profile of the inner retinal cleavages (Figure 2). The mean ± SD thickness of the retina at the site of the cleavages was 106.4 ± 17.7 μm and that of the adjacent unaffected retina was 254.2 ± 25.8 μm. The mean thickness of the retina at the site of the cleavages was significantly thinner than that of the adjacent unaffected retina (P < .001, Mann-Whitney U test). The fluorescein angiograms showed no abnormalities. The results of standard automated perimetry (Humphrey Field Analyzer 30-2 program; Carl Zeiss Meditec, Dublin, Calif) were normal, but microperimetry with a scanning laser ophthalmoscope (Scotometry program, version 3.0; Rodenstock Instruments, Ottobrunn, Germany) revealed a relative scotoma in the area of the retinal cleavages (Figure 3).1 No retinal cleavage was found in her parents or her elder brother.

Comments. Chihara and Chihara2 reported a cleavage of the retinal nerve fiber layer in eyes with high myopia, but there has been only 1 report of retinal cleavages around blood vessels in highly myopic eyes. They used the term “cleavage” to distinguish the cleavages from the “defect” seen in glaucomatous eyes.

It is clinically important to differentiate the cleavage from the retinal nerve fiber layer (RNFL) defect. The cleavage is often spindle shaped and we never see small bundles of nerve fiber passing across the RNFL defect. However, there should be many cases in which we cannot make a clear distinction between them just by fundoscopic appearance. Optical coherence tomographic imaging should be very useful in such cases in making a correct diagnosis.

The optical coherence tomographic images showed the cleavages clearly along with the possibility that these cleavages extended deeper than the nerve fiber layer. Although Chihara and Chihara2 reported that the retinal sensitivity in the area of the cleavage was not depressed, we detected a relative scotoma in that area in our case. These findings indicated there may be some abnormalities in nerve conduction in the area of the cleavage.

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Double Optic Discs, Optic Disc Coloboma, and Pit: Spectrum of Hybrid Disc Anomalies in a Single Eye

Doubling of the optic disc is rare and is seen as true doubling or pseudodoubling. We describe a peculiar case with multiple anomalies involving a single optic disc: a coloboma involving the optic nerve along with a pit and sensory detachment, and pseudodoubling of the optic disc with a disclike lesion within the coloboma.

Report of a Case. A 34-year-old man was referred to our institute as a case of a “peculiar optic disc.” Examination revealed a right eye that was within normal limits and a left eye that had a coloboma involving the optic disc. A small, craterlike depression was seen in the center of the coloboma. A thin blood vessel along with a tuft of whitish glial tissue extended down from the optic disc and entered the crater on its superior aspect. Several thin vessels emerged from the lesion, thereby simulating another optic disc (Figure A and B).

Since we found it difficult to photograph the entire optic disc and coloboma without loss of detail of the simulated optic disc with a standard fundus camera (VISUPAC FF 450Plus IR; Carl Zeiss Meditec, Jena, Germany) (Figure, A), another fundus photograph using a digital slitlamp camera (VISUPAC Digital Archiving system; Carl Zeiss Meditec) and a

Figure 2. Optical coherence tomographic image of the right eye corresponding to the scan line indicated by the arrow. Some of the outer retinal layers other than the nerve fiber layer appear to be absent in the areas of the cleavages.

Figure 3. Microperimetry of the right eye with a scanning laser ophthalmoscope. (Size, Goldmann I; brightness, −15 dB; background, 10 candelas/m²). The patient did not recognize the stimulus at the positions indicated by the red Ps.
Mainster ultrawide field lens (Western Ophthalmics, Lynnwood, Wash) placed over the patient’s cornea was taken with satisfactory results (Figure, B). The inferotemporal portion of the coloboma lodged an optic pit. Sensory detachment was confined to the temporal part of the coloboma. Peripapillary pigmentary changes surrounded the temporal aspect of the disc and the coloboma. The macula was normal. Optical coherence tomography disclosed a craterlike depression corresponding to the simulated optic disc, which is also less clear than in earlier fundus photograph. Inset, optic pit (arrow) in inferotemporal aspect of coloboma, which is clearer than in earlier fundus photograph. C, Optical coherence tomographic picture of patient’s left eye (oblique line scan through disclike lesion and temporal aspect of coloboma), showing coloboma and craterlike depression (arrow) corresponding to disclike lesion. Gial tissue surrounding vessel entering lesion superiorly (arrowhead) and sensory detachment in temporal aspect of coloboma (asterisk) are obvious. D, Optical coherence tomographic picture of patient’s left eye (horizontal line scan through temporal aspect of coloboma and adjacent temporal peripapillary retina), showing sensory detachment in temporal aspect of coloboma (asterisk). Arrow denotes confinement of sensory detachment to temporal margin of coloboma, with sparing of adjacent peripapillary retina.

