

# Video-based Clinical Anatomy Lectures for First Year Medical Students: A Novel Approach

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## Abstract

**Introduction:** Lectures are the main mode of delivering a large amount of information to the undergraduate students till date. Traditional anatomy teaching tends to focus more on details rather than its clinical relevance.

**Aims:** The objective was to make students competent in applying and correlating the anatomical knowledge with the clinical conditions and to use videos as an adjunct to teaching clinical anatomy.

**Settings and Design:** This study was a prospective and randomized study.

**Materials and Methods:** For this, two clinical conditions in teaching of the abdomen were selected. A total of 150 first year medical students were divided into two groups by lottery. Group 1 - study group (SG,  $n = 75$ ) and Group 2 - control group (CG,  $n = 75$ ). A pretest was conducted for both groups. SG received two interactive video-based clinical anatomy lectures along with traditional gross anatomy lectures (TGL) and dissection. CG received only TGL along with dissection. A post-test in clinical anatomy was conducted for both groups.

**Statistical Analysis:** Independent –“t”/Mann–Whitney test was used to compare the pre- and post-test scores within SG and the post-test scores between groups.

**Results:** There was a statistically significant ( $P < 0.001$ ) difference in the mean post-test scores of the two groups and also in the pre- and post-test scores of SG students, which demonstrates that video-based clinical anatomy lectures are effective in enabling students to correlate anatomical with clinical information.

**Conclusion:** Interactive, video-based clinical anatomy lectures are effective in enabling students to correlate anatomical and clinical information.

**Key words:** Clinical anatomy, Lecture, Medical students, Video

## INTRODUCTION

Anatomy is regarded as the cornerstone of medical education. A sound knowledge of anatomy is utmost vital for surgeons and also for other medical professionals for examination of a patient, diagnosis, for undertaking interventional procedures, and also for carrying out imaging techniques.<sup>1</sup> There are several challenges faced

by the curriculum planners in anatomy education such as reduced teaching hours, technological advances, cost involved in the purchase of cadavers, need for interactive learning, integration with clinical subjects, and reduction in the number of teaching faculties. This has led to remodeling of the mode of instruction of the subject to the medical students.<sup>2</sup> Lectures are the main mode of delivering a large amount of information to the students till date. Traditional anatomy teaching tends to focus more on the details rather than its clinical relevance. There are several rewards of learning anatomy with clinical relevance and multimedia sources.<sup>3</sup> The use of videos to teach anatomy stimulates student's curiosity in learning the subject and also for clinical application of anatomical facts and helps in choosing surgery as a potential professional path.<sup>4</sup>

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Hence, we hypothesized that a modified lecture format which will make students competent in applying and correlating anatomical knowledge with clinical conditions will be beneficial to the students. The objective of this study was to make students competent in applying and correlating the anatomical knowledge with the clinical conditions and to use videos of clinical conditions in lectures as an adjunct to teaching clinical anatomy. We therefore proposed to develop, implement, and evaluate video-based clinical anatomy lectures for first year medical students.

## SUBJECTS AND METHODS

In this study, 150 first year MBBS students of 2014-2015 batch of Meenakshi Medical College Hospital and Research Institute, Enathur, Kancheepuram participated. This study was a prospective and randomized study (randomization by lottery method). Institutional ethical committee clearance was obtained. The details of the study were explained to the students, and a subject information sheet was given to them, and following this, informed consent was obtained from the participants.

150 first year MBBS students were divided into two groups of 75 each by lottery method. Group I was the study group (SG) and Group II was the control group (CG). The study was carried out during the gross anatomy teaching of the abdomen. Two clinical cases (inguinal hernia and hydrocele) were selected for the video-based clinical anatomy lectures. Model lesson plans, power point presentation, case study, pre-and post-test questionnaire, and a validated feedback questionnaire were prepared. Both the SG and CG students received the traditional gross anatomy lectures (TGL) and dissection on the gross anatomy of corresponding selected clinical cases, i.e., inguinal canal, male external genital organs. Both the group of students were given a pretest in clinical anatomy for each lecture. After this, the SG students received video-based clinical anatomy lectures (inguinal Hernia and hydrocele). These lectures were for 45 min each and were divided into multiple interactive segments. These lectures started with an introduction through a case study, followed by briefing of the relevant gross anatomy with questions, followed by clinical features of the selected clinical condition and a discussion on the given cases. A video demonstration of the case was shown with explanations at the end of the lecture followed by discussion. These lectures were made interactive by the use of clinical case study with discussion of the case, videos of the clinical case, buzz group, think, pair, and share, in which students were given a task to complete by pairing with the student next to him/her and finally share the answers with the large group. When SG students were exposed to the new teaching method, the CG students were given revision

