

The Future of Black - Boxes in Surgery

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The increase, in the last years, of the processes of malpraxis in the surgical field has led to the possible idea of installing systems of supervision, monitoring and recording of the surgical interventions. Thus came the idea of installing in the operating rooms of some black boxes, similar, in a way, to the aviation ones. Obtaining some elements of aviation is not a new idea in surgery. It was used in the creation of checklists by Atul Gawande several years ago. The implementation of the checklists has led to a visible improvement of the results in the surgical sections, drastically reducing the number of infectious complications and not only [1].

After an airplane crash, the black box offers important information regarding what was happening in the aircraft before the incident. A form of that technology is now being tested at a Canadian hospital as a means of documenting what happens in an operating room during the surgical procedure [2].

From a technological point of view, there are several video cameras, which record from various angles, microphones and sensors that record parameters in the operating room, such as ambient temperature. Then, all the data is processed and analyzed by software and by the need of specialists. Thus, it will be possible to reconstruct in retrospect what happened in the theatre at a certain time.

The complex issues that arise are ethical. The discussions are about the legislation, the informed consent and the acceptance, both from the patient and from the surgeons. Then, there is the problem of access to that information. A sustained and logical point of view from the medical community is that only the specialists have the same ones in black-boxes, in order to increase the quality of the medical act. It would be dangerous to distort the interpretation of the data by non-specialists, and the questionnaires offered to physicians in this regard confirm that they would not agree that the raw images come to justice [3].

Laparoscopic cholecystectomy, which is a prototype of laparoscopic interventions, has progressed by recording the images

and reviewing them by the training surgeons, with comments on the images. Thus, for example, the causes of conversion could be analyzed and how the conversion could be avoided, leading to a decrease in the percentage of these cases within acceptable limits. Also through the analysis of intraoperative filming the concept of critical view of safety appeared as a standard of care [4], and the complication rate decreased. Similar improvements in procedures and lower morbidity and mortality are expected from the black boxes, with direct benefit to patients [5].

All these issues keep the controversial topic for now. But most likely, we estimate that in a few years it will become widely used and then mandatory. It will lead to progress in surgery, similar to aviation progress. Trained physicians will be able to learn from images and examples that are the best tactics in surgery. In the case of litigation, the most relevant opinions are that the information be analyzed by a commission of experts who will give a verdict.

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