Anaesthesia for major vascular surgery

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Anaesthesia for vascular surgical procedures is a high riskspecialty. This is attributable to two main factors. First, all the patientsare classified in American Society of Anesthesiologist (ASA) as group illand IV which are the highest risk groups. Second, repair of the arteriallesion requiring surgical treatment may cause ischemic reperfusionmjury. This can result in varying degrees oflocal cellular hypoxia andtissue necrosis plus systemic organ failure involving the lungs, liver andkidneys.The patients should be assessed properly by taking good historyand doing through examination and investigations. Almost every patientsscheduled for vascular surgery is receiving regular oral medication fromone or more of the drug groups used for treatment of cardiovasculardiseases. The significance of these drugs is that they may interact withintravenous and volatile anesthetics causing undue hypotension.Resection and grafting of the abdominal aorta is performed for thetreatment of aneurysm and stenosing occlusive disease. The goals ofsurgery and avoidance of rupture and relief of symptoms with restorationand maintenance of blood flow to the viscera and legs. The anesthetictechnique is similar for all types of abdominal aortic disease. A controlledairway with tracheal intubation and ventilation is essential because of thehuge abdominal incision. This may be supplemented with epiduralanalgesia which is especially advantageous postoperatively. A regionalanaesthetic technique alone is inappropriate for such major body cavityFluid and blood losses are large compared to other abdominaloperations and adequacy of circulating volume is judged frommeasurements of the central venous pressure and pulmonary arterypressure. Because the operation involves a large abdominal incision withevisceration of the intestines, the core temperature may decline by up to3-4°C and so core temperature should be monitored by an oesophagealprobe.Major disturbances of the circulation may arise at three points inthe operation: in association with placement of intra-abdominal retractionand clamping and unclamping of the aorta. Removal of the intestinesfrom the abdominal cavity followed by placement of large retractors toenable the aorta to be exposed may result in mechanical obstruction ofvenous return VIa the inferior vena cava, resulting in hypotension.Another cause of hypotension is associated with sudden. tachycardia andfacial 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 isgreater the higher the level. Infrarenal cross clamping is the normalof patients), with mechanical effects on the circulation and ischemicconsequences for the pelvis and lower limbs. The circulating effects areincreased PAOP, SVR, mean

arterial pressure and decreased cardiacoutput and preload.Aortic unclamping results in restoration of blood flow to theischemic tissues and vasodilated blood vessels of the lower half. Thecardiovascular changes are broadly the opposite of those occurring duringcross :clamping. Thus the blood pressure and systemic vascular resistancedecrease (unclamping shock). The cardiac output, however, may decreasefurther owing to decreased preload from pooling of blood in thehyperemic lower extremities before returning to previous levels. Theremay 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 canprepare for unclamping by stopping vasodilators and reducing theconcentration of volatile anaesthetic agent 5-10 minutes before theanticipated release of clamp, and rapid infusion of colloids andcrystalloids. Renal and spinal cord protection are important goals in aorticsurgenes.Surgery on the ascending aorta routinely employs mediansternotomy and cardiopulmonary bypass. Surgery on the aortic arch isusually performed through a median sternotomy with deep hypothermiccirculatory arrest with focusing on achieving optimal cerebral protection.All patients undergoing aortic surgery should be left intubated andventilated for 2-24 hours postoperatively.Carotid disease is usually the result of atherosclerosis at thebifurcation of the common carotid artery. It is also frequentlyaccompanied by coronary artery atherosclerosis, especially inhypertensive, diabetics and elderly patients. This plaque at the carotidbifurcation may produce symptoms either by reducing blood flow to thebrain, resulting in hemodynamic insufficiency, or by atheroembolic orthromboembolic phenomenon.Indications for carotid endarterectomy includes recurrent embolictransient ischemic attacks or reversible ischemic neurologic deficits notcontrollable with anticoagulant therapy, or transient ischemic attacks orreversible ischemic neurologic deficits accompanied by critical luminalnarrowing of the carotid artery. Either of these presentations may beaccompanied by a history of stroke.Careful neurological monitoring is mandatory. During generalanesthesia, methods used to determine adequacy of cerebral perfusionhave included, carotid stump pressure (CSP), regional cerebral bloodflow measurements, somatosensory evoked potentials (SEP),electroencephalogram (EEG) and most recently, transcranial Doppler(TCD).As long as cardiovascular stability is maintained and the patient isawake at the end of the operation, any of the commonly used inductionand maintenance anesthetic agent in combination with a short orintermediate acting non-depolarizing muscle relaxant can be safely used.Cervical plexus block (CPB) is another popular anesthetic technique. Ifproperly 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 understandingand cooperation are all three required. It is preferred to perform asuperficial and deep cervical plexus block to improve the success of theblock.