TRANSOESOPHAGEAL SPINAL CORD STIMULATION FOR MOTOR-EVOKED
POTENTIAL MONITORING: FEASIBILITY, SAFETY AND STABILITY

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Objectives: Specificity of transcranial motor-evoked potentials (MEPs) is low because amplitude fluctuation is common. This may be partly due to synaptic transmission within the brain. This study aimed to investigate the feasibility, safety and stability of transoesophageal spinal cord stimulation for MEP monitoring.

Methods: Eight anaesthetised adult beagle dogs were used. Transoesophageal stimulation was performed between the oesophageal luminal surface electrode (cathode) and a subcutaneous needle electrode (anode) at the third thoracic vertebra level. A train of 5 pulses with a 2.0-ms interval was used. Compound muscle potentials were recorded from 4 limbs. Stability to anaesthetic agents was tested at varying speeds of propofol and remifentanil, and effect of 5% sevofluorine inhalation was also evaluated.

Results: Transoesophageal MEPs could be recorded without difficulty in all dogs. Fluoroscopic evaluation showed that electrode misalignment up to 10 cm could be tolerated. Stimulus intensity to achieve maximum amplitude was 320 ± 40 V by transoesophageal stimulation and 475 ± 43 V by transcranial stimulation. No arrhythmia was provoked. Five animals that were allowed to recover showed no neurological abnormality. In the 2 sacrificed animals the explanted oesophagus showed no mucosal injury. Both transcranial and transoesophageal stimulation showed stability to varying speeds of propofol and remifentanil. Transoesophageal but not transcranial stimulation showed stability to sevofluorane in 2 of 4 animals, but this finding was not shared in the remaining 2 dogs.

Conclusion: Transoesophageal stimulation was easy and safe. Although stability to anaesthetic agents was not confirmed, its technical ease warrants further studies on the response to spinal cord ischaemia.