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INTRAOCULAR FOREIGN BODIES

NATHANIEL R. BRONSON
Southampton, U.S.A.

Intraocular foreign bodies are a challenge, as each case is different. The patient has an injured eye, and extraction of this foreign body must be planned to do the least additional damage. On the average, I spend two or three hours evaluating each patient preoperatively, yet only twenty minutes in the operating room itself.

The patient's history is important, and often helpful clinical information can be obtained from this. Children may have to be questioned without their parents to find out what really happened. Of course, all the usual optical instruments should be used, including the slit lamp, the ophthalmoscope, and the gonioscope. One or more of these instruments may locate the foreign body, and even if this is not possible, may show what damage has been done and suggest the route of extraction.

There are, however, several special techniques of examination which are most helpful in the management of intraocular foreign bodies.

X ray will not only show the presence of most objects, but also indicate the size and shape. A soft-tissue ray will show a small object in the anterior segment of the eye. X-ray localization can be very helpful but also can be very misleading. This is particularly true in the Sweet's technique, where errors of 8 to 10 mm. are common. The Comberg method, or other localizing contact lenses, will generally give a much more accurate localization.

Metal locators are important in foreign body management, but the surgeon must know to use them. The preoperative examination of a patient with a metal locator will not only be helpful in planning the surgery, but will also refresh the surgeon's mind in its use. The Berman is an excellent

locator, although it is sensitive to the earth's magnetic field and must be constantly retuned while in use if the locator tip is angled even a degree or two. A few years ago, we introduced a metal locator which does not require retuning except for temperature changes. We have found this very helpful and easy to use.

Ultrasound has played a very helpful role in the management of foreign bodies. In most cases, the object can be easily seen, even in the presence of hemorrhage or cataract. These examples show the foreign body free in the vitreous. Notice that the vitreous is clear. Here the object is seen lying on the retina. Even an intralenticular location can be seen. Ultrasonic localization is very accurate, and, using a sterilized scan head, can be repeated in the operating room.

Equally helpful is the ultrasonic assessment of associated damage. With ultrasound, it is possible to tell if there has been retinal detachment or vitreous hemorrhage, and frequently the actual track of the foreign body through the vitreous can be seen. This is very valuable in planning the surgical extraction of the foreign body and in knowing what structures have been damaged or what reaction is present. It is also possible to determine whether the damage is so great that the eye is lost and enucleation is indicated.

All of these special diagnostic tools, ray, metal locator, and ultrasound, should complement each other, and the use of one does not exclude the others.

In 1966, we introduced a new eye magnet which has the actual pulling force of a giant magnet, yet is handheld. In the course of this development, we investigated the effect of different tip shapes on the pulling force on a foreign body. The long tip is certainly much more convenient to use surgically, but the blunt tip has a far greater pulling force. This is particularly important when an attempt is being made to dislodge a foreign body from the posterior pole. This magnet is pulsed, and the blunt tip strength goes from 10,000 gauss to 2,000 gauss every 0.2 seconds. This pulse mode has a dislodging effect on imbedded foreign bodies.

When using a magnet, it is very important to turn on the power for only brief periods. If the foreign body has not appeared after three or four seconds, it will never appear by continuing the application of power. Rather, the magnet should be placed so that it is closer to the foregn body;

for example, by indenting the eye further or moving further posterior, closer to the foreign body.

Preoperatively, we always use intravenous mannitol to reduce intraocular pressure, and in most cases where posterior extraction is planned, we remove the aqueous to further soften the eye. In this way, when the sclera is opened, there is much less chance of vitreous loss.

In planning a route of extraction, many factors are taken into account, and as we discussed earlier, each case is different. Frequently, we will use the pars plana approach, while at other times we will go directly over the foreign body. We have also used the anterior approach, moving the foreign body around the lens into the anterior chamber.

In the course of surgery, we will generally put cryopexy over any area where the foreign body has lodged or from where it has ricocheted. In addition, we will frequently put in a local buckle in an attempt to reduce the chance of retinal detachment.

This approach to an intraocular foreign body, with extensive preoperative evaluation and investigation to determine the size, the shape, the location, and the associated damage, is important in the management of intraocular foreign bodies. In this way, the amount of surgery needed to be done to an already injured eye can be minimized and the chances of a successful visual result improved.

SUMMARY

For the management of intraocular foreign bodies an extensive preoperative evaluation and investigation to determine the size, shape, location, and associated damage is important. For this purpose, at present the author uses special diagnostic tools such as X rays, a metal locator, and ultrasound; each one complements the other and the use of either of them does not exclude the others.

For the surgical extraction of these foreign bodies, he describes an eye magnet introduced by him in 1966.

C. B.