

Effectiveness of follow shot video in general surgery clinical clerkship.

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Abstract

Background: We aim to assess the effectiveness of integrating follow shot video of real cases into Case Based Learning (CBL) during general surgery clerkship.

Materials and methods: For representative cases, we took the follow shot of all the process from patient's admission to discharge. 76 students were randomly divided into experimental group and control group. Experimental group took CBL with follow shot video and control group took CBL only. After the teaching session, students filled designed questionnaire.

Results: Compared with the control group, experimental group show improved interest, faster reception of the theories, improved clinical thinking and analysis abilities, better doctor-patient communication, etc.

Conclusion: Follow shot video brings advantages to CBL and improves its effectiveness. Follow shot video is recommended to clinical clerkship.

Keywords: Case based learning, Follow shot, General surgery, Clinical clerkship.

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Introduction

Clinical clerkship is an integral part of medical education. On one hand, it improves the effectiveness of teaching theories in the classroom; on the other, it facilitates the smooth transition to the subsequent residency training. Clinical clerkship widely uses the Case Based Learning (CBL) teaching approach, which dissects the clinical cases representing particular areas of the curriculum based on the principles of problem-based learning. As a common teaching approach of the bridging stage of medical education, CBL could be traced back to the end of the 19th century. The landmark is the first collection of management cases by Malvin in 1921. It was initiated by Harvard business school and carried out in the form of group discussion on select cases. This was adopted by medical education in 1980s [1]. Shifting the teaching environment from classrooms to hospitals, CBL requires students to solve real problems by using acquired textbook knowledge and through group discussion on prepared clinical cases. In addition, students widen their horizon and gain the cutting-edge knowledge in the field through conducting research and reviewing literature. The main components of this teaching method include: 1) the instructor selects typical cases based on the syllabus and content of the course and arranges the clinical visits; 2) the instructor facilitates the group discussion on the diagnosis and treatment plan based on the information obtained through clinical visits and literature review; 3) the instructor summarizes the discussion and conclusion, and provides advice on further improvement. This teaching method combines the

theories and real cases, transforming teaching from "monotonous instruction" to "interactive discussion," and therefore improving the overall effectiveness of teaching [2-4].

As the fundamental subject of the surgery system, general surgery deals with a variety of diseases, complex diagnosis, and severe illness, this typically involves high risks. How to effectively transfer the knowledge and skills to students remains a challenge in the Department of Surgery. With our CBL teaching experiences of many years, we find the shortcomings of combining CBL teaching with real clinical situations. Feedbacks from students include the difficulty of gaining a holistic understanding of certain diseases and the fragmentation of learning physiological and pathological processes. During our teaching session in 2015, we edited episodes of TV series that represent characteristics of certain diseases in order to facilitate students' recognition of certain illness's characteristics, and unexpectedly found students showed keen interest and passion in the group discussion. The discussion even extended to outside of classroom. These TV series were produced for general audience of little medical knowledge, not specifically for medical trainees. We wondered whether CBL plus the follow shot from a physician's perspectives could achieve a better outcome than the traditional CBL.

To that end, we selected typical medical cases and follow shot videos from the patient's admission to discharge from the hospital. The videos were edited, denoted, and subtitled. We recapitulated the key knowledge related to the disease,

explained the rationale for the treatment, and recorded the whole surgical procedures. The edited video was played after students' ward visits and before the group discussion. The outcome was analysed and evaluated.

Subjects and Methods

Subjects

76 undergraduate medical students who entered Xiangya Medical School of Central South University in 2012 for general surgery clerkship were recruited and randomized into 2 groups. 38 subjects were included in the experimental group and the rest 38 subjects in the control group (Table 1).

Methods

Representative cases were selected from the wards and discussion items were created according to the curriculum and course syllabus. For each case, medical history was recorded and physical examination was performed by students under supervision. Students in the control group received traditional CBL teaching. Students were encouraged to propose diagnosis and treatment plan, which were commented and rectified by the instructor as necessary. Students in the experimental group watched the prepared video made of follow shot cases and discussed the raised questions as diagnosis proceeded.

