Healthy Heart

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***From the desk of editor:***

Coronary artery bypass surgery (CABG) is the most commonly performed operation in the world today. Even though the operation is very much routine today, it still constitutes major surgery with significant mortality and morbidity. In this review, we try to cover the most common postoperative problems that can occur in this patient group after discharge, i.e what the physicians & general practitioner will be consulted with, even if initially. **– Dr. Dhiren Shah**

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**Cardiac surgery and the general practitioner: A practical guide to postoperative problems**

Just as in any other medical speciality, history and a well conducted directed examination are the key to accurate diagnosis post cardiac surgery.

**Taking history of a patient post cardiac surgery - The 10 point history**

* What operation h as the patient undergone?
* When was the operation performed on the patient?
* Was the operation an emergency?
* How long was the total and postoperative hospital stay? (Usually 5 to 10 days)
* Preoperatively, what was the cardiorespiratory state of the patient?
* How well was the patient on hospital discharge?
* Was the patient specifically warned about any symptoms or signs?
* What medications were the patient given upon discharge?
* What is the specific complaint of the patient?
* Any specific complaints about sweats,temperature, shortness of breath, cough,pain, weeping wounds and ankle swelling?

**Examining a patient post cardiac surgery – The 10 point examination**

* Does the patient look well?
* Is the patient short of breath?
* Cold hands and feet indicate poor cardiac output.
* Warm hands and a bounding pulse indicate sepsis.
* Examine wounds-sternal, leg, arm, and neck
* Is ankle oedema present?
* Is jugular venous pressure (JVP) raised?
* Listen to heart sinus, fast atrial fibrillation (AF), and murmurs. Don't rely on radial artery for heart rate.
* Listen to lungs wheeze, infection, effusion, atelectasis
* Is epigastrium tender? Gastritis

**Auscultation of the heart post cardiac surgery**

The heart sounds of patients who have had a CABG are commonly normal; however a 3rd heart sound may be heard with left ventricular failure. Mitral regurgitation may be heard secondary to anular dilation.

In patients with tissue valves, auscultation will rarely detect an abnormality. The presence of a flow murmur should prompt an echocardiogram to evaluate outflow tract obstruction, or valvular degeneration, which occurs 5-10 years postoperatively. The presence of a regurgitant murmur should always raise the suspicion of endocarditis in the appropriate clinical scenario or valvular dehiscence. Again echocardiography and possible cardiological evaluation should be undertaken. An apyrexial patient who is well with a normal CRP (C-reactive Protein), ESR (Erythrocyte Sedimentation Rate) and WBC is unlikely to have endocarditis.

**Arrhythmias**

Any arrhythmia is possible after cardiac surgery; by far the most common cause is atrial fibrillation. The cause of this is multifactorial, and poorly understood. However, two important points need addressing. Firstly, that the patient doesn't have hypokalemia, and secondly that the patient is not hypoxic. In practical terms if the patient is eating and drinking normally, and they are not on potassium losing diuretics (eg frusemide alone), and they are not short of breath, and they have a clinically clear chest then these two causes can be eliminated.

Opinion is divided between digoxin and amiodarone. In patients who were on beta blockers pre operatively that have been stopped post operatively some reintroduce the beta blockers, albeit at half the previous dose. Sotalol is the preferred beta blocker of choice in most cardiac surgical units.

**Wound infections**

Minor leg wound infections are relatively common (1-10 % of cases) with severe infections of the leg and sternum being relatively uncommon <1%. Excessive wound inflammation, in the absence of infection needs to be recognised to avoid unnecessary antibiotics. Staphaureus remains the most common organism involved, hence the usage of flucloxacillin, or erythromycin in penicillin allergy patients. It is important to ensure that no puss is situated deep in the wound. Any suspicion of deep seated pus needs drainage as antibiotics are unsuccessful in this situation. In assessing sternal wounds sternal stability needs to be assessed. Any evidence of instability may herald mediastinitis and is a reason for referral back to the cardiac surgical unit.

**Pleural effusions**

Pleural effusions, are very common post cardiac surgery, especially left sided, secondary to opening the left pleura when harvesting the left internal mammary artery (LIMA). Small effusions should be left to self resolve, larger ones should be either aspirated or have a chest drain inserted. The decision to drain an effusion depends on the respiratory state of the patient; the more short of breath the lower the threshold to intervene.

**Respiratory infections**

Respiratory infections are frequent postoperatively, especially left sided. In patients who have prolonged hospital stays, pseudomonal infections become more common. Sputum cultures can be very helpful in treating failed courses of antibiotic therapy. Signs of systemic unwell should prompt referral back to hospital for intravenous antibiotic therapy and/or oxygen therapy.

**Short-of-breath patient**

Shortness of breath post cardiac surgery is a common presentation to GPs. The cause can be broken down into haematological, respiratory and cardiac. It should not be forgotten that CABG does not improve dyspnoea, and therefore a comparison with preoperative status is needed.

Anaemia is common postoperatively, and care should be taken to diagnose the patient who has developed gastrointestinal haemorrhage secondary to the aspirin they are on.

Respiratory causes of shortness of breath that are common postoperatively include pre-existing COPD (Chronic Obstructive Pulmonary Disease), chest infection, pleural effusions, and basal atelectasis in the first 10 days postoperatively. Obviously, clinical examination will help in elucidating the cause; however, a CXR (Chest X-ray) can be invaluable. The left base is the most common site of respiratory complications.

