THE MICROSCOPE IN OCULAR SURGERY

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Today, many of the ordinary maneuvers in ocular surgery need the use of a magnifying lens. In some cases, a great magnifying power is required. The corneal microscope may be used for minute and delicate procedures, such as the extraction of corneal foreign bodies, sutures points, and so forth. However, the use of the corneal microscope and slitlamp is limited because with these instruments the patient must be in a sitting position which is satisfactory for examination but not for intraocular surgery.

The Littmann-Zeiss surgical microscope permits use of high-power magnification—with the patient in a horizontal position. It is particularly useful in extracting foreign bodies from the cornea and anterior chamber, for the rupture of the synechias, for the extraction of capsular debris, in dissecting the cornea in lamellar keratoplasty, in extraction of corneal and corneoscleral sutures, in estimating the depth of an incision, in determining the position of the hyaloid in aphakic eyes in which it is necessary to do a paracentesis of the anterior chamber, and so on.

Use of this instrument also permits visualization and elimination of those foreign bodies which constantly invade the operative field, such as cotton fibers and talcum powder—particles invisible to the naked eye that may enter the operative wound, and cause postoperative complications.

The surgical microscope, as it is constructed, presents no difficulty in exploratory procedures or for simple operations which can be done with one hand while the other hand adjusts the microscope to maintain correct focus and centering. However, in more complicated operations, difficulties arise: magnification is hard to adjust; there is false projection of the image; it is difficult to maintain the operative field in correct focus.

The difficulties arising from magnification or false projection are controlled with practice only. False projection is less of a problem when the objective is inclined so that the operative field seen through the microscope is the same as that observed on looking down without the microscope.

Displacement of the operative field can be avoided by good general akinesia; in special cases, the surgeon can make corrections by moving the patient’s head, or an assistant can adjust the microscope as the surgeon directs, or the operative field can be centered by means of the light source of the instrument.

Focus changes should be made by the surgeon. The problem of doing this while working with both hands has been solved by construction of a foot control which adjusts the focus instantly on pressure with the right
foot. By this pedal attachment it is possible to maintain the correct focus for each successive operative step. With this attachment, the observation field of the microscope does not change when it is in a vertical position but does change in an inclined position; however, displacement of the image in ocular surgery is not important, if one keeps in mind that focussing displacements almost never reach five mm.

The axial illumination which the microscope provides is excellent for eyes without photophobia or for well-anesthetized eyes; but for sensitive eyes, and especially for extraction of sutures, I have found a way to lower the intensity of the light.

Use of the slitlamp permits observation of the optical section. When the slit is completely open, lateral illumination, which has great advantage in some ocular interventions, is provided, for example, in anterior segment surgery, the visibility is better with lateral than with axial illumination.

The slitlamp (Zeiss standard model) has been firmly attached to the microscope by means of a special arm which permits adjustment in any position. To the optical system I have added a 10-diopter concave lens for focussing at a distance of 15 cm. The focus of the slitlamp and microscope can be adjusted to the same plane before the operation. During the operation, the lamp and microscope will focus on the same plane and this plane can be controlled with the pedal attachment.

Adapting the slitlamp to the surgical microscope gave excellent results in lamellar keratoplasties because it was possible to visualize the thickness of the receiving bed. It is also useful in extraction of foreign bodies situated in the deeper layers of the cornea and for biomicroscopic observation of the anterior segment, fundus, and anterior-chamber angle in anesthetized children.

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