Schiötz tonometry

David Ponka MSc MD CM CCFP(EM) FCFP **Faisal Baddar** MD CM CCFP

Contraindications

Active corneal infection or disruption.

Applications

Diagnose glaucoma or determine those at risk of glaucoma based on elevated intraocular pressure (IOP).

Equipment necessary

- Schiötz tonometer kit (also includes plunger weights, test block, conversion tables, and pipe cleaner)
- Topical ophthalmic anesthetic

Set-up

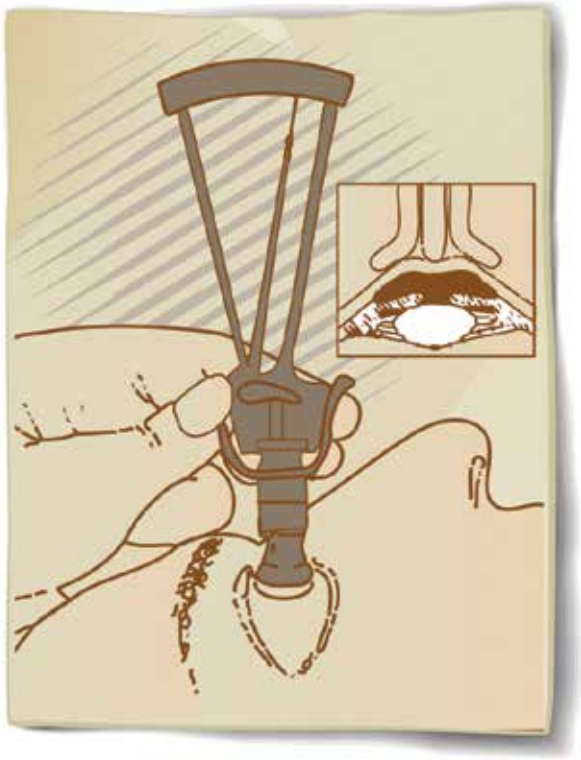
Complete a fundoscopic examination and determine visual acuity. (Visual acuity is the eye's vital sign—acute ophthalmic emergencies almost always affect it.) Apply 1 or 2 drops of anesthetic to the patient's eye. Prepare the tonometer using the 5.5-g weight and test to make sure it rests at zero when on the test block.

Procedure

1. With the patient supine, open the lid of the eye with one hand and hold the tonometer with the thumb and middle finger of the other hand. Ensure that the footplate of the tonometer is centred over the cornea, then carefully lower the tonometer until it is resting on the cornea. The tonometer should be perpendicular to the cornea in a vertical position. Avoid resting fingers on the eyeball, as this will falsely increase pressure.
2. Notice the scale reading. For results of less than 4, perform another reading to confirm elevated IOP (the lower the reading, the higher the IOP; IOP is calculated using the conversion tables included in the tonometer kit). With subsequent readings, add the 7.5-g or 10-g weight as needed to narrow the reading to between 4 and 8.
3. Using the conversion tables, calculate the scale reading in millimetres of mercury. If the reading is greater than 20 mm Hg, refer the patient to an ophthalmologist.
4. Advise the patient that it is very important not to rub or touch the eye after the procedure, as this can lead to corneal abrasion.
5. Carefully clean the tonometer according to the care instructions in the Schiötz tonometer kit.

Evidence

Studies[1-3] point to electronic applanation tonometers as being superior to the Schiötz tonometer in terms of accuracy (as compared to the Goldmann applanation tonometer, the criterion standard, which is part of the slit lamp apparatus). However, the Schiötz tonometer is cheaper, equally as safe, and more widely used. Residents should learn this technique, lest they be caught unaware in front of a patient with acute red eye in a remote community.



Diagnostic confirmation

Referral to an ophthalmologist for Goldmann applanation tonometry will confirm the diagnosis.

Dr Ponka is Associate Professor in the Department of Family Medicine at the University of Ottawa in Ontario. **Dr Baddar** is a family physician at Sulaiman Al-Habib Medical Center in Dubai, United Arab Emirates.

References

1. König HL. Tonometry in general practice—its use in early detection of primary open-angle glaucoma. *S Afr Med J* 1986;69(5):309-11.
2. Lasseck J, Jehle T, Feltgen N, Lagrèze WA. Comparison of intraocular tonometry using three different non-invasive tonometers in children. *Graefes Arch Clin Exp Ophthalmol* 2008;246(10):1463-6. Epub 2008 Jun 14.
3. Yamamoto LG, Young DA. Tonometry methods in the pediatric emergency department. *Pediatr Emerg Care* 2010;26(9):678-83.

The physical examination is facing extinction in modern medicine. **The Top Ten Forgotten Diagnostic Procedures** series was developed as a teaching tool for residents in family medicine to reaffirm the most important examination-based diagnostic procedures, once commonly used in everyday practice. For a complete pdf of the Top Ten Forgotten Diagnostic Procedures, go to **http://dl.dropbox.com/u/24988253/bookpreview%5B1%5D.pdf.**