

Gonioscopy: a Review

How, when, and why to perform this examination.

BY JOHN HETHERINGTON, JR, MD

A review of gonioscopy is warranted by the fact that the examination is underperformed, according to the current standards set forth by the AAO. The general infrequency with which clinicians perform gonioscopy, of course, has led to an overall decrease in their skill at diagnosing the various forms of glaucoma, particularly the classification of the narrow-angle form of this disease.

HISTORY

Alexios Trantas, Maximilian Salzmann, Manuel Uribe Troncoso, Leonhard Koeppe, and Otto Barkan—these are some of the physicians who developed gonioscopy as it is used today. Dr. Barkan was the first to demonstrate the gonioscopic differences between open-angle and narrow-angle glaucoma, a major milestone. William van Herick developed the technique of slit-lamp gonioscopy. Robert Shaffer, MD, created a classification system of the angle's width.

METHODS

Today, the most common approach to gonioscopy uses a Zeiss lens and a slit lamp (Figure 1). It requires some skill and a light touch on the cornea to avoid artificially opening the angle, which could lead to incorrect grading. Advantages of this technique include speed and an excellent view of the optic disc. In addition, the clinician may compress the central cornea and deepen the chamber in order perhaps to break an acute angle-closure attack, to break anterior synechiae, or to force a narrow angle to open enough to allow the identification of structures that assist with classification.

The Koeppe lens is an excellent teaching tool but is complicated to set up. It provides a panoramic view of the angle and allows great maneuverability to see into a narrow angle and identify the scleral spur or angle recess.

When elaborate diagnostic equipment is not available, a crude but simple way of grossly identifying a shallow anterior chamber with narrow angles is to hold a flashlight temporarily and parallel to the iris. Forward bowing of this tissue will cast a shadow on the nasal iris (Figure 2).

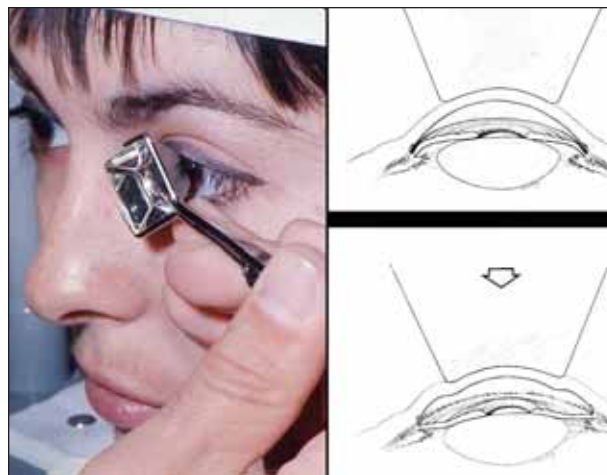


Figure 1. The most common form of gonioscopy today uses a Zeiss lens and a slit lamp (left). The drawings show the changes in which there is deepening of the anterior chamber and widening of the angle (right).



Figure 2. When diagnostic instruments are lacking, the clinician may hold a flashlight temporarily and parallel to the iris. A shadow on the nasal iris indicates forward bowing of the tissue.

WHEN TO PERFORM GONIOSCOPY

Gonioscopy is indicated in all patients with glaucoma and glaucoma suspects. The examination should also be performed on eyes with a narrow angle by the

