Ultrasound-guided epidural catheter placement with a new technique: preliminary cadaveric study.

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Abstract

Several methods are described in veterinary medicine to perform and assess correct epidural needle placement to provide effective epidural analgesia (Adami et al. 2017). The aim of this study is to evaluate the feasibility of an ultrasound longitudinal sagittal approach to epidural catheter placement using a biopsy needle guide. Seven dog cadavers were used in the study. With the cadaver in sternal recumbency, a 5-8 MHz microconvex transducer provided with a 16-gauge biopsy guide was positioned to obtain a longitudinal sagittal scan of the spinal process of L7 and the sacral crest; the epidural space was identified between two parallel hyperechoic lines and, as the trajectory of the biopsy guide crossed them, a 17G Tuohy needle was used to insert a 19G epidural catheter. Correct catheter placement was visualised through a resection of the column between L2 and L3. Firstly, an expert echographist (operator C1) visualised the ultrasonographic landmarks, while catheter placement was performed by an expert anaesthetist (operator A), a student (operator B) and another expert echographist (operator C2) (double-operator technique); secondly, operator A and C2 performed alone the whole procedure (single-operator technique); lastly all operators performed a blind procedure (Jones, 2001). Operator A failed 2/7 single-operator procedures; time to perform the blind technique was statistically lower than the double-operator technique (75 ± 132.4 vs 91.6 ± 79.3 seconds). Operator C2 failed 3/7 blind procedures, scoring the higher total time of performance (329.3 ± 271.2 seconds), but was able to perform both the double- and single-operator technique without significant difference with operator A, despite a faster time in positioning the probe. Operator B showed a higher repositioning attempts of the needle with the double-operator procedure compared to the blind one. Ultrasound guidance appears to be a promising technique to ease catheter placement also by operators inexperienced of locoregional techniques.

References

Adami, C., Gendron, K., 2017. What is the evidence? The issue of verifying correct needle position during epidural anaesthesia in dogs. Veterinary Anaesthesia and Analgesia. http://dx.doi.org/10.1016/j.vaa.2016.03.003