Teaching contents and preparation

The topics covered in this study are common diseases in general surgery, with Surgery (edited by Xiaoping and published by Renwei Press) as the textbook. Cases included in this study are "liver diseases", "biliary diseases" and "portal hypertension". Students in both control and experimental groups were led by the same experienced instructor from the Department of Surgery.

The instructor prepared the teaching materials according to the course syllabus and wrote the script for the follow shot video. The follow shot video comprises three parts: 1) the primary care physician collected medical history and performed physical examination in the outpatient/emergency department; 2) the attending physician collected detailed medical history, performed additional physical examination, and facilitated the process and interpretation of supplemental examinations; 3) the discussion of treatment plan with patients, treatment and rehabilitation. With written consent from patients, representative cases were follow shot by the course instructor and a photographer. After patients were admitted, the attending physician started to get involved in the follow video shot. Prior to the medical history inquiry and physical examination, the attending physician was recapitulated with the key knowledge that was supposed to be highlighted in teaching. The process of medical encounter, including consultation, was videotaped. All the examination results were recorded and compiled. With all the available information, the attending physician analysed the patient's case, proposed and discussed treatment plans with the patient. After the treatment plan confirmed, the process of

medical intervention or surgery, recovery from the procedures and discharge was completed and recorded. After all the follow shots, videotapes were edited by a professional videography editor. Subtitles and pertinent explanation were added, to improve the instructive quality of the video.

Implementation of the teaching method

Control group: Students in the control group were taught with the traditional CBL teaching method. Briefly, instructors specified the teaching contents and students prepared lessons prior to classes. The instructor selected representative clinical cases and instructed students to collect medical history and to perform physical examination under supervision. Further medical information was gathered from the patient's previous medical record. In the classroom, students reported collected information and discussed diagnosis, staging, and treatment plan for each case, with the instructor's facilitation. Questions included: "are the symptoms consistent with the CT data?" "What characteristics of contrast medium at different stages should be considered when interpreting CT data?" "How to choose the appropriate biliary tract angiography?" "The mechanism and progress of Terlipressinum decreasing portal hypertension," etc. The key points related to these questions were provided to students after the group discussion. The instructor led the discussion with special attentions to the relevance of the discussion with the cases, the scope and direction of the discussion. Students were encouraged to search relevant online information about the discussion after class. The instructor helped students to learn knowledge and skills through evaluating the patient reports and students' critical thinking ability, and through summarizing diagnosis and treatment with reference to the textbook knowledge.

Experimental group: Prior to the group discussion, students in the experimental group went through the same process as those in the control group. At the beginning of the discussion, the follow shot video was played. The video included three parts and group discussion was carried out after each part. The first part covered the whole process of collecting medical history and observing symptoms. Through watching this part of video, students were taught how to acquire information about certain diseases, what were the possible diagnosis and potential treatment strategy, what supplemental examinations were required, whether emergency treatment was needed—all of these questions are necessary to be considered in the emergency department. The instructor encouraged students to pay attention to the attending physician's questions and physical examination, and explained the reasons of doing things that way. Students were also encouraged to appreciate the humanity side of patients. The second part of the video was the major part of theories and knowledge that were highlighted by the instructor when preparing the script. In this part, the patient disclosed chief complaint and its progress, and recalled details prior to the incident. The patient also reported previous interventions and effectiveness, familial history of diseases, as well as positive and negative signs. The supplemental examinations were included. For specific examinations such as CT or angiography, prerequisite training was completed by all

students. This part of video contained the major topics for the group discussion. Students were prompted to independently propose diagnosis and reasoning based on the medical history, physical examination, and with the results from supplemental examinations. Students further analysed the pathological aspects of the cases. In the third part of the video, students compared their diagnosis and treatment plans with each other and discussed the pros and cons of strategies. Students watched the process of medical consultation and how to obtain informed consent. By understanding the process, students learned the key information that the attending physician delivered to the patient and practiced this process by simulated scenarios. The instructor further explained the preparation, planning, and process of surgical procedures.