of the corresponding topic in dissection hall. A post-test in clinical anatomy was given to both the groups for each lecture. A feedback questionnaire was given to the SG students to get their responses on the new teaching method.

The pre- and post-test scores for both the groups for each lecture were tabulated and were statistically analyzed.

### Statistical Analysis

Independent –“t”/Mann–Whitney test was used to compare the pre- and post-test scores within SG and the post-test scores between groups.

## RESULTS

Following are the results of this study:

1. Comparison of post-test scores between groups - independent –“t”/Mann–Whitney test.  
When the post-test scores of the study and CGs for each lecture were analyzed using independent *t*-test/Mann–Whitney test (Table 1), it showed that there is a significant difference between SG and CG students for both the lectures with a  $P < 0.001$  which is statistically significant. This shows that SG students performed better than CG students when post-test scores of both were compared.
2. Comparison of pre- and post-test scores within SG - independent –“t”/Mann–Whitney test.  
When the pre- and post-test scores of the SG for each lecture were analyzed using independent *t*-test/Mann–Whitney test (Table 2), it showed that there is a significant difference between the pre- and post-test scores of SG students for both the lectures with a  $P < 0.001$  which is statistically significant. This shows that SG students performed better in the post-test compared to pretest.

**Table 1: Comparison of post-test scores between groups - independent–“t”/Mann–Whitney test**

Post-test	Mean±SD		Significance
	SG	CG	
Inguinal hernia	6.04±2.84	3.62±1.79	0.000
Hydrocele	3.43±1.04	1.24±0.78	0.0

SG: Study group, CG: Control group, SD: Standard deviation

**Table 2: Comparison of pre- and post-test scores within SG - independent–“t”/Mann–Whitney test**

SG	Mean±SD		Significance
	Pretest	Post-test	
Inguinal hernia	2.88±1.54	6.04±2.84	0.000
Hydrocele	0.92±0.67	3.43±1.04	0.000

SG: Study group, SD: Standard deviation

3. Analysis of feedback questionnaire.

From Figure 1, it is evident that 95% of students have agreed, strongly agreed, or very strongly agreed to the feedback items 1-6.

Following were the open-ended questions and responses of the SG students for the feedback questionnaire.

Question 1 focuses on the process of lecture (interactive), question 2 focuses on the content of the lecture, and question 3 on the use of videos in lectures.

1. List the effects of traditional lecture method and the new teaching method on your learning.

The responses of students on the effects of traditional lecture method and the new teaching method on their learning are:

Students responded that the TGL are monotonous and vague, there were no opportunities to interact and were difficult to understand. On the other hand, the new teaching method (interactive lectures) was more interesting, thought provoking, and made them more attentive, and there were opportunities to interact.

From the above responses, it is clear that SG students found the new teaching method (interactive lectures) more interesting, interactive, and thought provoking as compared to the TGL.

2. List the ways in which the traditional lecture and the new teaching method affected your understanding of the clinical conditions.

The responses of students on the ways in which the traditional lecture and the new teaching method affected the student's understanding of the clinical conditions are as follows.

Students responded the TGL do not emphasize on the importance of clinical anatomy, clinical anatomy is explained only superficially, and it was difficult to apply anatomy concepts. On the other hand, the new teaching method (clinical anatomy lectures) gave a clear understanding of the clinical condition, more emphasis was given to clinical anatomy, and they felt that they are able to correlate anatomical knowledge with the given clinical condition. From the above, it is clear that SG students found the new teaching method (clinical anatomy lectures) helped them understand and correlate anatomical knowledge with the given clinical condition as compared to the TGL.

