

Learning surgery in humans still depends on the use of some big animals¹

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For decades, the development and training of some surgical procedures in humans have relied on the use of large animals, whose thoraco-abdominal anatomy and physiology are close to those of humans. The development of organ transplants was the most demonstrative example since it requires learning surgical techniques within the thoracic and abdominal cavities, using laparoscopy, endoscopy or a robot.

In France, as in many other countries, part of the training for endocavitary surgery is carried out in animals, primarily pigs, whose similarities in size and organ anatomy with those of humans enable this training. This step, essential in the training of a surgeon, is carried out in the condition of surgery in humans (anaesthesia, asepsis) in dedicated, duly authorized facilities monitored by the relevant State services, some of which being recognized internationally as exemplary.

Recent events have revealed that the use of animals to teach some surgical procedures intended for humans was contested, mainly due to the conditions of breeding and transport of animals (1).

Despite the advancement of more or less sophisticated mannequins and in silico learning models, the use of an animal model to learn endocavitary surgery remains an essential part of surgeon curriculum training (2, 3). To date, in vitro and in silico models have not been able to provide surgeons with a realistic haptic feedback (i.e. a sense of touch) and are unable to reproduce correctly the bleeding linked to vascular effractions which may occur and modify the perception of the operating field. While we can be confident that rapid progress, particularly in the development of sufficiently realistic in silico models linked to the increase in real-time computing power (4), will lead to no longer resorting to learning on animals, abandoning the use of animals today would lead to imperfect training of surgeons and, correlatively, a higher surgical risk for patients.

In view of the controversy surrounding the use of animals for the learning of surgical techniques, particularly in the thoracic and abdominal cavities, the French Academy of Medicine:

- Points out that the quality of surgeon training determines the quality and safety of surgical therapies;
- Underlines that, although in vitro and in silico learning models should be used as a first line of defence in order to limit the number of animals used in training, they are not currently sophisticated enough to exclude the use of animals;
- Also underlines that the use of animals, limited to what is strictly necessary, must be carried out with full respect for animal welfare, particularly regarding the conditions of breeding, transport and housing of animals, according to an ethical assessment by an official body and under the supervision of a veterinarian;
- Recommends to strengthen the funding of research aimed at improving learning methods for the various in vitro and in silico surgical techniques.

References

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