Assessment of the teaching methods

Questionnaires: After the course, all student participants were surveyed by a specifically designed questionnaire. 38 questionnaires were distributed to the experimental group and 38 collected, with a recovery rate of 100%; 38 questionnaires were distributed to the control group and 38 collected, with a recovery rate of 100%. The questionnaire used a score scale of 0 to 9, with 0 being the worst and 9 the best. Students were asked to provide their genuine thoughts on their experience in the class. Questions included: 1) to what degree this course stimulated your study interest; 2) to what degree the teaching method helped you understand textbook knowledge; 3) to what extent this teaching exercised your clinical thinking ability; 4) how helpful was the teaching for your analysing skills; 5) how helpful was the teaching for your communication with your patients; 6) how helpful was this teaching prepare you for your clinical tasks; 7) to what extent this teaching helped your teamwork capacity; 8) what score would you assign to this course; 9) how much this course contributed to your future choice to enter general surgery specialty.

Statistical analysis

All data were analysed by using the SPSS 19.0 software package. Mann-Whitney U test was used to compare data from experimental and control groups. A p<0.05 was considered to be statistically significant.

Results

As shown in Table 1, compared with the control group taking CBL only, experimental group taking CBL with follow shot video demonstrated improved interest, faster reception of the theories, improved clinical thinking and analysis abilities, better doctor-patient communication, etc., suggesting that follow shot video brings advantages to CBL and improves its effectiveness.

Table 1. Data of the questionnaires from 2012 medical undergraduate students.

| | Experimental group | Control group | Statistics | |
|--|--------------------|---------------|------------|--|
|--|--------------------|---------------|------------|--|

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|-----------------------------|------------------|--------------|--------|-------|
| Subjects (M/F) | 38 (16/22) | 38 (17/21) | | |
| Age | 20.86 ± 0.74 | 21.11 ± 0.86 | -.763 | 0.445 |
| Study interest | 6.11 ± 1.11 | 6.74 ± 1.18 | 2.23 | 0.026 |
| Theories/knowledge | 6.47 ± 1.16 | 7.32 ± 1.32 | 2.83 | 0.005 |
| Clinical thinking | 6.73 ± 1.20 | 7.61 ± 1.08 | 3.07 | 0.002 |
| Clinical analysis | 7.13 ± 1.02 | 7.71 ± 1.11 | 2.40 | 0.016 |
| Communication skills | 6.68 ± 1.07 | 7.45 ± 1.13 | 2.81 | 0.005 |
| Clinical readiness | task 7.03 ± 1.03 | 7.63 ± 1.10 | 2.56 | 0.010 |
| Teamwork | 6.40 ± 1.15 | 7.05 ± 1.04 | 2.47 | 0.013 |
| Quality of the course | 6.26 ± 1.06 | 7.55 ± 1.01 | 4.63 | 0.000 |
| Choice of surgery specialty | 5.21 ± 1.88 | 5.05 ± 2.05 | -0.421 | 0.674 |

Discussions

CBL is the main teaching method used in the clinical clerkship in the Department of Surgery in our medical school. Although it has been practiced and constantly improved for years, the effectiveness remains less than optimal. 1) Authenticity: although all cases for teaching purpose are derived from the ward, instructors intentionally create representative cases perfectly matching curriculum. The teaching process is successfully achieved, but students’ classroom experiences are somehow different from the real cases [5]; 2) Representativeness As some medical cases are rare, the ward doesn’t always have all representative cases available for the teaching purpose, which might negatively affect the quality and consistency of teaching; 3) Completeness It is simply unrealistic for students to gain clinical diagnosis experiences on all cases in 4 studying hours. Videos and pictures are typically used to achieve the teaching goal, but the fragmentation of information on medical cases is not always helpful for students to appreciate the case from a holistic perspective; 4) Instructiveness follow shot videos plus group discussion could provide students with simulated experiences of real situations, helping students absorb knowledge faster and apply skills to real cases better.

