

Conventional Microscopy V/s Static Image Display Method : Which is Better?- A Pilot Study.

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Abstract

Background: Histopathology is the study of changes caused by disease in tissues at microscopic level. Since decades, medical students are taught histopathology by light microscopy using conventional light microscopes. Virtual Microscopy is slowly replacing this conventional method.

Aims: To assess the usefulness of virtual static images over conventional teaching method using light microscopy and to know the perception of students towards these methods.

Methodology: Forty students of second year MBBS were made to identify 15 histopathology slides by two methods. One method used was conventional light microscopy and the other method used virtual microscopy and static image display method using PowerPoint. Scores obtained by students in each method was tabulated and analysed. Students feedback on both methods was collected.

Results: Mean of the total score obtained by students was 4.2 with conventional light microscopy and 3.65 for virtual microscopy method.

Conclusions: Difference in the scores obtained by students was not statistically significant. Majority of the students (70%) opined that conventional microscopy was their preferred method of choice.

Key words: Virtual microscopy, Static image display, Conventional microscopy.

Introduction :

Teaching medical students, microscopic morphology of various diseases by observation of tissue sections on glass slide using traditional student's microscope has been a longstanding practice of teaching pathology in medical school curriculum.

With the advent of technology, virtual microscopy with computer work stations and web microscope using digital slides are replacing the traditional student's microscopes.

Virtual microscopy is an emerging technology in histology/ histopathology education. The image acquisition involves taking digital microphotographs of tissue sections in different magnifications and tiling of images using software so as to enable them to be viewed on computers. Though, virtual Microscopy allows the students to examine entire tissue sections, this facility are lacking in most of the medical colleges¹.

Since decades, medical students are taught histopathology through lectures, followed by laboratory

sessions, where tissue section on glass slides are demonstrated under light microscope and then the students are made to see the slide on their own and draw microscopic diagram. Understanding of histopathology is assessed in the examination by one minute buzzer round format in which students are rotated through 10-20 microscope stations, to observe the focused slide and identify the pathology.

We wanted to replace this conventional method to virtual microscopy by projecting static images of microphotographs of various lesions using PowerPoint presentation. Before doing so, we did a pilot study to assess the usefulness of virtual static images over conventional teaching method and to know the perception of students towards these methods.

Methodology :

The study was conducted during regular pathology practical hours. Forty students of second year MBBS who consented to participate in the study were included. Students were divided in to two batches of 20 each and

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were allowed to identify 15 histopathology slides by conventional as well as by virtual static image display method which consisted of projecting microphotographs of lesion on a screen using PowerPoint slides and LCD projector. Students were familiar with these 15 lesions as they were taught about these lesions earlier and demonstrated. The test was conducted simultaneously in two halls with one batch seeing the glass slides by conventional method under light microscopy in one minute buzzer round technique while the other batch was made to identify the static images of microphotographs of the same slides projected on a screen. Each image was displayed for one minute. Students were asked to write their diagnosis in one minute. Each method was scored for 15, with one mark allotted for each correct diagnosis. The order of display of slides and images was different. The session lasted for 20 minutes with five rest stations and then the same was repeated after interchanging the batches.

Results

Scores obtained by students in both the methods were analyzed. Since students score of 50% is considered for passing in university exams; a score of 8 or more was considered to be satisfactory and were included as good performers. Students were then asked to give written feedback on the method which was helpful to identify the lesion, the choice of their preferred method and the reason for choosing that method

TABLE 1: STUDENTS PERFORMANCE IN BOTH METHODS

METHOD	>_8	<8	TOTAL	PASS %
Conventional	2	38	40	5
Static image	4	36	40	10
	6	74	80	

Proportion of good performers was 0.75 and proportion of poor performers was 0.925. Using Chi square test, P value was calculated which was not significant. (0.5)

Mean of the sum of total score obtained by all the students in each method was calculated. Mean score was 4.2 for conventional method and 3.65 for static image display method.

TABLE 2: SCORES OF BOTH METHODS

METHOD	TOTAL SCORE	MEAN SCORE
Conventional	168	4.2
Static image display	144	3.65

Seventy five percentage of the students (n=30) opined that conventional method was their preferred method. The advantage of this method was that they could move the slide to view other areas of the section and microscopic features were appreciated better.

