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Anatomy

Lemon and Rod Model: An Easy Method to Teach Movements and Axes of Eyeball

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KEYWORDS :

Understanding the eye movements and various axes of eyeball is very important for a medical undergraduate to know the actions of extraocular muscles and testing the integrity of nerves supplying the muscles. But at the same time, it is very demanding for the teacher to make them understand and also give a correct concept regarding the movements even in a small group session such as demonstration .The different axes passing through the equator cannot be demonstrated while using a specimen or a plastic model. Also the eyeball cannot be rotated with all its axes. Active learning leads to enhanced learning. Engagement of the student is a key element making active learning activities work. Hence to help the students understand this concept, we have devised a cost effective and simple model using a lemon and rod to illustrate the various movements of eyeball.

The eyeball, the peripheral organ of vision is located in the anterior part of orbital cavity embedded in the orbital fat and separated from it by Tenon's capsule. The extra ocular muscles are inserted in the sclera of the eyeball to give it mobility so that the visual axis remains under neuromuscular control. This is essential for binocular vision and conjugate eye movements.The movements of eyeball include elevation, depression, adduction, abduction, intorsion and extorsion. The medial rotation (adduction) and lateral rotation (abduction) of eyeball take place around a vertical axis passing through the equator. The elevation and depression take place around a transverse axis passing through the equator. Intorsion and extorsion (moving 12o'clock position of cornea medially and laterally respectively) take place around the anteroposterior or visual axis. To demonstrate the movements and axes of eyeball to anatomy graduate students, a simple and cost effective model was used.

During the regular eyeball demonstration class for first year medical undergraduates, the batch of hundred students were divided into five groups. Each group had 20 students. A functional model of eyeball was prepared using a ripe lemon and a thin iron rod. The procedure was demonstrated in front of the students. The lemon was held in position and the anterior and posterior poles were explained to the students. The equator which lies midway between the two poles was shown to them. Using a permanent marker pen, the iris and pupil was marked at the anterior pole of the lemon. A black dot was marked to show 12o'clock position. The thin and narrow iron rod was passed along the equator to show transverse axis and the lemon was moved upwards and downwards to demonstrate elevation and depression as shown in FIG .1.

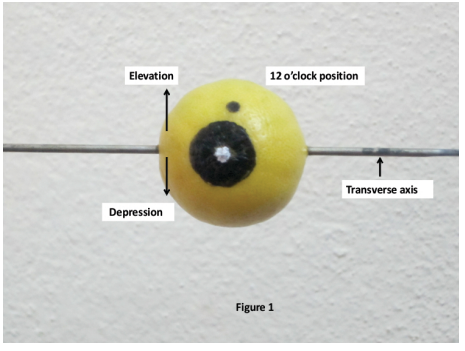

Fig.1: Demonstration of elevation and depression of right eyeball along a transverse axis. Black dot represents 12o'clock position.

Similarly, the iron rod was passed from above downwards through the centre (vertical axis) as shown in FIG.2 and the lemon was rotated medially and laterally to show adduction and abduction respectively.

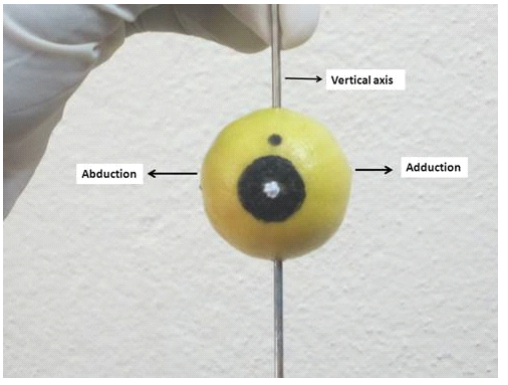

Fig.2: Demonstration of adduction and abduction of right eyeball along a vertical axis.

The anteroposterior axis was demonstrated by passing the iron rod from anterior pole to posterior as shown in FIG.3 and the lemon was rotated between the thumb and index finger. Movement of the lemon medially from 12o'clock position demonstrated intorsion and movement laterally demonstrate extorsion as indicated by the arrows in the picture.

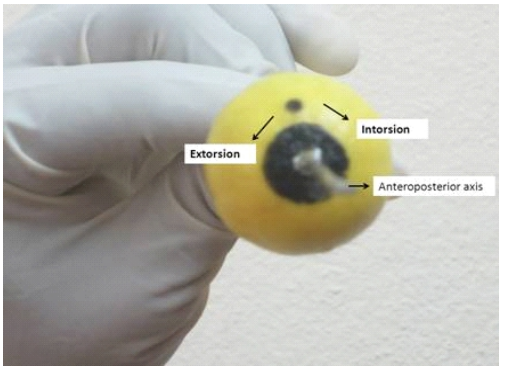

Fig.3: Demonstration of intorsion and extorsion of right eyeball along anteroposterior axis. Rotation medially from 12o'clock position demonstrates intorsion and rotation laterally from 12o'clock position demonstrates extorsion.

The session created a relaxed atmosphere among the students and was very satisfied with the demonstration. Transfer of information moved to be more interactive and flexible. The classes are more enjoyable when simple and interactive models are used to explain difficult topics. Demonstrations become more interesting and meaningful and gives the demonstrator immense satisfaction.

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