In addition, there are two realistic problems to consider. First, due to the considerable tension built up between physicians and patients in Mainland China, some patients tend to repel junior medical trainees and refuse cooperation with them, even in the presence of the attending physician. This leads to mental stress of trainees and results in their extra cautiousness in the medical encounter. Second, for years instructors and students unintentionally pay great attention to the technical side of practicing medicine and ignore the psychosocial side of patients during the medical training; we believe that much more emphasis should be given to treating patients as individuals of wholesome, and communication skills are therefore crucial for medical practice.

How to effectively improve the CBL remains our priority. We tried to follow shot cases and presented the edited video to

2012 medical undergraduate trainees. We found this method could complement the current CBL teaching by providing real cases in its whole and presenting to students with full information. Students were able to apply knowledge and skills systematically and solve the real problems in the daily practice. In addition, the video fully displayed all the tasks that the attending physician carried out, including analysis of the case, communication and consultation with patients. This information is not readily found in the textbook and through shadowing physicians occasionally.

We found the experimental group showed higher participation rate and created more positive discussion atmosphere. In the first eight questions we asked, responses from the experimental group are significantly better than the control group. For the 9th question, no significant difference was observed between groups, which are consistent with our practical experience that students typically already have their career plan in mind prior to clinical clerkship and that is minimally influenced by the course.

Interestingly, students showed great interest in the group discussion and actively exchanged their thoughts on the medical history and examination results. According to them, the greatest reward of this learning was how to comprehensively gain medical information with key knowledge points in mind. In the follow shot video, the most interesting aspect to students was the supplemental examinations, which were used to confirm their initial diagnosis, strengthen their understanding of textbook knowledge, and improve their critical thinking and clinical reasoning skills [6,7]. Students also gained understanding on the supplemental examinations that was not covered in the textbook and only experienced by the attending or resident physicians. In addition, the instructor further led students to analyse the pathology, to critically evaluate the consistency between diagnosis and medical history/signs, and to assess the validity of diagnosis with supplemental examination results. As the discussion proceeded, students were encouraged to search additional online literature and continue exercise discussion. In general, students felt that the learning was of fast pace, high efficiency, and large amount of information. In addition, CBL was found to be effective and popular among continuing education and learning cutting-edge knowledge [8].

When discussing the communication and consultation process, students were invited to play the roles of physicians and patients so that students could gain perspectives of both sides. Students showed strong interest in this teaching method of simulated scenarios and reported a better comprehension on the medical encounter. Due to the nature of medicine, there is a clear trend of valuing technical skills over other aspects. We, however, believe that communication skills are as important as technical skills in practicing medicine. Studies show that general surgery is among the top three specialties with high rate of medical disputes, and 11.7% of medical disputes are due to miscommunication. Therefore, it is critical to teach students how to effectively communicate with their patients, in

order to train future physicians of excellent competency and to better serve the society [9].

Limitations

CBL supplemented with the follow shot video achieves better outcomes than the traditional ward visits in clinical clerkship. According to our literature review, follow shot video has not been used by any medical educational institution so far. The outcome of our study shows the advantage of this teaching approach, but further improvement is warranted. During the implementation, we noticed a few areas to improve upon. In order to improve the quality of the teaching material, we will collaborate with professional cameramen and video editors in videography and editing processes to better emphasize the key points and to make the video more visually appealing. In addition, with the complexity of medical cases in mind, it will take significant amount of time and effort to collect videos covering a range of cases. As the first trial of follow shot video as the supplemental material for CBL, further improvement upon designing the questionnaire is also warranted.

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