Five rules to evaluate the optic disc and retinal nerve fiber layer for glaucoma

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A systematic approach for the examination of the optic disc and retinal nerve fiber layer is described that will aid in the detection of glaucoma. This approach encompasses 5 rules: evaluation of optic disc size, neuroretinal rim size and shape, retinal nerve fiber layer, presence of parapapillary atrophy, and presence of retinal or optic disc hemorrhages. A systematic process enhances the ability to detect glaucomatous damage as well as the detection of progression, and facilitates appropriate management.

Key Words: Glaucoma, optic nerve, optic disc, retinal nerve fiber layer, optic disc hemorrhages

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The evaluation of the optic nerve and retinal nerve fiber layer (RNFL) is essential to the recognition of glaucomatous damage. An optic nerve or RNFL abnormality is often, but not always, the first sign of glaucomatous damage.[1,2] In the earliest stages of the disease, optic nerve and RNFL damage may be present, while standard automated perimetry is still within normal limits.[3-6] Early glaucomatous damage can be difficult to detect, requiring careful observation of the optic nerve and RNFL. Optic disc photography or optic nerve and RNFL imaging should be performed at the initial visit and yearly thereafter to document the optic nerve and RNFL status. In situations in which stability is in question, photography and imaging may be done at earlier intervals.

Recent studies have found the difficulty clinicians have in following guidelines proposed by professional organizations.[7,8] These guidelines recommend documentation of the optic disc appearance at the time of diagnosis and at periodic intervals during followup. In one study utilizing a chart review, 193 primary open-angle glaucoma (POAG) patients were followed up in 8 private practices in the Los Angeles area for at least 2 years.[8] Almost all patients had a photograph or drawing at the initial examination, but, at the final followup visit, 33.2% had not had an optic nerve drawing or photograph taken within the previous 2 years. Another 37.8% had not had optic disc photography since the initial examination. A more recent chart review evaluated records from 395 POAG patients in 6 managed care plans.[7] Only 53% had optic disc photographs or drawings at the initial examination.

Although several textbooks and articles describe the characteristic signs of glaucomatous damage to the optic disc,

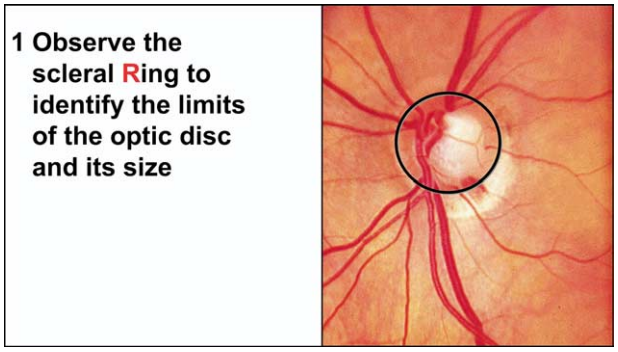

Figure 1 The first rule for the assessment of the optic disc is the observation of the scleral ring and assessment of optic disc size.

Figure 2 The shape of the optic disc is oval, usually slightly greater vertically than horizontally.

no systematic approach for optic disc examination in glaucoma has been widely disseminated.[9,10] When examining a patient who either has established glaucoma or is suspected of having the disease, a systematic approach to optic disc and RNFL examination is necessary so that glaucomatous optic neuropathy is not overlooked. A thorough optic nerve examination should be used along with perimetry to diagnose glaucoma and to assess disease severity. Staging the disease and consideration of risk factors for glaucoma progression enables the clinician to establish a target intraocular pressure. The structural assessment (optic nerve and RNFL) and functional evaluation (perimetry) are used together to monitor for change over time as well restage the patient's condition.[1]

Figure 3 The optic disc size varies among individuals, with cup size correlating with the size of the optic disc. These examples are from 4 individuals with different optic disc sizes. The largest is in the top left, followed by top right, lower left, and lower right. Note how the cup size correlates with the disc size, except for the picture in the lower left in which the person has glaucoma with a wedge RNFL defect and large cup.

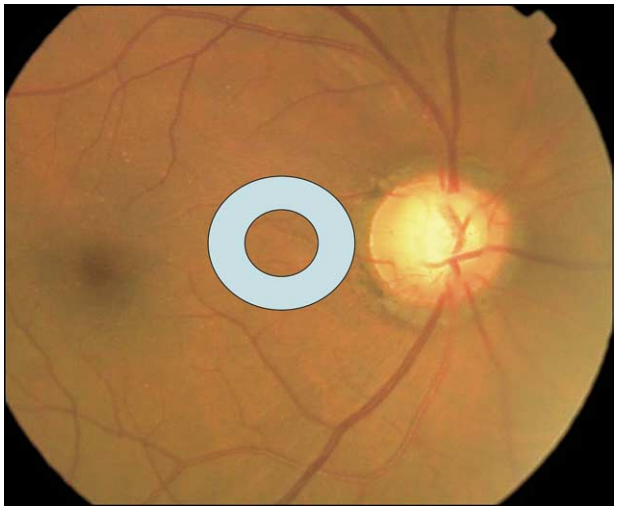

Figure 4 The optic disc size can be evaluated using the small spot of light from the direct ophthalmoscope. In this example of an average size disc, the spot approximates the size of the optic disc.

In this report, we describe a systematic approach for the evaluation of the optic disc and RNFL in glaucoma that can be incorporated easily into clinical practice. This approach was conceived originally by 3 of the authors and published as a PowerPoint monograph entitled FORGE (Focusing Ophthalmology on Reframing Glaucoma Evaluation) that was sponsored by Allergan, Inc.

Methodology

The five rules (5Rs) for the assessment of the optic disc in glaucoma include:

1. Observe the scleral Ring to identify the limits of the optic disc and evaluate its size.

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