

Feasibility of electrical impedance monitoring of dogs in an intensive care unit

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Electrical impedance tomography (EIT) has experienced an upswing in research in recent years,¹ but long-term monitoring in a clinical setting in awake dogs has not been described.

Seven dogs admitted for non-pulmonary diseases were monitored with a custom-made EIT belt (figure 1), which was secured with an elastic bandage after applying ultrasound gel on the washers. The goal was to determine the feasibility of wearing the belt and performing EIT recordings every 4 hours for up to 48 hours. Descriptive statistical analysis was performed using Microsoft® Excel® Version 2402.

A total of 42 measurements were taken in seven dogs, with 2 - 11 measurements (6 ± 3.8) per dog. One dog wore the belt only intermittently due his activity level, while the remaining dogs wore it between 4 and 40 hours, averaging 22 ± 15.5 hours.

Interference with monitoring equipment (ECG, pulse oximetry) was not observed. None of the dogs exhibited intolerance of the belt (e.g., unwillingness to lie down, scratching, biting, or removal attempts). A thrombocytopenic dog wore the belt for 40 hours without developing ecchymoses. One dog developed washer-related skin indentations where the skin had been clipped for surgery after wearing the belt for 8 hours. No bleeding was noted, and the dog was not uncomfortable.

The average number of failing electrodes per recording was 2.4 ± 2.6 with a maximum of seven failures, yet images and data were still generated. Between two measurement points, the belt had to be repositioned 14.7% and gel had to be reapplied 36% of the time.

EIT belts are well tolerated by awake dogs for extended periods of time. A better solution for maintaining electrode contact is desirable.

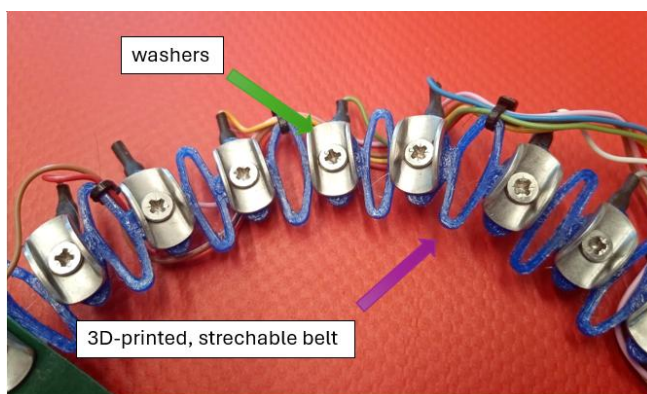


Figure 1. EIT belt with washers.

References

Brabant OA, Byrne DP, Sacks M, et al. (2022) Thoracic Electrical Impedance Tomography - The 2022 Veterinary Consensus Statement. *Front Vet Sci* 9:946911.