

Case Report

Anaesthetic Management of an Elderly Patient with Ischaemic Heart Disease and Previous MI Undergoing Elective Inguinal Hernia Repair: Case Report

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Abstract

Ischemic heart disease may occur in isolation, or in combination with the pathological process of vascular ageing, arteriosclerosis. These two conditions have differing impacts on the haemodynamic changes in response to anaesthesia and surgery. Hypertension is not a feature of ischemic heart disease, and viceversa, but where the two conditions co-exist; hypertension aggravates and accelerates the pathological processes of ischemic heart disease. Patients older than 40 yrs. presenting for anaesthesia and surgery must therefore be considered at risk of any combination of these three conditions. Anaesthetic techniques must also be chosen to minimize haemodynamic changes which in the normal healthy patient cause no serious morbidity, but which, in the patient with ischemic heart disease, can lead to serious morbidity or death.

INTRODUCTION

Patients with Ischaemic heart disease undergoing surgery, particularly those with previous myocardial infarction, are at increased risk. Several authors have documented a high incidence of myocardial ischemia during the preoperative period (42%), the day of surgery (24%–37%), and within the first 2-3 days of surgery (40%) [1-5]. Most of this ischemia is silent and unrelated to adverse hemodynamic changes such as tachycardia, hypertension, or hypotension leading to increased myocardial oxygen demand or decreased supply. Since a significant relationship between the incidence of new ischemic episodes and the occurrence of postoperative myocardial infarction has been demonstrated [1,2], the primary anaesthetic goal in managing patients with ischemic heart disease is the prevention of ischemia.

Three options are available: regional anaesthesia (with or without appropriate sedation), general anaesthesia, or a combination of both. The combination of general and regional anaesthesia may cause greater cardiovascular instability than either technique alone. These concerns apply specifically to the combination of general anaesthesia with either spinal or extradural anaesthesia for abdominal or thoracoabdominal surgery, in that the potential for arterial hypotension is greater if the sympathetic nerve supply to the pelvis and lower limbs is blocked simultaneously with that of the splanchnic area. While this may be true of a "high" spinal extending from T6 down to the sacral region, or a lumbar extradural block covering the same segmental distribution, it is not true necessarily for segmental

blockade limited to the splanchnic distribution alone (e.g. T6-T12). Experience in patients with hypertension or coronary artery disease has shown that arterial pressures may certainly be lower with combined general and regional anaesthesia than with regional anaesthesia alone [6,7], although the absolute arterial pressure can be controlled by the judicious use of volume expansion, with or without simultaneous infusion of vasopressors [8].

CASE PRESENTATION

A seventy year old, elderly male patient posted for an elective right sided inguinal hernia repair. His Pre-anaesthetic evaluation reveals that he was a known case of Hypertension on Tab. Enalapril (10 mg od) since eight years and Type 2 DM on Tab. Glimepiride (with Insulin) since nine years. Both hypertension and DM were well controlled. Patient complains of breathlessness on exertion (NYHA class II) and has a predicted METs score of ≥ 4 . There is a past history of hospital admission four years back for documented Inferior wall MI (managed conservatively) after which patient had undergone Coronary Angiography (findings: mid RCA -50% lesion, LAD/LCX Plaques) and was on Tab Metoprolol (25mg) once daily and Tab clopidogrel (75mg) once daily as secondary prophylaxis treatment.

On physical examination, Patient was well built, well-nourished with a body weight of 47 kgs., a pulse rate of 86 bpm, BP of 128/80 mmHg. Airway examination reveals adequate mouth opening (Mallampatti grade-I) with normal neck mobility and normal dentition. Spine examination was also normal.

Clinical examination of Cardiovascular and Respiratory systems was unremarkable.

Laboratory investigations included complete blood count with hemoglobin levels of 14.6g% and platelet count of 1.78 lacs/mm³. Liver function, kidney function, serum electrolytes, coagulation profile and blood sugar levels were also normal. Chest radiograph was normal and 12-lead ECG showed normal sinus rhythm and no significant ST/T wave changes. Echocardiography revealed RCA territory akinesia, mild left ventricular systolic dysfunction with an ejection fraction of 40-45% and mild MR.

Patient was labeled as high risk procedure (calculated RCRI of ≥ 2) with an elevated risk of adverse perioperative cardiac outcome (predicted MACE of 6.6%) (Figure 1).

ANAESTHETIC MANAGEMENT

Patient was classified as ASA III and high risk consent was taken. Patient preferred regional anaesthesia after the risk benefit ratio of General and regional anaesthesia was explained to him. Clopidogrel was stopped 5 days before surgery and Glimepiride 24 hours before surgery. Two thirds of usual Insulin (NPH) dose was given the night before surgery and morning dose withheld on the day of surgery. ACEi (Enalapril) and Beta-blockers (Metoprolol) were continued in the perioperative period.

