

KeywordsUltrasound, Epidural catheter, Dog,
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DIPARTIMENTO DI SCIENZE VETERINARIE
PER LA SALUTE, LA PRODUZIONE ANIMALE
E LA SICUREZZA ALIMENTARE

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 echographer (operator C1) visualised the ultrasonographic landmarks, while catheter placement was performed by an expert anaesthetist (operator A), a student (operator B) and another expert echographer (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

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