantic Surgical Associates)
13. After the above have done, each target vessel is identified as it runs across the surface of the heart. For each intended bypass, the surgeon makes a tiny opening into the front wall of the target coronary artery with a very fine knife. The opening is expanded with specialized scissors. (Levinson of Heart Surgery Forum)
14. The open ends of the saphenous veins and LIMA are now sewn to the openings in the coronary arteries using very fine non-absorbable

suture material; these are called the “ distal” anastomoses (see Figures 3, 4 and 5). Surgeons wear special magnifying lenses in order to see the delicate suture and small vessels. (Mid-Atlantic Surgical Associates)

Figure 3: Opening into Coronary Artery

Figure 4: Suturing distal

anastomosis of

Saphenous vein graft

Figure 5: suturing distal anastomosis of LIMA

15. As soon as the LIMA anastomosis is completed, blood flow is established to that region of the heart. A vein graft however, is harvested as a “ free graft” and has no “ inflow” ... therefore, after the “ distal” vein graft anastomosis is constructed, the other end of the vein graft is sewn to the aorta (the main artery leaving the heart) in order to establish “ inflow”. These are called the “ proximal” anastomoses. After this stage, blood flow has now been established beyond all the blocked arteries, and the heart has effectively been “ bypassed” (Mid-Atlantic Surgical Associates).

16. If the procedure was done “ on-pump,” electric shocks start the heart pumping again after the grafts have been completed. The heart-lung machine is turned off and the blood slowly returns to normal body temperature. After implanting pacing wires and inserting a chest tube to drain fluid, the surgeon closes the chest cavity. Sometimes a temporary pacemaker is attached to the pacing wires to regulate the heart rhythm until the patient’s condition improves. After surgery, the

patient is transferred to an “ intensive care unit” for close monitoring. (Senagore & Thomson 2004).

After the Procedure

Gail Hendrickson (2006) researched that after surgery, the person is taken right away to the “ intensive care unit”, or ICU. He or she will be given medication for the first few hours to make him or her sleep. He added that patients has an attached a breathing tube, called an “ endotracheal tube”, down the windpipe. This tube is attached to a “ ventilator”, or artificial breathing machine, to ensure deep breaths and to make it easier for the person to breath. This will be removed when he or she is awake, and able to take deep breaths. A “ stomach tube”, called a nasogastric tube, in the nose to drain the stomach and prevent nausea and stomach swelling a narrow tube, called a “ urinary catheter”, in the bladder to measure the amount of the urine the body is making. One or two tubes in the chest also attach to prevent fluid build-up, many “ intravenous, or IV, lines” to give fluids and blood as needed, a small tube in the wrist to monitor blood pressure closely and a tube in the neck to monitor how well the heart is pumping and to allow an easy, painless way to draw blood.

Statistics Rate of Mortality after the CABG

Table 1. Frequencies for Development Sample, Cross-Validation Sample, and Full Data Set

<u>Development</u>	<u>Cross-Validation</u>	<u>Full Data</u>
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In-hospital mortality

Number of cases	6, 680	6, 679	
13, 359			

Number of in-hospital deaths	142	122	264
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Mortality rate	2. 1	1. 8	2. 0
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30-day post-surgical mortality

Number of cases	6, 088	6, 087	12, 175
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Number of deaths within 30 days	131	150	281
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Mortality rate	2. 2	2. 5	2. 3
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7-day readmissions

Number of cases	5, 969	5, 968	11, 937
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Number of readmissions within 7 days	306	316	622
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Readmissions rate	5. 1	5. 3	5. 2
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30-day readmissions

Number of cases	5, 969	5, 968	11, 937
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Number of readmissions within 30 days	769	807	
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1, 576

Readmissions rate	12. 9	13. 5
13. 2		

In-hospital mortality is affected by the pre-operative severity of illness of CABG surgery patients, as well as by the quality of surgery and hospital care patients receive as indicated by New Jersey Department of Health and Senior Services (1999). Consequently, if some hospitals treat sicker patients, they will have higher mortality rates even if their quality of care is comparable to hospitals with patients who are not as sick. Thus, it is important to try to adjust for differences in patient severity of illness when reporting outcomes.

Conclusion

All CABG procedures have certain risks and certain advantages. Your own situation, as well as your doctor's preferences, may guide him or her to one or the other. The Department of health implied the data should not be used as the sole factor in making choices about providers but should be a part of the discussion between cardiac surgery patients and their referring physician. Thus, the data provided in this report should be viewed only as one of the factors to consider in selecting a surgeon and hospital. The Department believes that the patient and physician together can make the best choice after full consideration of that patient's medical needs.

CABG is one of the effective ways in undergoing alternative by many patients who has a heart problem. The survival rate is increasing with the new technology and the correct procedures set the hospital and surgeons

from the preparation down to the actual operations and after the operations to enhance successful process and complications.

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