On the day of surgery, fasting status was confirmed and necessary investigations blood sugar (F) of 99 mg/dl, Platelet count of 1.78lacs/mm³, Na⁺ (134 mg/dl), K⁺ (3.4mg/dl) and

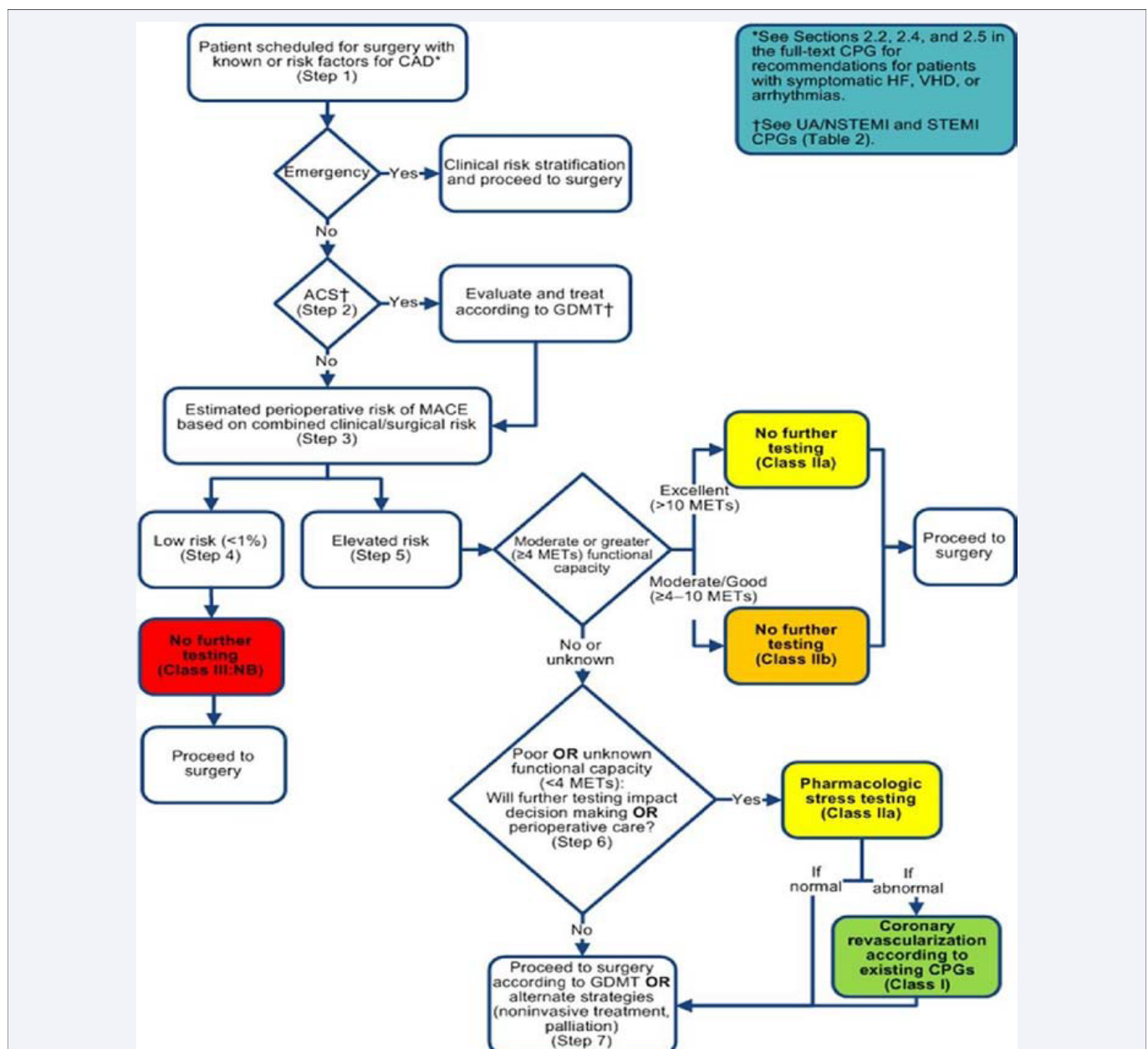


Figure 1 ACC/AHA Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Noncardiac Surgery: Executive Summary.

coagulation (PT/INR of 12.2/1.06) were checked. Standard monitoring included 5 lead ECG (including II, V5 ischemia sensitive), Pulse oximetry and non-invasive Blood Pressure (NIBP). Pre-operative baseline vitals (HR-85 bpm, BP-134/82 mmHg and SpO₂-97% on room air) were recorded and an I/V line was established. Inj. Pantoprazole 40 mg was given I/V and patient was preloaded with 500ml of 0.9% NS (8ml/kg).

