cases of RPE carcinoma have been clinically misdiagnosed as choroidal melanoma. Currently, most subretinal tumors assumed to be choroidal melanomas are treated with radiotherapy without histological confirmation. The diagnosis of an RPE carcinoma may therefore be missed.

Finger et al. described a darkly pigmented subretinal tumor accompanied by inflammation that was suspected of being a choroidal carcinoma of the RPE. In several published cases, RPE carcinomas were darkly pigmented, but in others, including our case, they were clinically non-pigmented and did not exhibit significant uveitis. Tumors have been located at the posterior pole and as well anterior to the equator. Other clinical features appear to be more useful for the differential diagnosis, including a retinal blood supply of the tumor and extensive yellowish exudates. Both features are rare in choroidal melanoma.

The cellular pattern in this case was that of a highly differentiated adenoid tumor. Invasive growth was the criterion for malignancy. There was no evidence of extraocular spread or metastasis. In fact, metastasis has been absent in all well-documented cases. Extraocular extension has been described by Loeffler et al. This was the only case that showed no adenoid differentiation but randomly oriented spindle-shaped cells with several mitotic figures. This may represent a more aggressive and invasive form of RPE carcinoma.

Shields et al. found that neoplastic RPE proliferations usually develop in otherwise normal eyes. However, in a large proportion of the recently published cases, an RPE carcinoma arose from a juxtapapillary histoplasmosis scar, from a congenital hypertrophy of the RPE, or in an eye with phthisis. or in our case from a chorioretinal scar following a subfoveal neovascular membrane. Therefore, it appears likely that reactive proliferation of the RPE plays a role in the pathogenesis of these rare tumors.

Andres Sommacal, MD
St Gallen, Switzerland
R. Jean Campbell, MD
Rochester, Minn
Horst Hellbig, MD
Zürich, Switzerland

The authors have no relevant financial interest in this article.

Corresponding author: Andres Sommacal, MD, Institute of Pathology, Kantonsspital St Gallen, CH-9007 St Gallen, Switzerland (e-mail: a.sommacal@ksgg.ch).

fornix of the right eye. This man, a photographic laboratory technician, was involved in a road accident 50 years previously and received a wound to the lower eyelid and lacrimal canaliculus of the right eye. He subsequently experienced bothersome epiphora and had developed the habit of wiping his tears while working in the darkroom with the same piece of cloth that he used to wipe developer and fixer solutions from his hands.

At clinical examination, he had a corrected visual acuity of 20/20 in both eyes. The anterior and posterior segments of the left eye had a normal appearance. The right eye had a scar extending from the forehead to the medial canthus, which was slightly lower than the contralateral medial canthus. The edge of the lower eyelid and lacrimal canaliculus were interrupted by a scarred notch situated between the lacrimal punctum and medial canthus (Figure 1). The skin of the lower eyelid was covered with small spots, sometimes coalescent, of a metallic grayish-brown (Figure 2). The ocular and palpebral conjunctiva, particularly in the inferior part, and the lacrimal caruncle was a dark grayish-brown (Figure 1). At high-power slitlamp examination, the cornea had finely granular grayish-brown deposits with a metallic appearance in the Descemet membrane and particularly numerous deposits in the inferior hemicornea (Figure 3). A subepithelial ring containing brownish particles was observed in the limbus. Intraocular pressure was 8 mm Hg in both eyes, and ocular fundus examination did not reveal any abnormality. On the basis of the patient's clinical history and clinical examination results, the diagnosis of exogenous ocular argyrosis was proposed and subsequently confirmed by means of conjunctival biopsy.

Results of histological examination of the conjunctival epithelium were normal, but the superficial stroma contained numerous small blackish granules, sometimes situated immediately underneath the epithelium, but they did not induce any inflammatory reaction (Figure 4). Electron microscopy of the clumps of electron-dense deposits showed that they were both extracellular, associated with elastic fibers (Figure 5), and intracellular, situated inside intact cells (Figure 6), and that they sometimes clearly localized in secondary lysosomes (Figure 7). No specific treatment was proposed after confirmation of the definitive diagnosis.

Comment. Ocular argyrosis is a discoloration of the ocular tissues secondary to silver deposits. It can be either endogenous or exogenous, and its causes are mainly iatrogenic or occupational.

Exogenous ocular argyrosis used to be caused mainly by prolonged use of colloidal silver eye-drop preparations (Argyrol, Protargol) used as disinfectants.2-4 Because these eyedrops are no longer used, this cause of disease has become exceptional. Apart from a few rare cases of accidental burns of the cornea during silver nitrate cauteryization of the eyelid or limbic conjunctiva, argyrosis is now essentially an occupational disease caused by inadequate protection of the eyes in the
workplace. According to a review of the literature\(^3\) and various published case reports and series,\(^4,6-8\) subjects exposed to argyrosis are workers in the silverware industry—polishers, engravers, smelters, silver platers, silver workers—factory workers manipulating silver nitrate, photographic film and x-ray film manufacturing workers, and photographic laboratory technicians.