3. Do you think the use of video in lectures helped you learn better? If yes, how? If No, why?

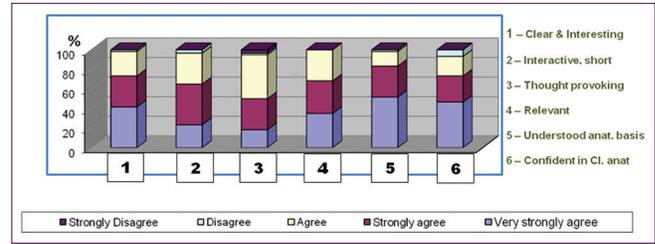


Figure 1: Overall rating of lectures

The responses of students are that the use of videos of clinical cases was very helpful in understanding anatomy, made them learn not only anatomy better but also the clinical application of anatomy in a better way. They also felt that visual learning is thought provoking and the knowledge gained on the clinical cases will be very helpful in for clinical years.

**DISCUSSION**

This study showed that a video-based clinical anatomy lectures, which was also interactive, were beneficial to the students as are evident from the higher post-test scores of SG students as compared to CG students who were only exposed to TGL. TGL tends to focus more on minute anatomical details, thus giving less emphasis on the clinical correlation of the topic under the study. Students when exposed to clinical anatomy lectures in an interactive way complemented with relevant videos, showed more interest, are motivated, and learn better as seen from the feedback obtained from students.

The Medical Council of India in its vision 2015 insists on early clinical exposure in the first year of medical school itself.<sup>5</sup> This study is in accordance with the guidelines laid by MCI in this aspect as we have introduced clinical cases in the first year itself by making use of a paper case and video.

Drake<sup>2</sup> introduced an innovative clinically oriented approach to anatomy teaching which involved three steps. In the first step, students previewed a clinical case, and in the next step, students gained basic anatomical knowledge about the case using textbooks and self-directed learning. In the last step, presentation and discussion of the clinical case were done by a clinician. In this study, we have used a lecture format for a large group of students by the introduction of a clinical case, reinforcement of anatomical knowledge, and discussion of the clinical case along with supplementation of a video demonstration on the clinical condition.

Clinical association lectures have been implemented, in which clinicians were asked to give a lecture, and when they helped students with problem-based case studies, it was

seen that when the clinician stresses the clinical relevance, the interest of the students was very high.<sup>6</sup>

As quoted by Gülpinar and Yegen that students who are engaged in active learning learn better than passive learners, a well-structured lecture can be thought provoking and can motivate students to learn leading to increase in critical thinking skills of the students.<sup>7</sup> In this study, we have implemented a well-structured clinical anatomy lectures which were divided into multiple interactive segments.

As quoted by El-Sayed *et al.*, video-based lectures are a good source for making students center their attention on the required details.<sup>8</sup>

Nikopoulou-Smyrni and Nikopoulos, in their studies, have opined that the use of short videos in lectures to teach have constructive force on student's motivation and concentration.<sup>9</sup>

Alnassar *et al.* concluded that the use of videos in gross anatomy teaching increases the students' interest in learning the subject and also helps them to apply anatomical concepts. They propose that this can be adjuvant to the traditional teaching and cannot replace the cadaver dissection.<sup>4</sup> Our study is in line with this study that video-based clinical anatomy lectures can be made supplement to the TGL teaching methods such as dissection, prosection, and TGL.

Integration of basic sciences with clinical medicine is very important in developing physicians who have clinically correlated facts and making them medical experts.<sup>10</sup>

Since lectures have a major role in teaching of anatomy to medical students, they cannot be replaced. Hence, the author suggests that the routine gross anatomy lectures can be supplemented with videos, clinically relevant anatomy,

and can be made more interactive so that students are motivated to learn anatomy and will be able to apply anatomical concepts when dealing with clinical cases in their clinical years.

## CONCLUSION

Hence, the authors conclude that interactive, video-based clinical anatomy lectures are effective in enabling students to correlate anatomical and clinical information, as well as being acceptable as a better method of teaching and learning.

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