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Debriefing Using Medical Data Recorders in the Operating Room: This is How We Do It

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Aims: Debriefing originated in the military and was designed to receive all the information from a soldier or pilot after a mission, to assess the individual for personal and team benefits and to return him or her to regular duties as soon as possible. It has been co-opted by other high-risk industries like aviation, the oil-, and the nuclear industry. Recently, debriefing is deployed as a method to help medical teams; mostly after simulation training. There, video-assisted debriefing has shown to be a powerful tool to improve both technical and non-technical skills such as communication, team effectiveness and situational awareness. A true team debriefing culture after performing surgery is lacking, as is a generic validated method to do so. Consensus on how to translate debriefing into clinical practice and structured guidelines based on longitudinal studies are missing. During the implementation of the OR Black Box® in our centre, we developed an international standardized debriefing model to be used as a guide for surgical team debriefings using medical data recording in the operating room (OR).

Method: A novel template for debriefing is developed based on the literature regarding debriefing in simulation, medical teams using data recording and other industries.

Results: In a Black Box augmented OR, care must be taken not to overload the independent facilitator of the debriefing session nor the OR team with a multitude of data. Therefore, a model for providing optimal feedback using medical data recordings should ensure a structured, safe and solution-oriented way of debriefing. It should not exceed 45 min in order to be accepted, to not disturb workflow, and to convey the important messages to the OR team.

Conclusion: Adults learn best when they are actively engaged in the process, which means learning by doing, thinking about it and the assimilation of lessons learned into everyday behaviours. Structured debriefing with the use of a medical data recorder may improve patient safety. The debriefing model is demonstrated and outlined.

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Openhelp Colorectal: Building of a Realistic Phantom for Laparoscopic Research and Training in Colorectal Surgery

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Aims: Laparoscopic surgery requires extensive training of surgical residents in order to ensure safety in a clinical setting. Thus, preclinical training curricula have been developed and it has been shown that skills obtained in a preclinical setting can be transferred to the operating room. Here, realistic training with animals comes with high costs and ethical problems. Phantom models on the other hand focus on single tasks in an artificial environment. To overcome these limitations we developed a phantom for simulating rectal resection based on the Open Heidelberg Laparoscopy Phantom (OpenHELP).

Methods: The procedure of laparoscopic rectal resection for rectal cancer was analyzed and a model of the different steps was created. For each step a certain task was defined that could be reproduced in a phantom model and then was realized using organs made from silicone and peritoneum made from latex sheets. The final phantom model was used by a single surgeon to test its applicability for laparoscopic training and as a model for research on surgical robotics. Here, the whole procedure was performed several times (n=20) and task time for the single steps as well as for the whole operation was recorded.

Results: The procedure of laparoscopic rectal resection was divided into 13 distinct steps. The duration of the whole procedure decreased from 71:06 min for the first operation to 19:40 min for the 20th operation. Here, opening of the lesser pelvic peritoneum was the longest step, decreasing from 11:45 min to 4:22 min, and visual inspection of the lesser pelvis was the shortest step, duration decreasing from 0:52 min to 0:28 min.

Conclusion: We developed a phantom model that mimics several steps of a complex laparoscopic procedure, the resection of the rectum for rectal cancer. This phantom model also includes different quadrants of the abdomen to operate in as well as handling of organs as different as colon, spleen and inferior mesenteric vessels. Feasibility of training in this phantom model was shown. Further studies have to include more participants in order to test validity of the model.

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Single Incision Laparoscopic Appendectomy is Feasible Even for a Resident

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Aims: Conventional laparoscopic appendectomy (CLA) has been considered the standard for the treatment of acute appendicitis. Recently, single incision laparoscopic appendectomy (SILA) has become an alternative option and the use of SILA is increasing. Although several studies had reported the safety and technical feasibility of SILA, there are few reports on the results of SILA performed by residents during the training period. The present study, we report our residents' experience.

Materials and Methods: We reviewed clinical characteristics and outcomes of 1005 patients who underwent appendectomy between October 2013 and April 2016. Every operation was performed by only residents. Clinical characteristics and operative outcomes between SILA and CLA group were reviewed after propensity score matching.

Results: SILA was used more frequently in younger patients (23.3 vs. 36.4 yrs, p=0.000), women (66.4% vs. 45.9%, p=0.000), and patients with lower BMI (20.2 vs. 22.9 kg/m², p=0.043). After propensity score matching, the rate of complicated appendicitis was lower (12.9% vs. 15.5%, p=0.573), and the mean operative time was slightly shorter in the SILA group than in the CLA group (56.68 vs. 59.09 min, p=0.068), although these differences were not statistically significant. There were no significant differences between the two groups in hospitalization period (2.7 vs. 2.9 days, p=0.380), the use of analgesics (2.0 vs. 2.1 times, p=0.128) and wound complication rate (10.3% vs. 14.6%, p=0.333). Mean operative time decreased yearly in all groups except the SILA group (p=0.000). In particular, mean operative time decreased significantly between the 2nd and 3rd years in the CLA group for simple appendicitis (83.77 vs. 69.36 min, p=0.016) and in the entire group (68.46 vs. 59.45, p=0.001).

Conclusion: SILA is a feasible alternative even for resident level surgeons if they overcome the learning curve. It is a safe and relatively easy procedure with an acceptable postoperative cosmetic outcome that can be incorporated into the routine surgical training.

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Learning Curve for Laparoscopic Appendectomy Performed by Residents According to the Grades: A Prospective, Non-randomised Controlled Trial

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Aims: To investigate the learning curve (LC) for laparoscopic appendectomy of surgical residents according to the grades using multidimensional statistical methods.

Methods: From October 2015 to November 2016, 150 patients underwent laparoscopic surgery by three residents (1st, 2nd, and 3rd grade, respectively) under supervision of professors. The patients were non-randomly assigned to each resident according to their availability and duties. The LCs were evaluated by the moving average method and cumulative sum control chart (CUSUM) for operation time (OT), and CUSUM for surgical completion.

Results: The mean age of all patients was 40.9 years old, and 78 (52%) were male. Baseline characteristics and perioperative outcomes were similar except for the location of appendix among the three groups. The moving average method for OT showed the generally tendency to downward for all residents. CUSUM for OT showed that the peak points occurred at the 24th, 18th, and 31st cases for resident A, B, and C. In terms of surgical failure, resident A, B, and C reached steady states after 35th, 11th, and 16th cases. Although the 3rd grade resident showed the latest LC for OT (31st cases), OT was similar among the three residents (43.9 min, 45.3 min, and 48.4 min for A, B, and C, respectively). The 1st grade resident showed the latest LC for surgical completion (35th cases). Basal perforation of appendix was a risk factor for surgical failure.

Conclusions: The LC for LA by residents was 11–35 cases according to multidimensional statistical analyses. The accumulation of surgical experience of residents might affect the LC, especially for surgical completion rather than for OT. Experience of surgical assistance as well as experience of surgical performance might be helpful to improve the surgical completion.