Comment. A diagnosis of true doubling is made with direct or indirect evidence of twin optic nerves. Our patient had only a single optic nerve as imaged by B-scan ultrasonography, though magnetic resonance imaging would have been more informative. Pseudodoubling of the optic disc is also rare and is commonly caused by optic disc colobomas or peripapillary colobomas. Our patient had the interesting finding of an optic disc–like lesion within a coloboma. Additional abnormalities such as an optic pit, serous detachment confined to the coloboma, peripapillary altered pigmentation, and a glial tuft were observed. The latter 2 abnormalities are usually seen in association with the morning glory syndrome that occurs owing to embryologic insults to the distal optic stalk. The coloboma involves an injury to the proximal embryonic fissure. The origin of the pit is debated, with some speculating it to be owing to an improper closure of the superior end of the embryonic fissure. Our patient had a spectrum of hybrid disc anomalies, suggesting an instance of early embryonic injury involving both the proximal embryonic fissure and the distal optic stalk. To our knowledge, there is no other such case described in the literature.

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Orbital Emphysema Leading to Blindness Following Routine Functional Endoscopic Sinus Surgery

Functional endoscopic sinus surgery (FESS) is a procedure commonly performed for sinus pathologic examination. It is a minimally invasive technique that aims to restore drainage and aeration of the sinuses.

Orbital emphysema is a reported complication of FESS and is often considered to be self-limiting and is not sight-threatening. We report the case of a patient who suffered irreversible visual loss following FESS. To our knowledge orbital emphysema causing complete and irreversible loss of vision has not previously been reported as a complication of FESS.

**Report of a Case.** A 60-year-old man had routine uncomplicated FESS for recurrent sinusitis and nasal congestion. He had bilateral uncinectomies, middle meatal antrostomies, and anterior ethmoidectomy on the left. He was discharged the following day on oral antibiotics. He returned 48 hours later complaining of moderate periorbital swelling around the left eye after sneezing. Visual acuity was 6/6 in both eyes, extraocular movements were full and there was no relative afferent pupillary defect. He was advised to avoid blowing his nose. Six hours later he returned with increased periorbital swelling, pain, and blurring of vision in the left eye. He had severe swelling of the left eyelids and a tense orbit. Movement of the left eye was severely limited and vision had fallen to counting fingers with a mild relative afferent pupillary defect. Fundoscopy showed slightly engorged retinal veins with a patent central retinal artery and no disc swelling. A computed tomographic scan of the orbits revealed orbital emphysema in the left orbit superiory (Figure). He was admitted to the hospital for close monitoring. The following morning, visual acuity was no perception of light in the left eye with a dense relative afferent pupillary defect. Fundal appearance was unchanged but the orbit was less tense. He was taken to the operating theater immediately for lateral canthotomy and orbital exploration. Blunt dissection of orbital tissues allowed air to escape. Intravenous acetazolamide was given at the time of surgery. Visual acuity was no perception of light on the first postoperative day. There has been no further visual improvement in 6 months.

**Comment.** Orbital emphysema occurs when there is direct communication between the orbit and 1 of the nasal sinuses and air is forced into the orbit under pressure, usually after nose blowing, sneezing, or a Valsalva maneuver. If the air cannot escape from the orbit because of a ball-valve mechanism, an acute compartment syndrome develops that may cause a compressive or ischemic optic neuropathy leading to blindness. Reported cases cite central retinal artery occlusion, optic nerve ischemia, or direct optic nerve compression as the cause of transient visual loss. Orbital emphysema usually resorbs spontaneously without permanent visual damage. However, if the vision deteriorates, rapid action must be taken in order to prevent irreversible damage. This case illustrates that delaying surgical intervention can result in blindness, and we would advocate immediate surgery to decompress the orbit and allow air to escape. An urgent orbital computed tomographic scan should be requested to localize the air. Surgical options include lateral canthotomy, cantholysis, and direct aspiration of the air. Additionally, intravenous steroids to reduce intraorbital inflammation and acetazolamide or mannitol to reduce intraorbital pressure could be used, however, there are no randomized controlled trials investigating the efficacy of these treatments in this condition.

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