Microscopy gave a closer view compared to static images (n=16, 40%).

Static image display on PowerPoint was a new method and was difficult to identify lesion. (n=24, 60%). Students who preferred static display (n=10, 25%) opined that PowerPoint projection was better as images were clear and image of the exact lesion was focused.

Discussion

Examination scores and evaluation indicate that virtual microscopy significantly improved learning efficiency and performance. In addition, virtual microscopy has many advantages compared to conventional method which is listed below.

It reduces the cost and maintenance of microscopes. Providing each student with a light microscope and maintenance of microscopes is definitely costly. In comparison, one microscope with a digital camera for capturing image with a computer is more economical.

It provides an opportunity for all students to view the image in one sitting which could be demonstrated by a single teacher in contrast to small group teaching using conventional method where many faculties are required.

It overcomes the difficulty encountered by many students in handling microscope, identifying the area of diagnosis. Breaking of slides while in tension during examination and routine handling of slides, loss of slides can lead to frustration in the students. In addition, staining of tissue section fades as slides become old and requires restaining or preparation of new slides.

There is a difficulty for many medical schools to get general pathology slides. This is overcome by virtual microscopy as it is easy to get image of any disease from internet/web resource with prior consent from the authority to avoid plagiarism.

There are still many more advantages which have made few medical schools to adopt this method for teaching histopathology as well as for assessment. The methodology was changed over a period of time giving ample time for students and teachers to get accustomed to the new method.²

Previous studies administered to students and faculty indicate that virtual microscopy was favorably received.³

Present study indicates that null hypothesis holds true and there exists no difference between the two methodologies. The new methodology has to replace the conventional method gradually.

Reason for majority of the students to prefer conventional method is that it was a familiar method since histology in first year MBBS was taught in a similar manner and each student is provided with a good quality microscope in our medical school which is

helpful for observing the lesions clearly.

Both the methods have their own merits and demerits which influence the medical schools to choose the method. Though there was no significant difference between the two methods in our study, merits of static image display is reported to outweigh the merits of conventional method⁴

Students score was considered to assess the usefulness of the method based on the fact that they identify the lesions if they are able to appreciate the microscopy.

Kumar R K et al have described about successful implementation of virtual slides for teaching microscopic pathology and its usage in summative assessment. There was no difference in the students' scores using either virtual slide or glass slide for a given case. According to them, students and faculty readily adapted to the use of virtual microscopy. Questionnaire feedback from students strongly indicated that virtual microscopy was a better method, solving many problems during learning in addition to providing good and excellent image quality. The high quality learning resources such as virtual slides ensure that microscopic examination of tissues remain both meaningful and interesting. A distinct lack of affection for microscopy even if they recognize its importance and difficulty in relating what they see in the microscope with what the teacher demonstrates were the difficulties that students faced with conventional microscopy. They tried to overcome these by the new attempt.⁵

Limitations of the study are that students score alone cannot be taken to assess the two methodologies as there are other factors which influence their performance. It is advisable to include a large sample size to arrive at proper conclusion based on student's performance.

This study included only static image display method but with the advent of technology, new methodology needs to be adapted for teaching histopathology. Virtual microscopy, computer work stations and digital images provide opportunity for students to view them at different magnifications, zoom, see whenever they want, and also have the copy of the same in their computer for reference and to learn better.

References :

1. Blake C A, Lavoie H A, Millette C F. Teaching Medical Histology at the University Of South Carolina School Of Medicine: Transition to Virtual Slides and Virtual Microscopes. *The anatomical record* 2003; 275:196–206.
2. Szymas and Lundin: Five years of experienceteaching pathology to dental students using the WebMicroscope. *Diagnostic Pathology* 2011 6(Suppl 1):S13.
3. Krippendorf B, Lough J. Complete and Rapid Switch From Light Microscopy to Virtual Microscopy for Teaching Medical Histology. *The anatomical record*; 2005:19-25.
4. Weaker F J ,Herbert D C. Transition of a Dental Histology Course from Light to Virtual Microscopy. *J Dental Edu.*2009;73:1213-21.
5. Kumar RK, Velan GM, KorellSO, Kandara M,Dee FR, Wakefield D. Virtual Microscopy for learning and assessment in Pathology. *J pathol* 2004;204:613-8.

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