Abstract

Purpose: To introduce a novel pragmatic tool (FLASH BOX) to help students learn, practice, and improve surgical skills during postgraduate curriculum in ophthalmology, especially small incision cataract surgery (SICS). Materials and Methods: Surgical training and transfer of surgical skills to the ophthalmology residents who will be our future lineage is the need of a good residency program. Animal eyes, postmortem human eyes, simulators, devices, teaching tools such as Kitaro dry lab and wet lab system kit are currently available to learn and practice surgical steps. Their availability in teaching institutes is really grueling. Flash box is a simple intraocular lens box freely available in each operation theater in all set-ups and can be used freely to learn and master various steps of SICS. Results: Practicing on Flash box allows residents to get familiar with various surgical steps, operating microscope, and ophthalmic microsurgical instruments in a stress-free environment and helps to nurture surgical skills in residents. Conclusion: Flash box will help in the transformation of the surgical mindset of residents and can be a very helpful option for learning surgical steps of various ophthalmic surgeries.

Keywords: Flash box, postgraduation training in ophthalmology, residency in ophthalmology, small incision cataract surgery, surgical skill, surgical skill transfer

Introduction

A resident who is capable of performing various surgeries with confidence and skills after postgraduation in ophthalmology is the priority for our profession and the public. However, the complexity of ophthalmic surgery remains a challenge for trainers to transfer skills. What should be our strategy, one such as teaching a language or learning to play a sport? Observe-assist-perform and wet lab learning - practicing (WLLP) are two models of surgical training.

Observe-assist-perform

Here a period of observation followed by gradually increasing participation. Assisting surgeries then performing different stages of an operation under supervision of a senior surgeon.

Simulation (wet lab)

Training before actual performance (WLLP), prior exposure to wet lab, gives trainee the chance to develop skills before being exposed to real patients. Miller’s hierarchical triangle emphasizes four levels of learning from base to pinnacle - knows, knows how, shows how, before reaching the final stage of “Does.” Thomsen identified four different groups of simulation models, animal, cadaver, inanimate, and virtual-reality models. They help in acquisition and execution of both motor and psychomotor skills and reduce the learning curve of the novice surgeons. Residents develop tissue awareness, dexterity, and muscle memory required to perform each step of the procedure.

Apart from a couple of institutions, ophthalmology residents in India and in the developing world do not have access to wet labs and computerized virtual-reality training systems. Constraints of space, availability of practicing material, their cost and nonrenewable type, and handling and disposal of used tissue plus high cost of simulator are the limiting factors.

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How to cite this article: Shukla A, Gupta P. Flash box - A pragmatic tool to hone surgical skills of residents during postgraduate curriculum in ophthalmology. TNOA J Ophthalmic Sci Res 2020;58:17-9.
Need for inventing resources

To overcome limitations of conventional training and wet lab models, using animals and human cadavers, we should keep inventing new resources. “What could be done better, efficiently and more safely” If a skills laboratory \(^1\) is not available, then the operating microscope can be used when the operating theater is not in use. Only plastic eyes or other nonorganic material should be used in the operating theater. Pieces of fruits such as grapes and tomatoes are useful for practicing capsulorhexis, suture practice to increase eye

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**Figure 1:** Flash box - Paper box of intraocular lens (IOL box)

**Figure 2:** Practicing side port making

**Figure 3:** Gelatin wrap over the box is advantageous in practicing making of conjunctival flap

**Figure 4:** Practicing tunnel making

**Figure 5:** Flash box can be used for teaching and practicing irrigation and aspiration with simcoe cannula

**Figure 6:** Practicing intraocular lensimplantation
hand coordination under the operating microscope. Once the microscope and instruments have been mastered and the trainee is comfortable using them, progress will be much more rapid in the operating theater.

Purpose
To introduce a novel pragmatic tool (FLASH BOX) to help students learn, practice, and improve surgical skills during postgraduate curriculum in ophthalmology, especially small incision cataract surgery (SICS).

Materials and Methods
Surgical training and transfer of surgical skills to ophthalmology residents who will be our future lineage is the need of a good residency program. Animal eyes, postmortem human eyes, simulators, devices, and teaching tools such as Kitaro dry lab and wet lab system kit are currently available to learn and practice surgical steps. Their availability in teaching institutes is really grueling. Flash box is a simple intraocular lens (IOL) box (paper box with gelatin layer) discarded after using IOL, can be used for surgical training of residents as freely available in each operation theater in all set ups, and can be used freely to learn and master various steps of SICS [Figure 1]. On clear part, one circle is drawn with marker pen to represent limb us; further, marking clock hour’s 3, 6, 9, and 12 will help in learning orientation [Figure 2].

Gelatin wrap over the box is advantageous in practicing various steps; making of side port, injecting viscoelastics, dye, making of conjunctival flap; and explaining limbal/ fornix-based flaps [Figures 3-5]. After removing the gelatin wrap from IOL box the remaining paper box can be used for practicing tunnel making. Practicing a frown shaped incision, tunnel dissection with crescent and entering the anterior chamber with keratome [Figure 4]. Flash box can be used for teaching and practicing other steps also such as simcoe aspiration [Figure 5] and IOL implantation [Figure 6]. As flashcard is one of the teaching tools, this paper IOL box is named as “FLASH BOX.” A good set of instruments should be set aside for practice. All trainees should have their stereopsis and corrected visual acuity checked before using microscope. Resident can learn how to hold instruments, what a particular instrument is for, and cultivate manual dexterity by practicing various surgical steps, specially SICS on FLASH BOX. As flashcard is one of the teaching tools, this paper IOL box is named as “FLASH BOX.”

Results
Practicing on Flash box allows residents to get familiar with various surgical steps, operating microscope, and ophthalmic microsurgical instruments in a stress-free environment and helps to nurture surgical skills in residents.

Conclusion
Flash box is easily available at no cost, safe to use, and discard and can be used n number of times. It will help in the transformation of the surgical mindset of residents and can be a very helpful option for learning surgical steps of various ophthalmic surgeries, especially in institutes where wet lab facilities and virtual-reality training not available.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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