Closing the loop: Re-audit of the insertion and management of lumbar cerebrospinal fluid (CSF) drains in thoracic endovascular aortic repairs (TEVARs)

Dr Joel Thomas1 BSc MBBS, Dr Nathan Peters1 BPharm MBBS FANZCA, Dr Rudolf Van der Westhuizen1 MBChB FANZCA

1Royal Brisbane and Women’s Hospital

Introduction:
TEVARs are high risk vascular surgical procedures associated with a 2-10% risk of developing spinal cord ischaemia (SCI).1 Lumbar cerebrospinal fluid (CSF) drains are recommended in patients undergoing this procedure to reduce the risk of SCI.2

Patients deemed high risk of post-operative SCI are those with compromised hypogastric/iliolumbar circulation supplying the anterior spinal artery, extensive aneurysmal disease with coverage of thoracic segment more than 20cm, symptomatic SCI, and compromised collateral pathways such as in previous abdominal aortic aneurysm (AAA) repair.3

Aim:
The insertion and management of lumbar CSF drains are infrequent practices amongst clinicians, and thus, it is important to audit the processes surrounding lumbar CSF drains against best practice guidelines. Adherence to the international guidelines below may reduce the risk of SCI.2,4

Results:

Drain Insertion and Management:
- 28 TEVARs were performed
- 14 lumbar CSF drains placed: 13 by Anaesthetics, 1 by Neurosurgery
- 1 Patient required 2 lumbar CSF drains
- Consent for drain placement was documented in 78%
- Coagulation profiles were completed and normal for all insertions, but profiles were not repeated prior to drain removal in 50% of cases
- Drain removal was documented in 78%, with the other 2 drains removed at 76 hours.

Complications:
- There were no serious complications related to the lumbar drains
- Drain occlusion occurred in 2 patients (14%) with one of these cases not developing any adverse sequelae
- Moderate to severe headache occurred in 2 patients (14%) and were successfully managed conservatively

Spinal Cord Ischaemia:
- The incidence of new spinal cord ischaemia after TEVAR was 7.1% (2/28)
- SCI occurred in 1 patient without a lumbar CSF drain
- SCI occurred in 1 patient with a lumbar CSF drain that obstructed

Conclusions and Recommendations:
Best practice guidelines were well adhered to at this institution. The incidence of SCI was within the range described in the literature of 2-10%.5 Complications were low, but in the context of a small sample size. Areas of improvement identified were the documentation of consent, and the need for repeat coagulation studies prior to drain removal. An institutional protocol may help better adhere to best practice guidelines, and recommendations moving forward include:
- Advocating for the use of large diameter lumbar drain specific catheters with multiple drainage holes to minimise risk of drain obstruction
- Confirmation of a full coagulation profile within 24 hours of lumbar drain removal
- Code of protocolised post-operative instructions in patient chart, including when to clamp and unclamp drain for toileting and physiotherapy.

References:
doi:10.1007/CoAJE.0000000000000188
doi:10.1007/CoAJE.0000000000000188

Methods:
Data was retrospectively collected on patients who received TEVARs at a single tertiary referral centre between January 2015 and December 2019. Access was approved to the Operating Room Management Information System (ORMIS) and integrated electronic medical record system (iEMR).