Letter to Editor

Role of modern teaching aids and technologies in Ophthalmic teaching

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Dear Editor,

Clinical teaching in Ophthalmology is a big challenge. In the words of a senior professor, "I still remember those days when I used to be an undergraduate student of medicine in 1964-67 and later on as a post graduate in 1968-71, there used to be a batch of twenty to twenty-five students for OPD or indoor clinics for case presentations. The case was being shown on the indirect ophthalmoscope or slitlamp or in the operation theatre. Since it was not possible that all the students could see the patients individually by torch or on slitlamp or on any other device, therefore we had to rely most of the time on the statements of our teachers." Now the scenario has entirely changed. All the equipments are attached with electronic devices and projection on computer monitor or much higher magnification, with the help of LCD projector, to larger group of students is possible. Thus, Ophthalmic teaching has become much easier and simpler because the teachers and the students see and discuss the same things together, at the same time. There is no need of giving the false consent of understanding when one has not comprehended what is being taught.

Modern equipment's that couple as teaching aids

1- Audio visual devices in smart class rooms
2- Photo slitlamps attached with computer and LCD projector
3- Indirect Ophthalmoscopes with monitor
4- Fundus cameras with computer and monitor
5- Optical Coherence Tomogram (OCT) with monitor

In addition to the above tools, teaching friendly operation theatres, teleclasses as a part of tele-Ophthalmology and internet library and journals have generally transformed both undergraduate and post graduate teaching in medicine, especially in Ophthalmology.

Audio visual devices in smart class rooms

In the past, classrooms were simple rooms with a black board on the front wall and a dais for the teacher to stand. Today's modern classes are well equipped with whiteboards and projection screens. LCD projectors are linked with computer, internet and other teaching aids. The walls are mounted with speakers and mikes, so everything is visible and audible. Instead of pointer sticks, we now use laser pointers, to pinpoint the object of interest. We do not need to draw diagrams with chalk, but here we project real pictures, live surgeries or procedures in the classroom. This makes it easier for the students to comprehend what is being taught.

Photo slit lamp with computer and LCD projector

In the outpatient department (O.P.D) or in classrooms, we have photo slit lamps attached with computer and LCD projectors. With this, one can project any lesion from the lid to the retina (Figure-1), with the use of accessory instruments like gonioscopy, applanation tonometer, 90 D lens etc, either on a monitor or a class room screen and demonstrate all micro findings to a group of students or the whole classroom very easily. We can also store the relevant findings, which are rare in occurrence and can present them whenever required in the future, in addition to providing good clinical material for research work.

Indirect ophthalmoscope with monitor

In olden days, demonstration of retinal lesions to students was very difficult, as with the use of the teaching mirror of the indirect ophthalmoscope, most of the time students missed the important findings which were specified by the teachers. One indirect ophthalmoscope was usually mounted with two teaching mirrors, so at a time only two students were able to see the fundus along with the examiner. Due to different angles of examination, practically it was impossible for a teacher to show the findings to a group. In modern days, the indirect ophthalmoscopes are attached with monitors (Figure-2) which show the pictures as observed by the examiners and are simultaneously projected on the monitor, so various lesions like lattice degeneration,retinal breaks, haemmorhages, drusens, retinal detachment, retinal and vascular changes are very clearly visible to a group of students. During examination, the findings can be paused or recorded, so they can be demonstrated or re-played in the future.

Fundus camera with computer and monitor

Old fundus cameras were non digital cameras, thus during the procedures like fundus photography and FFA , only the examiner was able to observe the findings as time was needed to develop the film till it could be visualized by a group. Now digital binocular and digital cameras are present to complement the monitor and the computer (Figure-3). As a result, number of students can observe the fundus photographs simultaneously, and discuss the findings altogether. The photographs can also be stored and reused in the future. Dynamic colour pictures of FFA can now be observed in the monitor, and may be magnified according to need.

Optical Coherence Tomogram with monitor

The diseases of retina and choroid are very difficult to recognise because one structure overlaps with the other. To assess the involvement of various layers of the retina and choroid, the OCT {(Huang D et al. (1991); Sull A C et al. (2010)} is now being routinely used (Figure-4). It is a non-invasive imaging technique and provides high-resolution, cross-sectional images of the retina, the retinal nerve fibre layer (RNFL) and the optic nerve head. This device cuts the sections of the desired structure with precision, so that visualising the depth of the involved layer is possible. Simultaneously the machine is attached with a monitor, so these images can be visualised clearly by a group of students when demonstrated in a classroom.

Teaching friendly operation theatre

Operation theatres need completely aseptic conditions. Therefore, in the past the only way to learn operative procedures was to assist the senior surgeons. As in some micro surgeries, like Ophthalmology, the observation of the steps of surgery was a difficult procedure. As Operation theatres are sterile zones, teaching a group of students was quite difficult. Now in the modern era, the scenario has changed in a progressive manner. Operating microscope with side teaching tubes, mounted with digital camera, has made teaching easy. The whole surgery can now be projected on a monitor in any other room or be telecast in the classrooms, situated far away from the operation theatres. The pictures and dynamic steps are projected with clarity, exactly the way the operating surgeon observes it in the microscope. The whole surgery can be recorded as well for future teaching.

Tele classes, electronic journals and books

As mentioned above, the classes are not only smart and teaching friendly, but also tele-classes. Just as tele-Ophthalmology {Kennedy C et al.(2001); Kumar S et al. (2006); Verma M et al.(2009)} enables health professionals to take ocular images and attend to patients who have limited access to ocular health care, tele-classes use the same equipment for purpose of teaching students. The required equipment includes a camera that can take ocular images and a computer terminal with network capabilities, which can transfer the images. With the help of the modern equipments and internet, now renowned experts can make live webcasts of their classes across the world. They can telecast their cases, lectures and surgeries and these classes harbour the facility of multi way communication with one another, enabling active participation and discussion. In addition, the role of electronic journals and books cannot be denied in medical teaching and research. In the past, it was very difficult to do research and publish papers, due to difficulty in obtaining articles for referencing. Students were dependent on the books, which were accessible to them from the local libraries, friends and teachers. Now most of the books and journals, national or international are just a click away, enabling quick publication of research articles.

Figure 1: Examination of anterior segment on photoslit lamp with monitor

Figure 2: Examination of fundus on indirect ophthalmoscope with monitor

Figure 3: Examination of fundus with modern fundus camera

Figure 4: Examination of retina with OCT

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