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Patient Safety and Outcomes From Live Case Demonstrations of Interventional Cardiology Procedures

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Objectives The goal of this study was to examine the safety and results of interventional procedures performed during the broadcast of live case demonstrations.

Background Professional meetings using live case demonstrations to present cutting-edge technology are considered a valuable educational resource. There is an ongoing discussion on whether patients who are treated during live case demonstrations are exposed to a higher risk.

Methods Between 1998 and 2010, 101 patients were treated during live transmissions from a single center in 15 invasive-cardiology conferences. Technical success was defined as the ability to effectively perform the planned procedure without any major complication. The primary endpoint of the study was the composite occurrence of death, myocardial infarction, or stroke.

Results The interventional procedures included coronary (n = 66), carotid (n = 15), peripheral (n = 1), valvular (n = 2), congenital heart disease (n = 12), and complex electrophysiological mapping and ablation interventions (n = 7). In 4 cases, the intended procedure was not done. The procedure was technically successful in 95%. In 5 cases, the procedure was unsuccessful because of the inability to cross a chronic total occlusion. There were no deaths during the hospital stay, and the composite primary endpoint occurred in 2 patients: a minor stroke following an atrial fibrillation ablation and a rise in serum troponin levels after percutaneous coronary intervention. These results were no different from those of 66 matched controls who underwent procedures performed by the same operators but not as live case demonstrations (relative risk: 0.32; 95% confidence interval: 0.02 to 3.62, p = 0.62).

Conclusions In this consecutive series of interventional cardiology procedures that were performed by expert operators during live demonstration courses, the procedural and 30-day clinical outcomes were similar to those found in daily practice and to those that have been reported in the contemporary published data. These results suggest that broadcasting live case demonstrations in selected patients from selected centers may be safe. (J Am Coll Cardiol Intv 2012;5:215–24) © 2012 by the American College of Cardiology Foundation

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The number of transcatheter cardiovascular interventions has increased dramatically and the technique has improved significantly during the past decades. Newer and better devices, improved pharmacological treatments, and enhanced visualization, guidance, and monitoring now enable a safer and more efficacious procedure. As a result, the periprocedural event rate has fallen over the past years (1,2).

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The training in interventional cardiology involves direct mentoring by experienced cardiologists during an actual clinical procedure, as well as learning from peers during professional meetings and focused courses. Rapid advances in technology, the demand to improve quality and safety, and the dissemination of information on new tools, equipment, and state-of-the-art interventional techniques have led to the development of courses with live case demonstrations around the world for dissemination of information and training purposes.

Abbreviations and Acronyms

CI = confidence interval
CTO = chronic total occlusion
EP = electrophysiological
FDA = Food and Drug Administration
MCRS = Mayo Clinic Risk Score
MI = myocardial infarction
PCI = percutaneous coronary intervention
RR = relative risk
VF = ventricular fibrillation
VT = ventricular tachycardia

The growth in the number of meetings with live case demonstrations of interventional procedures is true not only in cardiology, but also in surgery, gastroenterology, and other medical disciplines. In cardiology, the procedure is performed in the catheterization laboratory and is transmitted to a conference hall, which can be in the same medical center, but often is at another location on the globe.

It is assumed that during live case demonstrations, the operators perform the procedure in a more stressful environment than in daily routine work. There are cameras and production personnel in the catheterization laboratory, and an expert panel in the conference hall interacts with the operator and team, discusses the case, and advises what they think should be done. Every step of the procedure is broadcast onto large screens. Frequently, novel devices are used, and the cases that are chosen for the demonstration are exceptionally challenging because the "regular" cases are not as educational or informative. The operator and the team are required to discuss their plans and rationale with the panel or the audience while still in the midst of the procedure. Thus, the operator and the team have to deal, not only with a complex procedure, but also with an expert panel that may often criticize the interventional plan, and may even suggest an alternative approach.

There has been an ongoing discussion about the ethics of live demonstration and the patient safety of these procedures from the early days of live demonstration broadcasts of interventional procedures (3–10). Despite the increasing use of this educational modality in medical meetings, there are only 2 published reports that have investigated the patients' safety during live case demonstration in transcatheter therapeutics: 1 report from 1992 on coronary procedures, and a second report from 2009 on carotid interventions (4,5). Therefore, we sought to examine the results of transcatheter cardiovascular procedures that were performed during live demonstration transmissions at our center since 1998.

Methods

This study was performed in compliance with the local human studies committee. The study is comprised of all patients in whom a procedure was attempted and transmitted live to interventional cardiology conferences, which our center organized or participated in between 1998 and 2010. The primary operators were experienced cardiologists from our center and, in only a few cases, international guest operators. Overall, 8 primary operators participated in coronary procedures, 2 operators in pediatric procedures, and 4 in electrophysiological (EP) procedures. In all cases, 1 or 2 additional secondary operators participated. The medical conferences were international and national. Written informed consent for treatment and live transmission of the procedure was received from all patients before the procedure. The procedure was performed in the standard way, and all medications were given in the customary manner.

The operators were connected to microphones, and the filming staff was present in the room. The operators discussed each step of the procedure and responded to the many comments of the expert panel. The discussion took place before the procedure was done, during the procedure, and after completion. In the annual local meetings, which have been organized by our center since 1998, there were parallel transmissions of live demonstrations from 3 catheterization laboratories. In these cases, the operators needed to pause according to the scheduled transmission slot. Hence, some of these procedures took longer than usual to complete. In all these cases, patient safety was always the top priority. When scheduling caused a significant delay, parts of the procedure were not transmitted live, and the procedure presentation, as well as the discussion, were done at the end of the procedure.

Data were collected from the medical records, procedure notes, catheterization films, conference programs, live case schedules, and follow-up visits.