



Ethics of Live Surgery Demonstration or Broadcast: Is It Beneficial to the Patients?

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“If you want the ultimate thrill, you’ve got to be willing to pay the ultimate price.”

- Mark Foo-

Many people, including myself, love to watch live sports broadcasts to witness, in real-time, exciting performances like Heung-Min Son’s wonder goals in English Premier League, or Tiger Woods’ beautiful shots in Masters. For those who love watching live events, the thrill of uncertainty makes it a far more pleasurable experience than recorded events. Similarly, in surgical fields, especially in endovascular interventions, live surgery demonstration (LSD) is a very popular practice. LSD is a rapidly growing trend, not only in many international surgical society meetings, but also in social media and television shows. However, many concerns still exist regarding live surgery in terms of patient safety and ethics, with a particularly relevant issue being how to best guarantee patient safety whilst still obtaining educational merits of LSD.

A Google search of the term “live surgery death” yielded 4 cases reported in newspapers. However, the very same search on PubMed yielded nothing, indicating a serious reporting bias in the scientific world. Two cases of LSD-related mortality have occurred during international heart conferences, with one of these cases happening after percutaneous cardiac valve implantation performed by an Italian doctor in Milan, live telecast to a conference in Washington, 2004 [1]. A third case of LSD-related mortality occurred in Japan, September 2006, during aortic aneurysm intervention performed by a Japanese surgeon from a different hospital [2], and a fourth in India, August 2015, during a laparoscopic liver tumor surgery performed by a

Japanese surgeon [3]. This may only be the tip of the proverbial iceberg, however, and major complications following LSD have not always been transparently reported. Many surgical societies in Japan, England, and USA have banned the practice of the live surgical broadcast [4-6]. The European Association of Urology recognizes the educational role of live surgery and endorses live case demonstration at urology meetings that are conducted within a clearly defined regulatory framework [7]. The overriding principle is that patient safety must take priority over all other considerations when conducting LSD.

Live surgery broadcast (LSB) to the public is a more controversial practice than LSD. Although medical advertisements and showing surgical procedures in pictures or videos for commercial purpose are illegal in Korea, it is nonetheless happening widely in many social media platforms and in commercial TV abroad. McLachlan [8] reported three LSBs on a London TV channel over three evenings in November 2018. The surgeons who participated in this TV program told that the program could help demystify surgery and thereby reduce patients’ anxiety around undergoing surgery. The program had a reported one million viewers each night and received largely positive audience responses on Twitter. The merits of LSB include demystifying surgery, reassuring future patients by reducing fear of the unknown, and also inspiring future clinicians.

However, McPherson and Asif [9] pointed out that all the benefits of a LSB to the public can be realized without LSB, arguing that a recorded, step-by-step operation with accompanying commentary still allows the general public to witness the operation, but without jeopardizing patient safety. Other disadvantages of LSB include increased dis-

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traction of the operator due to the stressful nature of live broadcasts, potential increase in patients' risk of infection from filming personnel, and the physical stress of performing an operation outside of regular working hours. In conclusion, the Royal College of Surgeons stated that LSB-related risks to patient safety outweighed its potential benefits, and therefore recommended avoiding live broadcasting of patients undergoing surgery to a non-clinical audience [6].

However, the real debate around LSD to a professional audience remains. There are many attractive features and educational benefits of LSD, especially in the field of vascular surgery: Expert surgeons can train less or non-experienced surgeons in surgical or endovascular procedures, attendees can observe experts' skills and techniques in performing challenging or complex cases with new devices, they can listen to an experienced panel discussion covering various surgical options and ways of improving the decision making process, they can join in the active bi-directional discussion, and attendees can watch many life-saving ideas being implemented in cases of complication [10]. Given the vigorous competition between vascular surgical conferences, the inclusion of LSD has become closely related to their success. Many hosts of scientific meetings try to present more challenging, thrilling, and novel LSDs to attract more attendees, try to use novel devices or instruments to satisfy their sponsors and early adopters, and try to earn pioneering, cutting edge reputations for their conferences.

There are definitely increased risks to patients during LSD because of increased surgery performance time due to frequent interruptions, the need to schedule procedures to fit in with meeting times, longer patient waiting lists or overbooking for possible sudden cancellations before the operation, longer anesthesia time, and operators leaving procedures early for their next live demonstration. Infection control and possible breaches of patient confidentiality are difficulties also associated with LSD. Distraction of the operator is somewhat inevitable due to the nature of live surgery and interruption by the panelists, especially when the operator is not very familiar with the new device or instruments, the OR team, or the facility the surgery is being performed in. The resultant anxiety can worsen surgeons' performance and jeopardize patient safety. Sugarman et al. [10] reported an interesting internet-based survey of clinicians who attended the VIVA (Vascular Interventional Advances) live surgeries. Most attendees responded that observing LSDs was more valuable than watching prerecorded videos (70%-82%). Although observers did not think that LSD patients were exposed to higher risks (19%-24%), the operators agreed that patients were at significantly higher risk (56%-44%).

Many societies have recommended certain solutions to minimize the distraction of the surgeon and the risk to the patient, including the use of a second operator to minimize distraction and implementing strict guidelines for panels in terms of how and when commentary should be provided [4-6,10]. All potential risks should be disclosed to the patients during the informed consent process. Guidelines for the ethical performance of LSDs are essential, including commitment to patient safety and privacy, and full disclosure of any conflict of interest among the operators and expert panelists [10].

Even in animal research, the ethical principles of the "3Rs" (representing replacement, reduction, and refinement) are strictly adhered to, and the plan for any animal research should be first approved by the Institutional Animal Care and Use Committee (IACUC), an objective organization overseeing animal care and use. In clinical research, more stringent principles should be followed to ensure patient safety. We need to consider LSD not as clinical practice, but as a form of clinical research, which should be approved by the Institutional Review Board (IRB). Through applying the 3Rs, we need to find ways to replace LSD with recorded live demonstrations, or to reduce the case numbers, running time, and cumulative harm to patients, and to refine techniques so as to minimize the risks to both the patient and the operator. A suitable alternative to LSD is the "recorded live" option. Cases which have not been presented elsewhere are selected, and the whole procedure is recorded and shown unedited, or with minimal editing through deletion of obscured scenes. After a briefing of the patient's symptoms and presentation of images by the operator attending the meeting offline or online, surgical planning can then be thoroughly discussed. Following this, the selected procedures can be demonstrated by unedited video, while expert panels can discuss the case without time constraints. Many technical questions can also be answered, either while the video runs or by pausing it. Rewind and replay functions are available, and slow motion and pointing out of important structures are also possible. In this way, the educational purpose of live demonstrations can be fully satisfied without jeopardizing patient safety and with minimal costs and greater independence from sponsors. The recorded materials can later be released as video-on-demand to medical professionals or students who did not attend the meeting, or for repeated educational use. Joining a live BTS concert would be fantastic, but watching a recorded video of them performing "Black Swan" is also breathtaking.

It is time for the National Societies for Vascular Surgery to devise guidelines for dealing appropriately with these important LSD-related issues, and to collaborate with international societies to find a global consensus.

CONFLICTS OF INTEREST

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