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LETTER TO EDITOR

Process of launching wet lab to perform cataract surgery on goat's eye

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Dear Editor

The process of launching a wet lab to perform cataract surgery on goat's eye was presented for publication and use of respectable surgeons of the ophthalmology department in this study.

In order to design an effective and beneficial wet lab, five main steps were followed and implemented as follows:

Step 1: Preparing an appropriate physical space

To have proper wet lab space, a room in Feiz Educational-Therapeutic Ophthalmology Center, affiliated to Isfahan University of Medical Sciences, Isfahan, Iran, was considered and prepared. Therefore, after the preparation of cabinets, plumbing, cooling and heating equipment, electricity, and telephone system were set up in the room. The required facilities, including surgical microscope, phaco machine, microwave, trypan blue, extracapsular surgery set, phaco surgery set, safety box, refrigerator, desk, and chair, were transferred to this room.

Step 2: Obtaining finance to launch the wet lab

After coordination, we received and packed surgery sets using the old equipment from the operating room. Since modern equipment was purchased for the hospital operating room, we were able to transfer the phaco machine and microscopes that were no longer in use. Consumables and goat's eyes were not expensive, and a total of 30 goat's eyes were used.

In this physical space, a senior assistant performed the procedure step-by-step on a goat's eye, and a sophomore assistant followed the instruction as an observer and subsequently performed the procedure on the goat's eye. Other responsibilities in the wet lab comprised scrubbing, introducing ophthalmologic surgery devices and microscope set-up, and stitching.

Step 3: Providing goat's eye

To provide the eyes, a slaughterhouse (located at 60 km to Isfahan) was reminded to extract the eyes from the animal's eye orbit in a perfect form, along with the surrounding fat without touching the eye surface. The eyes were transferred to the wet lab in a cold box at -2°C inside the dextrose-saline solution. The temperature of the refrigerator was set at -2°C to keep the eyes. Nonetheless, the cornea should not be dried or frozen. Notably, as there was a long interval between the displacement of the eyes from the slaughterhouse and their use in the wet lab in cataract surgery, the eyes were kept and transferred in 2/3 and 1/3 serums at a temperature of -2°C in order to prevent corneal opacity.

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The goat's eye was selected given its resemblance to the human eye and accessibility (1). This similarity helps the researchers train the procedures to the assistants and enable them to practice on their own.

Step 4: Stabilizing the eye

In keeping with the need for eye fixation, the researchers used magnetic clip dispensers, as an innovative technique, to stabilize the eye. Bottom of the dispenser was filled with compressed cotton, and the eye was placed on it. The head of the dispenser was placed on the animal's eye so that the eye was accessible from the empty circular space of the dispenser head.

Step 5: Preparing the eye for cataract surgery

Given the fact the goat's eye is deprived of vital nerves at the time of slaughter, the pupil was dilated, and the eye was transferred under moist condition inside 1/3 and 2/3 serums at -2 °C in order to prevent from cornea's dryness and opacity. It was necessary to take certain measures on the goat's eye because the goat's eye lenses are made up of a loose transparent tissue. Therefore, to make it more solid and darker, we induced cataract in the microwave according to our previous studies.

It is necessary to state that cataract induction on the goat's eye was performed for the first time worldwide, and what was observed in previous articles (2, 3) concerned with the porcine eye was carried out at a power of 700 w in the microwave for 5-13 sec. In this study, it was observed that the goat's eye is different from that of the pig's and has a tissue that is more susceptible to microwave conditions that transform the porcine eye in a faster time.

Since cataract induction of the goat's eye in the microwave was the first experience there was no reference in this regard. The eye was checked in the microwave every 3 sec and observed within 9 to 13 sec at a temperature of 100°C. Total induction was accomplished, and the cornea was still transparent for practicing rhexis and phaco in the wet lab. In this way, the goat eye lenses were prepared for cataract procedures, including the anterior capsule, rhexis, phaco, irrigation and aspiration, intraocular lenses, and stromal hydration.

It was observed that the eye cataract could be used for surgical purposes up to 24 h after surgery in case they were stored inside a container with a lid under refrigerated conditions or in water. At these intervals, the necessary condition is required for the cornea to remain transparent, which was considered in the operational plan of the present study.

Keywords: Goat's eye, Ophthalmology, Surgery, Wet lab

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