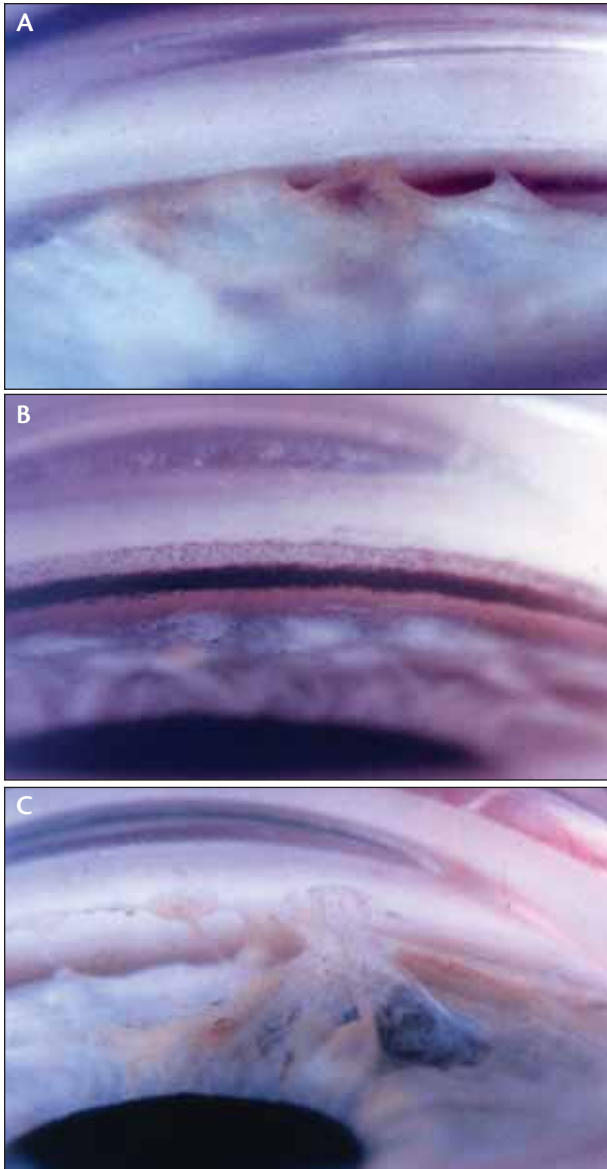


Figure 3. Gonioscopy demonstrates angle closure due to peripheral anterior synechiae that can be broad or tent-like. Note the wide-open angle between the adhesions (A). An eye with a Krukenberg's spindle has a grade 4 angle and a grade 4 pigmentary band as well as elevated IOP (B). Koeppe gonioscopy of a child with Axenfeld's anomaly shows marked posterior embryotoxin and an iris that is adherent to the cornea (C).

van Herick classification, a shallow anterior chamber, and symptoms of angle-closure glaucoma (Figure 3A). Additional signs meriting gonioscopy are exfoliation of the lens, Krukenberg's spindle (Figure 3B), and abnormalities of the iris. The examination is also indicated in patients with congenital glaucoma (Figure 3C), suspected neovascular glaucoma, inflammatory condi-

tions, a history of trauma, and a history of failed filtering surgery.

ALTERNATIVES

Devices for analyzing the anterior segment are evolving rapidly and will ultimately be more refined and less expensive. They include ultrasound biomicroscopy (eg, P40 Ultrasound BioMicroscope [Paradigm Medical Industries, Inc., Salt Lake City, UT] and VuMax Ultrasound Biomicroscope system [Sonomed, Inc., Lake Success, NY]), anterior segment optical coherence tomography (eg, Visante OCT [Carl Zeiss Meditec, Inc., Dublin, CA] and SL-OCT [Heidelberg Engineering GmbH, Heidelberg, Germany]), the scanning peripheral anterior chamber depth analyzer, the RetCam (Clarity Medical Systems, Inc., Pleasanton, CA), and Scheimpflug imaging (Pentacam Comprehensive Eye Scanner; Oculus, Inc., Lynnwood, WA) for three-dimensional analysis. The advantage of these instruments is that they can measure the anterior chamber depth and angle, iris, ciliary body, and scleral thickness, for example. These devices can enhance clinicians' understanding of the mechanics of angle closure (particularly with dark-room testing). The instruments can also facilitate the detection of ciliary block glaucoma, ciliary body detachment, and the causes of pigmentary dispersion due to posterior bowing of the iris.

CONCLUSION

Dr. Shaffer stated it best when he wrote, "Gonioscopy is indispensable in the diagnosis, treatment, and understanding of glaucoma."¹ Clinicians who do not regularly perform this examination may benefit from practicing on eyes with open anterior chamber angles in order to become familiar with the appearance of the angle structures. They will then be better able to recognize narrow and closed angles. An excellent resource for gonioscopic education is the Web site developed by Wallace L. M. Alward, MD, <http://gonioscopy.org> (see the article on page 32 for more information). □

John Hetherington, Jr, MD, is a clinical professor at the University of California, San Francisco. He acknowledged no financial interest in the products or companies mentioned herein. Dr. Hetherington may be reached at (415) 986-0835; admin@glaucomagroup.org.

1. Shaffer RN. *Stereoscopic Manual of Gonioscopy*. Saint Louis: The CV Mosby Company; 1962.

CONTACT US

Send us your thoughts via e-mail to
gtletters@bmctoday.com.