In most cases, contact with the eye is indirect and caused by rubbing the eyes and eyelids with fingers contaminated by silver particles, and it is in all published cases bilateral. Silver deposits are formed in the conjunctiva, mainly in the inferior fornix, close to the medial canthus, lacrimal caruncle, perilimbic

**Figure 3.** Corneal argyrosis with grayish-brown deposits in the Descemet membrane.

**Figure 4.** Histological examination of the conjunctiva shows subepithelial silver deposits (hematoxylin-eosin, original magnification ×64).

**Figure 5.** Electron microscopy of the conjunctiva shows compact clumps of silver deposits between elastic fibers (original magnification ×32000).
corneal epithelium, and Descemet membrane. The Bowman membrane is spared in exogenous argyrosis.

The case presented here is unusual because of the series of events leading to unilateral corneal-conjunctival argyrosis that mimicked conjunctival melanoma. This patient, with a history of unrepaired traumatic section of the inferior lacrimal canaliculus 50 years previously, had bothersome lacrimation. He constantly wiped his tears with the same piece of cloth that he used to wipe his hands and that was covered with photographic developer and fixer solutions. Fixer solutions contain suspensions of silver salts derived from unexposed parts of the film, and the concentration of these salts gradually increases if the solution is not regularly renewed. This patient therefore transferred silver particles to his eye, mainly during periods with a high silver concentration in the fixer solution, which gradually led to the appearance of marked ocular argyrosis.

The clinical and histological features of the ocular lesion in this case correspond to those of exogenous argyrosis. Light microscopy of the conjunctiva showed that the silver deposits were essentially subepithelial; electron microscopy showed that they were both extracellular and intracellular, as in previously reported cases. Slitlamp examination of the cornea demonstrated that the silver deposits involved the Descemet membrane, which had a grayish-brown granular appearance, while the Bowman membrane was spared.

Clinical confusion between localized conjunctival argyrosis and conjunctival melanoma has already been reported after use of silver sutures for strabismus surgery in childhood. However, to our knowledge, the case reported here is the first clinical and histological description of a case of exogenous unilateral occupational argyrosis mimicking a pigmented tumor of the conjunctiva. The unusual sequence of events leading to this case of argyrosis emphasizes the importance of meticulously obtaining clinical history, which may sometimes be sufficient to establish the diagnosis.

Leonidas Zografos, MD
Sylvie Uffer, MD
Line Chamot, MD
Lausanne, Switzerland

The authors have no relevant financial interest in this article.

Corresponding author and reprints: Leonidas Zografos, MD, Hôpital Ophtalmique Jules Gonin, 15, avenue de France, Case postale 411, 1000 Lausanne 9, Switzerland (e-mail: leonidas.zografos@ophtal.vd.ch).

A morgagnian cataract is a hypermature cataract in which the total liquefaction of the cortex has allowed the nucleus to sink inferi- orly. 2 Herein, we report a rare case of morgagnian cataract with an isolated posterior opening with no history of trauma and its successful management. To our knowledge, this is the first documented case in Japan.

Report of a Case. A 64-year-old man experienced worsening vision for 2 years. His best-corrected visual acuity was worse than 20/30 OU since he was 20 years old, and he has not been permitted to have a driver’s license.

On the initial examination, his best-corrected visual acuity was 20/300 OD and 20/60 OS. Slitlamp biomicroscopy revealed a solid nucleus that descended to the lower equatorial region and a round, isolated posterior capsular opening that was seen through the hydrated cortex in his right eye (Figure 1A). There was no iridodonesis, and the intraocular pressure was normal. His left eye had a cataractous lens with opac- ity of the posterior pole (Figure 1B).

The patient was diagnosed as having morgagnian cataract, and he underwent cataract surgery by phacoemulsification and foldable intraocular lens implantation through the small incisions. Limited anterior vitrectomy was performed to manage vitreous loss through the posterior capsular opening. The intraocular lens was implanted safely into the capsular bag without marked enlargement of the posterior capsular rupture (Figure 1C). His corrected visual acuity after surgery improved to 20/30 OD. In the right ocular fundus, crystallike foamy substances were observed on the surface of the macular region (Figure 1D).

The patient’s father (Figure 2, I-2) and eldest daughter (Figure 2, III-2) underwent cataract surgery when they were 20 and 30 years old, respectively. In one of the patient’s