SUMMARY

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Anaesthesia for vascular surgical procedures is a high risk specialty. This is attributable to two main factors. First, all the patients are classified in American Society of Anesthesiologist (ASA) as group III and IV which are the highest risk groups. Second, repair of the arterial lesion requiring surgical treatment may cause ischemic reperfusion injury. This can result in varying degrees of local cellular hypoxia and tissue necrosis plus systemic organ failure involving the lungs, liver and kidneys.

The patients should be assessed properly by taking good history and doing through examination and investigations. Almost every patients scheduled for vascular surgery is receiving regular oral medication from one or more of the drug groups used for treatment of cardiovascular diseases. The significance of these drugs is that they may interact with intravenous and volatile anesthetics causing undue hypotension.

Resection and grafting of the abdominal aorta is performed for the treatment of aneurysm and stenosing occlusive disease. The goals of surgery and avoidance of rupture and relief of symptoms with restoration and maintenance of blood flow to the viscera and legs. The anesthetic technique is similar for all types of abdominal aortic disease. A controlled airway with tracheal intubation and ventilation is essential because of the huge abdominal incision. This may be supplemented with epidural analgesia which is especially advantageous postoperatively. A regional anaesthetic technique alone is inappropriate for such major body cavity surgery.

Fluid and blood losses are large compared to other abdominal operations and adequacy of circulating volume is judged from measurements of the central venous pressure and pulmonary artery pressure. Because the operation involves a large abdominal incision with evisceration of the intestines, the core temperature may decline by up to 3-4°C and so core temperature should be monitored by an oesophageal probe.

Major disturbances of the circulation may arise at three points in the operation: in association with placement of intra-abdominal retraction and clamping and unclamping of the aorta. Removal of the intestines from the abdominal cavity followed by placement of large retractors to enable the aorta to be exposed may result in mechanical obstruction of venous return via the inferior vena cava, resulting in hypotension. Another cause of hypotension is associated with sudden tachycardia and facial flushing is the "mesenteric traction syndrome".

The consequences of cross clamping are similar regardless of the level at which the aorta is occluded, but the mangitude of the change is greater the higher the level. Infrarenal cross clamping is the normal (90% of patients), with mechanical effects on the circulation and ischemic consequences for the pelvis and lower limbs. The circulating effects are increased PAOP, SVR, mean arterial pressure and decreased cardiac output and preload.

Aortic unclamping results in restoration of blood flow to the ischemic tissues and vasodilated blood vessels of the lower half. The cardiovascular changes are broadly the opposite of those occurring during cross clamping. Thus the blood pressure and systemic vascular resistance

decrease (unclamping shock). The cardiac output, however, may decrease further owing to decreased preload from pooling of blood in the hyperemic lower extremities before returning to previous levels. There may also be acute blood loss from the graft anastomosis site.

Unclamping shock can be reduced in several ways. Fist the surgeon can release the clamp slowly. Second, when bifuraction graft is used, blood flow can be restored to one leg at a time. Third, anesthetist can prepare for unclamping by stopping vasodilators and reducing the concentration of volatile anaesthetic agent 5-10 minutes before the anticipated release of clamp, and rapid infusion of colloids and crystalloids. Renal and spinal cord protection are important goals in aortic surgeries.

Surgery on the ascending aorta routinely employs median sternotomy and cardiopulmonary bypass. Surgery on the aortic arch is usually performed through a median sternotomy with deep hypothermic circulatory arrest with focusing on achieving optimal cerebral protection. All patients undergoing aortic surgery should be left intubated and ventilated for 2-24 hours postoperatively.

Carotid disease is usually the result of atherosclerosis at the bifurcation of the common carotid artery. It is also frequently accompanied by coronary artery atherosclerosis, especially in hypertensive, diabetics and elderly patients. This plaque at the carotid bifurcation may produce symptoms either by reducing blood flow to the brain, resulting in hemodynamic insufficiency, or by atheroembolic or thromboembolic phenomenon.

Indications for carotid endarterectomy includes recurrent embolic transient ischemic attacks or reversible ischemic neurologic deficits not controllable with anticoagulant therapy, or transient ischemic attacks or reversible ischemic neurologic deficits accompanied by critical luminal narrowing of the carotid artery. Either of these presentations may be accompanied by a history of stroke.

Careful neurological monitoring is mandatory. During general anesthesia, methods used to determine adequacy of cerebral perfusion have included, carotid stump pressure (CSP), regional cerebral blood flow measurements, somatosensory evoked potentials (SEP), electroencephalogram (EEG) and most recently, transcranial Doppler (TCD).

As long as cardiovascular stability is maintained and the patient is awake at the end of the operation, any of the commonly used induction and maintenance anesthetic agent in combination with a short or intermediate acting non-depolarizing muscle relaxant can be safely used. Cervical plexus block (CPB) is another popular anesthetic technique. If properly done, it offers many advantages. However three prerequisites are essential. A short surgical time (preferably less than 120 minutes), Familiarity with the anesthetic technique, as well as patient understanding and cooperation are all three required. It is preferred to perform a superficial and deep cervical plexus block to improve the success of the block.