Financial Disclosure: None reported.

Funding/Support: This study was supported by grants from Åke Wibergs stiftelse, the Swedish Medical Research Council, and Foundation Fighting Blindness and by grant EY13053 from the National Institutes of Health (Dr Adamus).

Additional Contributions: Susanne Boystrom provided skillful technical assistance.


Central Corneal Thickness and Optic Disc Hemorrhages: The Beijing Eye Study

Central corneal thickness (CCT) has been described to be a predictor for the development of primary open-angle glaucoma and the progression of glaucomatosus visual field defects in the Ocular Hypertension Treatment Study1 and other investigations.2,3 Correspondingly, a previous investigation by Herndon and colleagues found that CCT was the most consistent predictor of the degree of glaucomatosus damage in their hospital-based cross-sectional study. However, CCT also influences application tonometry, so it has remained unclear whether the reported findings are due to the dependence of intraocular pressure measurements on CCT and a corresponding selection artifact of patients or whether a thin cornea may predispose the eye to a higher glaucoma susceptibility. Since optic disc hemorrhages can indicate progression of glaucomatosus optic neuropathy and because most of the previous investigations were hospital-based studies with a possible referral bias, it was the purpose of our population-based study to assess whether CCT influences the development of disc hemorrhages.

Methods. The Beijing Eye Study is a population-based cohort study in northern China.4 The medical ethics committee of the Beijing Tongren Hospital approved the study protocol and all of the participants gave informed consent according to the Declaration of Helsinki. Of 5324 individuals aged 40 years or older residing in the study area, 4439 individuals (2505 women) participated in the eye examination (response rate, 83.4%) in the year 2001 as described in detail previously.4 In 2006, the same population was invited for a reexamination, with 3251 subjects participating (response rate, 73.3%). All of the participants underwent a standardized ophthalmic examination including CCT measurement by slitlamp optical coherence tomography. Only 1 randomly selected eye was taken for statistical analysis. Glaucoma was defined by the appearance of the optic nerve head as described recently.4,5

Results. Of the 3251 subjects, CCT measurements were available for 3100 subjects (95.4%); 32 of them (1.0%) showed an optic disc hemorrhage. The CCT was slightly greater in the hemorrhagic group (mean [SD] CCT, 569.5 [33.8] µm) than in the nonhemorrhagic group (mean [SD] CCT, 556.0 [33.0] µm) (P=.03; after application of the Bonferroni method to correct for performing multiple statistical analyses, P=.06) (Figure). Including glaucomatosus eyes (n=77) only, the CCT did not vary significantly between the hemorrhagic group (n=58 eyes [9%], mean [SD] CCT, 571.8 [36.1] µm) and the nonhemorrhagic group (n=72 eyes [9%], mean [SD] CCT, 549.3 [31.4] µm) (P=.24), with the hemorrhagic group having slightly thicker corneas than the nonhemorrhagic group.
Table. Criteria for the Definition of Glaucoma in the Beijing Eye Study

<table>
<thead>
<tr>
<th>Criteria Type</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Neuroretinal rim notch in the temporal inferior region and/or the temporal superior region, so that the ISNT rule was not fulfilled (in eyes with an optic cup sufficiently large to allow an assessment of the neuroretinal shape). Localized retinal nerve layer defect that could not be explained by any cause other than glaucoma. Abnormally large cup in relation to the size of the optic disc.</td>
</tr>
<tr>
<td>Relative</td>
<td>Neuroretinal rim was markedly thinner in the inferior disc region compared with the superior disc region, even if the smallest part of the neuroretinal rim was located in the temporal horizontal disc region. Diffuse decrease in the visibility of the retinal nerve fiber layer (particularly in eyes with small optic discs) if the background pigmentation of the eye allowed an assessment of the retinal nerve fiber layer and if there were no reasons other than glaucoma for retinal nerve fiber layer loss. Marked diffuse thinning and/or focal thinning of the retinal arteries if there were no reasons other than glaucoma for retinal vessel thinning. Optic disc hemorrhage if there were no other reasons for a disc bleeding such as retinal vessel occlusions.</td>
</tr>
</tbody>
</table>

Abbreviation: ISNT, inferior-superior-nasal-temporal.
<sup>a</sup>The only criterion for optic disc glaucoma was a glaucomatous appearance of the optic disc.
<sup>b</sup>If no absolute glaucoma criteria were positive, at least 2 relative criteria had to be positive including a suspicious neuroretinal rim shape in eyes with an optic cup large enough for the assessment of the rim shape, or at least 2 relative criteria had to be positive including the occurrence of an optic cup in a small optic disc that usually would not show cupping. The intraocular pressure and the occurrence of visual field defects were not criteria for the diagnosis of optic disc glaucoma.
<sup>c</sup>Each of which were sufficient.

Comment. The findings point against a thin cornea to be a pathogenic risk factor for glaucoma progression.

Liang Xu, MD
Haitao Zhang, MD
Ya Xing Wang, MD
Jost B. Jonas, MD

Correspondence: Dr Jonas, Universitats-Augenklinik, Theodor-Kutzer-Ufer 1-3, 68167 Mannheim, Germany (jost.jonas@augen.ma.uni-heidelberg.de).

Financial Disclosure: None reported.

Funding/Support: This work was supported by grant 7071003 from the Beijing Natural Science Foundation.


Primary Clear Cell Carcinoma of the Conjunctiva

Clear cell carcinoma is a rare variant of squamous cell carcinoma of the skin characterized by extensive cytoplasmic hydropic change. These tumors tend to occur in the head and neck of elderly white men. Because the clear appearance of the cytoplasm is due to hydropic change rather than the accumulation of lipid, mucin, or glycogen, histochemical stain results are negative. Some of these clear cells have a "bubbled" cytoplasm and have been confused with sebaceous carcinoma. To our knowledge, primary clear cell carcinoma on the conjunctiva has not been reported.

Report of a Case. A 79-year-old man visited for continuation of care after changing residency. His ocular history was significant for a conjunctival tumor excised from the right eye 12 years earlier. The patient brought his medical records with him. The original pathologic interpretation was Bowen disease. After the tumor was excised, local recurrences developed 1 and 4 years later. Both were removed surgically and diagnosed as carcinoma in situ. The patient had not had an eye examination in several years. On examination, corrected visual acuity was 20/150 OD. A papillomatous conjunctival tumor was at the limbus, extending from the 9-o'clock position to the 3-o'clock position (Figure 1). The anterior chamber was normal. Other than cataract, the remainder of the examination was non-contributory. There was no regional adenopathy. The tumor was excised under local anesthesia with a visibly normal margin, and abnormal epithelium was removed from the cornea mechanically. The surgical bed

Figure. Box plots showing the distribution of central corneal thickness in subjects with and without optic disc hemorrhages in the Beijing Eye Study. Open circles indicate outliers. The box contains 50% of the data; the line in the box represents the median.

Correspondence: Dr Jonas, Universitats-Augenklinik, Theodor-Kutzer-Ufer 1-3, 68167 Mannheim, Germany (jost.jonas@augen.ma.uni-heidelberg.de).

Financial Disclosure: None reported.

Funding/Support: This work was supported by grant 7071003 from the Beijing Natural Science Foundation.