Spinal anaesthesia was performed under all aseptic precautions, in sitting position; Skin was infiltrated with 2% plain xylocaine and a 25G Quincke spinal needle was introduced at L3-L4 intervertebral disc space. Inj. Bupivacaine 10 mg with fentanyl 25 ug was injected into the subarachnoid space after proper barbotage. Patient was laid supine and spread of the block was monitored by pinprick testing. A slight head-up position, guided by the curvature of the patient's spine, helped to achieve the desired sensory and motor block level (below T6). Inj. Midazolam (1mg) was given intravenously and Oxygen administered intraoperatively via Venti Mask. Vitals were recorded every three minutes for first 15 minutes and every 5 minutes thereafter. Systolic blood pressure remained between 110 and 130 mmHg, diastolic blood pressure between 70 and 80 mmHg and Heart rate between 60 and 90 bpm throughout the procedure. Inj. Ondansetron (4mg) was given at the end of surgery. Duration of surgery was 80 minutes and total intravenous fluid given intraoperatively was one litre. No episode of hypotension or bradycardia occurred during the procedure.

Postoperatively, SpO₂, non-invasive blood pressure and ECG monitoring with oxygen supplementation by ventimask were performed in the recovery room. Inj paracetamol was given as rescue analgesic in the postoperative period. A cardiology review was sought for reinstitution of antiplatelet therapy. Beta-blockers and antihypertensives were continued in the postoperative period and Patient was discharged home on first postoperative day.

DISCUSSION

The choice of anaesthesia for cardiac patients scheduled for non-cardiac surgery remains controversial. The frequency of perioperative complications is increased in surgical patients with cardiac disease. For example, approximately 6% of patients with a previous history of a myocardial infarction or significant coronary artery disease developed signs of myocardial injury during or following surgery and anaesthesia [9,10]. The frequency of myocardial reinfarction during the perioperative period is related to the time interval between the previous infarct and exposure to surgery and anaesthesia. The rate of reinfarction is reported to decrease from 27-37% in patients in whom myocardial infarction occurred within three months of surgery to 6% in patients who had an infarct six months or longer prior to surgery [9,11].

Advantage of Regional anaesthesia over General anaesthesia should be an asset in cardiac patients if the surgery can be performed under regional block. The patient can be premeditated with anxiolytics. Disadvantages of regional anaesthesia include hypotension from uncontrolled sympathetic blockade. Care should be taken while giving local anaesthetics because larger doses can cause myocardial toxicity and myo myocardial

depression. Tachycardia is the single most common abnormality that is often associated with ischemia, which by causing both an increase in demand and a reduction in supply can jeopardize the myocardium and bring about ischemic changes in susceptible patients [1].

Spinal anaesthesia is often recommended as a safe and preferred choice over general anaesthesia. The hemodynamic benefits of spinal anaesthesia over general anaesthesia include a minimum decrease in myocardial contractility and only modest decreases in blood pressure and cardiac output [12]. There are really three quite different types of spinal anaesthesia: high, low, and saddle. The modest physiologic trespass associated with low spinal anaesthesia makes this anaesthetic technique particularly useful in geriatric patients with pre-existing cardiac, respiratory, or cerebral complications undergoing orthopaedic procedures involving the hip and lower extremity, inguinal herniorrhaphies, or perineal procedures. Most rational means for handling hypotension during spinal anaesthesia is to increase preload [13]. Furthermore, adding intrathecal opioids allows reduced doses of local anaesthetics and better hemodynamic stability than conventional doses in spinal anaesthesia [14].

A 2014 review of nine systematic reviews of randomized controlled clinical trials summarises the outcome of neuraxial analgesia with or without general anaesthesia versus general anaesthesia alone in patients undergoing any type of surgery. In comparison with General anaesthesia use of neuraxial blockade alone reduces 0-30 day mortality and decreases the risk of pneumonia [15].

CONCLUSION

Our case report supports Regional anaesthesia as an alternative over General for anaesthetic management in patients with ischemic heart disease undergoing Below umbilicus non-cardiac surgical procedures as it reduces preload and after load, stress response, coagulation responses, coronary vasodilation, improved postoperative analgesia, reduces incidence of perioperative MI, maintains myocardial oxygen supply and reduces oxygen demand and harmful effects of GA such as hypotension due to intravenous induction drugs, tachycardia and hypertension due to pressor response during direct laryngoscopy and tracheal intubation.

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