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Sheep head frame validation for CT and MRI studies

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Abstract

Aim of EDEN 2020 (see references) project's Milestone 5 is the development of a steerable catheter for CED system in glioblastoma therapy. The VET group is involved in realization and validation of the proper animal model.

In this part of the study two fresh sheep's head from the local slaughter were used.

The heads were located into an *ad hoc* Frame system based on anatomical measures and CT images, produced by Renishaw plc partner in this project. The frame was adapted and every components were checked for the *ex vivo* validation tests.

CT imaging was taken in Lodi at Università degli studi di Milano, Facoltà di Medicina Veterinaria, with CT scanner and MRI imaging was taken in La Cittadina, Cremona.

System validation was approved by the *ex vivo* trial.

The frame system doesn't compromise the imaging acquisition in MRI and CT systems.

Every system components are functional to their aims.

The Frame system is adapted to the sheep head. It is composed by elements able to lock the head during the imaging acquisition. Frame system is characterized by a support base helping the animals to keep the head straight forward during imaging time, under general anesthesia. The design of these device supports the airways anatomy, avoiding damaging or obstruction to airflow during anesthesia period.

The role of elements like mouth bar and ovine head pins is to lock the head in a stable position during imaging acquisition; fixing is guaranteed by V shape head pins that are arranged against the zygomatic arches. Lateral compression forces to the cranium, and the V shape pins avoid the vertical shifting of the head and any kind of rotations. (Fig. 1)

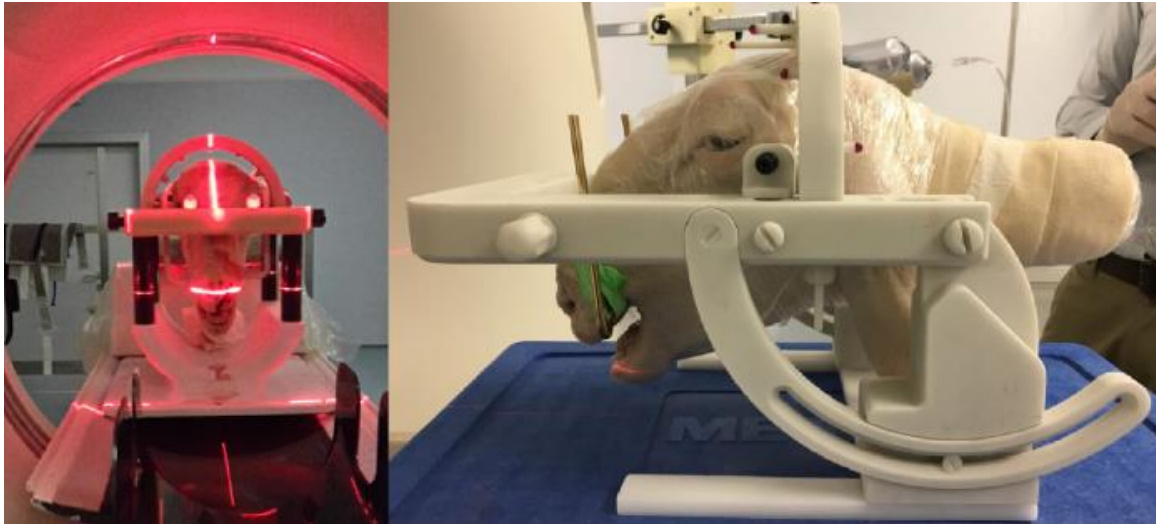


Fig.1: Sheep head during CT imaging acquisition. The role of the frame is to preserve a physiological position of the head, along its median axis, without inclinations and rotations.

References

<http://www.eden2020.eu/>

http://cordis.europa.eu/project/rcn/200392_en.html