THE USE OF "CONTACT CORNEAL RINGS" IN X-RAY LOCALISATION OF INTRA-OCULAR FOREIGN BODIES

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THE Sweet, McGrigor or the recently described Kraus and Briggs methods of X-ray localisation (¹, ²) of intra-ocular foreign bodies seem to be the best, but they require special apparatus. So, in the present ophthalmic literature, we see a striving toward more simple methods. Most often metal markers applied to the globe show on X-ray films the relative position of the F.B.

The prototype of those methods was that given by Comburg (³). It requires a set of special contact glasses with metal marks. McGuise and Raffaetto (⁴) described a way of replacing those glasses with plastic materials obtainable from any dental laboratory. It is, however, a complicated and time consuming procedure. The serious disadvantage of Comburg's method is great difficulty in fitting contact glasses to eyes with swollen or lacerated conjunctiva.

More suitable for such cases would be the method given by C. W. Graham and described by Stallard (⁵), namely stitching a wire ring to the limbus; or Lautsch's (⁶) method of introducing four short silver wires under the conjunctiva (radially to the cornea, with their ends reaching the limbus). The latter methods require additional surgical manipulations which we should prefer to avoid in many cases.

The equatorial wire ring of Skeoch (⁷) does not give exact results, as its position depends more on the depth of the fornices than on the position of the eye-ball. The methods described by Lodge (⁸) can be used only in those cases where the vision of the wounded eye is well preserved, or where its movements are completely free.

Trying to find a way of avoiding those difficulties, I started to use thin flat metal rings exactly fitting to the corneal margin. I made such rings myself, taking for this purpose a lead and tin alloy, about 0.1 mm. thick (found, for instance, in the packing of dental X-ray films). The width of the rings is 1.5 mm. The external diameter varies for different eyes. I think five sizes—10.5, 11.0, 11.5, 12.0, 12.5 mm.—should be sufficient.

After cutting a ring out, I model it on an artificial eye with the finger-tips to get the proper shape, fitting it exactly to the eye convexity. When put on a previously anaesthetised eye the ring, thanks to its softness, corrects its minor inexactitudes itself, sticking to the corneal periphery by the force of adhesion. The external margin of the ring must correspond exactly with the limbus where

the corneo-scleral angle supports the ring, thus preventing it from sliding. In a closed eye the slight pressure of the lids aids fixation of the ring.

Thus, adhesion, support of the corneo-scleral angle and pressure of the lids keep the ring in place, even when the eye-ball moves. When the patient opens and closes his eyes, or when he moves his

FIG. 1.

Contact corneal ring (diameter, 12mm.).

FIG. 2—Side section.

Corneal contact ring fitted on eyeball.

open eye, the lid margin may dislocate the ring. This is the reason why, for the X-ray examination, I put a light dressing on the examined eye, to keep it closed during the procedure. To make sure that the ring keeps in its place with the eye movements, I let the patient change the direction of his eyes, with the examined eye closed, then I open slightly the eye in its different positions, to inspect it.

Such a ring gives a sufficiently distinct shadow on X-ray films to enable in the commonly known way (by making a diagram) the localisation of a F.B. from the relations shown by the postero-anterior and lateral X-ray exposures. Making two exposures on one film, in different positions of the eye-ball, may facilitate the localisation of the F.B.

The great advantage of "contact corneal rings" is that they are easy to prepare, to sterilise and handle; and that they can be used also in cases with lacerated, swollen or chemotic conjunctiva. In the latter cases they keep in position even more firmly, as the swollen conjunctiva around the cornea gives them a better support. They can be used several times, after re-shaping if necessary. When the cornea is damaged or covered by a conjunctival flap, the contact corneal rings can be used too, provided they are cut out according to the shape of the changed corneal margin (Fig. 3.)

FIG. 3.

Contact corneal ring designed for a case with a triangular conjunctival flap covering the cornea; 3 mm. high, 6 mm. at the base. Corneal diameter, 12 mm.

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