Left ventricular failure, is the most common cause of cardiac induced shortness of breath, as valvular pathology is most likely to have been corrected. ACE inhibition and diuretics remain the main stay of therapy here. Prosthetic valvular dysfunction should always be suspected, although this is rare. Occasionally, fast atrial fibrillation will present as breathlessness, with the patient having no sensation of tachycardia.

**Medications-post cardiac surgery**

This remains one of the most confusing areas for GPs post cardiac surgery, unfortunately, usually due to poor communication from the cardiac surgical unit.

1. **Maintaining graft pateency**

Aspirin is given to all patients who undergo CABG, unless they are aspirin intolerant, in which case, clopidogrel, or warfarin are utilised. Warfarin is frequently given to patients who have undergone

endarterectomies, or who are in atrial fibrillation. The risk benefit of the combination should be evaluated by the surgeon who undertook the CABG. Increasingly, aspirin is being co-prescribed with clopidogrel, due to the perceived reduction in cardiovascular events that will result in reduced cardiac morbidity & mortality. Antacids, either H2 blockers or proton pump inhibitors are given occasionally as gastric prophylaxis.

1. **Statin therapy**

All patients who were on a preoperative statin, or who are hyperlipidemic should go back on a statin postoperatively, possibly life long. Statin therapy need not be withdrawn preoperatively as the perceived risk of rhabdomyolysis seems to have been overestimated. Common side effects of statin therapy include nausea and abnormal liver function tests.

1. **Warfarin**

Warfarin is always administered to patients with mechanical heart valves, and sometimes to patients who have tissue valves, atrial fibrillation, or have undergone endarterectomies. In patients who have tissue valves, atrial fibrillation, or have undergone endarterectomies an INR (International Normalised Ratio) above 2.0, (preferably above 2.5) is necessary. With respect to mechanical valves, the surgeon will recommend a range for the INR to be in. However, mechanical valves in the aortic position should not have an INR below 2.0, and in rhe mitral position the INR should be above 2.5.

1. **Antianginal medications**

These area l l stopped postoperatively. Some surgeons utilise a nitrate for a short period postoperatively. Calcium channel blockers, usually diltiazem or amlodepine are frequently given

postoperatively to counter radial artery spasm, and not for its anti-anginal effects.

1. **Anti-hypertensive medications**

It is common for patient’s blood pressure to be low for the first few weeks postoperatively; hence the stoppage of preoperative anti-hypertensives upon hospital discharge. These invariably will need to be reintroduced at some point postoperatively. ACE inhibitors are becoming first line therapy, especially in patients with poor left ventricular function.

1. **Diuretic therapy**

Diuretic therapy is commonly given to patients post cardiac surgery. Preoperative diuretic therapy usually predicts the need for long term use. However in patients with post valve surgery, the dose can be reduced. Patients who undergo CABG are frequently put on frusemide. This is usually in patients with poor left ventricular function or those who have been on cardiopulmonary bypass – as opposed to being done off pump. The majority of patients who were not on preoperative diuretics can have them stopped at 6 weeks postoperatively (usually in their outpatients appointment).

**Radial artery**

The use of the radial artery, has recently become more common secondary to the perceived benefit of arterial revascularisation. Wound infections of the non dominant forearm are uncommon, however sensory changes in the forearm and hand are relatively common. Forearm claudication is unusual. Patients are usually treated with three months of calcium channel blockers-usually diltiazem or amlodipine.

**Methods of skin closure**

Skin is usually closed with an absorbable sutures, meaning no sutures need to be removed. A few surgeons utilise clips. The removal of the clips requires the dedicated clip remover to reduce any discomfort felt by the patient.



**Neuropsychological dysfunction and fine movements**

The use of cardiopulmonary bypass (heart lung machine) is known to affect all aspects of

cerebral and cerebellar function. This usually manifests itself as loss of concentration, reduced mental agility, memory impairment, and uncoordinated fine movements of the hands. Symptoms usually recover over the ensuing months, however recovery may be incomplete. With the introduction of off pump CABG, with no touch of the aorta, these complications may be dramatically reduced in future.

**Pericarditis**

Pericarditis post cardiac surgery, is well described but infrequent. Severe cases resulting in

Dresslers syndrome (pleural effusions and pericarditis) may require steroid treatment, however

usually a short course of a nonsteroidal is sufficient. (Localised pericarditis is a common term what probably implies a myocardial infarction, which should always be ruled out before a diagnosis of pericarditis is made).

**LIMA numbness**

Because of LIMA harvesting, there is nerve injury on chest wall, which can result in numbness of area and or hypersensitivity of variable size over the left anterior hemithorax. Sensation may not become normal in a few patients and they should be merely reassured.

**Ulnar nerve/ T1 palsy**

Spreading the chest via a median sternotomy can result in traction injuries to the brachial plexus. This manifests itself in the form of ulnar nerve / T1 neurology. which is usually the tingling/numbness along the medial border of the hand, which usually recovers spontaneously.

**Recurrent angina**

Recurrent angina occurs in 1-5 % of patients in the 1st year and up to 30 % of patients by 10 years. Patients should be reinvestigated in a standard manner, usually by a cardiologist.

**Driving, flying and foreign holidays**

These should all be avoided for at least 8 weeks assuming a smooth postoperative course. This allows the sternum to heal and the neuropsychological sequelae to improve. Medical insurance should be recommended for all foreign travel.