Spinal cord ischaemia after aortic aneurysm repair

- During both open and endovascular repair of aortic aneurysms some branches of the aorta will be blocked off (e.g. lumbar arteries, intercostal arteries). This may result in spinal cord ischaemia and paraplegia.
- Perfusion of the spinal cord may still be maintained via collaterals. Flow through these collaterals will depend on mean arterial blood pressure (loss of autoregulation, linear correlation of pressure and flow).
- Neurological symptoms can occur early after surgery but can also occur several days later (delayed-onset spinal cord ischaemia).
- Neurological symptoms are often precipitated by episodes of arterial hypotension.
- It is well documented that CSF pressure rises dramatically when spinal perfusion is interrupted. The mechanism of this rise is not well understood. The increased CSF pressure will further compromise spinal cord perfusion (spinal perfusion pressure = mean regional arterial pressure minus CSF pressure).
- Therefore, the prevention/treatment of spinal cord ischaemia consists of
  - blood pressure augmentation (fluid resuscitation plus vasopressors)
  - CSF drainage via a lumbar catheter.

Any neurological deficit after aortic surgery suggestive of spinal cord ischaemia represents an emergency requiring immediate intervention. The more time without intervention the less chance of recovery of neurological function.

- The on-call anaesthetist and the registrar on call for Vascular Surgery should be called to increase the patient’s blood pressure and to start CSF drainage. Treatment may need to be commenced on the ward but the patient will subsequently need to be moved to a critical care area.
- Blood pressure augmentation should not be delayed by the insertion of a central and/or arterial line. A “peripheral” vasopressor can be infused initially through a peripheral venous cannula (e.g. Phenylephrine 10mg in 100ml Normal Saline, via infusion pump, 10 – 30mls per hour). The mean arterial blood pressure should be kept above 90mmHg. Make sure the vasopressor is not masking hypovolaemia. Consider a fluid challenge.
- Lumbar catheters and drainage systems can be found in Theatre 8
- Other causes of neurological deficits may need to be considered. This should not delay blood pressure augmentation and CSF drainage.

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References