A simple model to demonstrate the movements and the axes of the eyeball

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It is very important for medical students to know the structure of the eyeball and understand its movement, the axes of movement, and the muscles producing these movements. It is indeed challenging to make students understand the movements and axes of movements of the eyeball in a didactic large-group lecture session; it is difficult even in small group teaching using an eyeball specimen or a rigid resin model. Here, we describe a simple model prepared using a tomato and a broomstraw to demonstrate the movements of the eyeball.

The eyeball is the organ of sight. It is spherical in shape and situated in the bony orbit. The movements possible for the eyeball are elevation, depression, adduction, abduction, intorsion, and extorsion. These movements occur along three axes, i.e., transverse, vertical, and anteroposterior. Elevation and depression occur along the transverse axis, adduction and abduction occur along the vertical axis, and intorsion and extorsion occur along the anteroposterior axis (1). A simple model was prepared to demonstrate these movements during demonstration classes.

During the eyeball demonstration class for medical undergraduates, the class of 125 students was divided into 6 groups of 25 students each. The eyeball specimen and models were demonstrated to them by six teachers. The students could not understand the movements and axes of movements when explained with the dissection hall specimens and resin models. A functional model using a ripe tomato and a broomstraw was prepared in front of them to demonstrate the movements. At first, the pupil and iris were marked on the tomato using a marker pen. The poles and equator of the eyeball were shown to them using this tomato. A broomstraw was passed from one side to the other, as shown in Fig. 1, and elevation and depression of the eyeball were demonstrated by rotating the tomato between the thumb and forefinger. The broomstraw represented the axis of movement, and the tomato represented the eyeball.

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Fig. 1. Demonstration of elevation and depression of the right eyeball along the transverse axis.

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

Fig. 3. Demonstration of intorsion and extorsion of the right eyeball along the anteroposterior axis.
In a similar manner, adduction and abduction occurring around the vertical axis and intorsion and extorsion occurring along the anteroposterior axis were demonstrated, as shown in Figs. 2 and 3, by rotating the tomato around the broomstraw, illustrating the axis of movement.

All the students in the group felt that the model was very useful for understanding the movements and axes of movements. Some of the specific comments were as follows: “Too good,” “I understood very well,” “It is so simple,” “I never thought it was so easy,” and “Please use such models for other topics too.”

The use of simple models like this could make students understand the topics easily. In the past, we have prepared and used some simple models to demonstrate the pelvic peritoneum (2), rotation of the midgut (3), and functioning of the pelvic diaphragm (4) successfully. We could prepare this model within a minute, right in front of the students, without spending much time or money. Just a tomato and a broomstraw is all that is needed. The student’s attention could be captured within a minute. This model could be used to demonstrate the movements of the synovial joints, such as shoulder joint, with some modifications. Simple yet innovative ways of teaching like this could not only make a topic interesting and memorable to students but could bring a lot of satisfaction and sense of achievement to teachers as well.

REFERENCES