3 patients with cystoid macular edema (CME) as a long-term complication of hydrogel explants.

A 65-year-old woman presented with decreased visual acuity (VA) in the left eye for 9 months. Six years earlier, a retinal detachment (RD) of this eye was treated successfully with a radial hydrogel explant. Examination revealed metamorphopsia and a decrease in VA from 20/32 to 20/100. A swollen hydrogel explant with intact overlying conjunctiva was observed in the temporal superior quadrant. The retina was attached, and there was no flare or cellular infiltration of the vitreous and anterior chamber (AC). Cystoid macular edema was observed biomicroscopically and on fluorescein angiography. Treatment with topical prednisolone acetate 1% and ketorolac 0.5% had no effect. Three months after initial presentation, the explant was removed. No scleral thinning or inflammation was observed at the site of the explant. Shortly after removal of the explant, the metamorphopsia disappeared and the CME was no longer discernable. Visual acuity improved to 20/63.

A 75-year-old man presented with metamorphopsia and decrease in VA to 20/63 in the left eye. His VA had been 20/25 after successful treatment for an RD with a hydrogel explant 9 years earlier. Ophthalmologic examination revealed a swollen explant, with a partially eroded conjunctiva. Mild vitritis was present, and CME was observed on biomicroscopy and fluorescein angiography (Fig 1A [available at http://aaojournal.org]). The retina was attached and the AC clear. After prophylactic laser treatment of the peripheral retina over 360°, we removed the explant. Three months later, the metamorphopsia had disappeared, and VA increased to 20/25. Biomicroscopy and fluorescein angiography demonstrated resolution of the vitritis and CME (Fig 1B [available at http://aaojournal.org]).

A 63-year-old man developed RD after cataract extraction with vitreous loss. It was treated successfully with scleral buckling surgery using a hydrogel explant. Six years later, he presented with granulomatous uveitis in this eye. He complained of metamorphopsia, and VA had decreased from 20/20 to 20/40. The hydrogel explant was swollen. Mutton fat precipitates were observed, and cells and flare were present in the AC and vitreous. Fluorescein angiography demonstrated CME. Although the uveitis responded reasonably well to topical steroid treatment, the CME and uveitis recurred 3 times a year over the next 7 years. Finally, we decided to remove the grossly swollen explant extending over 180°. Topical steroids were discontinued, and VA increased to 20/25.

Intraocular inflammation and CME have been described in silicone explants, but only related to infection and extrusion of the explant in the presence of marked scleral thinning.[3] In our 3 cases, there were no signs of extraocular infection or scleral thinning, and in 2 patients, the overlying conjunctiva was intact.

In a histopathological study, a granulomatous reaction was noticed on the inside of the capsule surrounding hydrogel explants.[4] It was specifically present in regions where the hydrogel was fragmented and anchored to the inner capsule. This feature is unique to the hydrogel material, and it was theorized that these fragments might give rise to a foreign-body giant cell reaction. The specific granulomatous reaction in the capsule could be an explanation for the CME and intraocular inflammation, because granulomatous inflammation of the sclera is known to be associated with intraocular inflammation as well.[5]

In conclusion, hydrogel explants should be considered as a cause of CME with or without chronic intraocular inflammation in patients with previous RD surgery. Removal of the hydrogel explant material may result in resolution of the CME and, thus, in preservation of the visual function.

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Choroidal Melanoma Prognosis

Dear Editor:

We read with great interest Kaiserman et al's article on artificial neural networks to forecast the 5-year mortality of choroidal melanoma patients on the basis of demographic, clinical, and ultrasonographic data.[1]

In clinical medicine, investigators have at times used mathematical models to assist with decision making for risk forecasting, diagnostic classification, and prognostic stratification of patients. We must ask whether the selected models have adequate predictabilities to be of use in our daily practice. Generally, it is best to evaluate *discrimination* and *calibration* concurrently.[2] Discrimination is a measure of how well a model separates subjects correctly into different groups. On the other hand, calibration is utilized as goodness of fit to assess the degree of correspondence between the estimated probabilities produced by a model and the actual observations.

There are several common approaches to assess the discrimination for predictive classification, including sensitivity, specificity, positive and negative predictive values, likelihood ratios for positive and negative tests, and the area under the receiver operating characteristic curve. To compare the classification performance of artificial neural networks with that of logistic regression models, one investigation found that only 25% of articles provided calibration information to quantify their models.[3] When comparing models, it may be dangerous to define a better model using only discrimination, because poor calibration can occur in a highly discriminating model when classifier outputs are transformed monotonically. After reviewing Kaiserman et al's findings,[1] readers cannot recognize which model is truly superior. To avoid this pitfall, misclassification rate, Pearson χ^2, or Hosmer–Lemeshow statistics could be used to assess calibration.[4]

To select a better classification model in clinical research, it is essential to assess the model's strength based on discrimination and calibration.

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Author reply

Dear Editor:

We thank Drs Chiu, Hu, Li, and Hsu for their remarks regarding our article. Our study focused on the ability of artificial neural networks (ANNs) to discriminate which patients will die from metastatic choroidal melanoma within 5 years from brachytherapy. We agree that both discrimination and calibration are important in evaluating such mathematical models. Discrimination is a measure of how well the ANN separates the patients into those who will develop metastases from uveal melanoma and those who will not; calibration determines how similar the ANN's probability estimate is to the true probability. However, in a clinical setting the true underlying probability of developing metastases is unknown and can be estimated only retrospectively from the actual outcome. To test the calibration of the best ANN presented in our article (one hidden layer of 16 neurons), we looked at the 5-year mortality in the test group (76 patients) subdivided into mortality probability subgroups as estimated by this ANN (Table 1 [available at http://aaojournal.org]). As can be seen, there is a good correlation between the mortality probability estimate of the neural network and the actual mortality. When the network estimated a probability of $<$30%, actual mortality was 8.7%, whereas for those patients who had a probability estimated to be high ($>$60%), observed mortality was 53% ($P = 0.0007$, χ^2 test).

All this being said, in our opinion it is still the network's ability to discriminate between patients who will die and those who will live that is most important for clinical daily use. This is why clinical ANNs are tested primarily by their discrimination ability and only a quarter of articles on clinical implementations of ANNs also provide calibration information.[1]

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Lacrimal Fossa Anatomy

Dear Editor:

In the June 2005 issue, Fayet et al[1] reported on the surgical anatomy of the lacrimal fossa. They are to be congratulated on their computed tomodensitometry analysis of 59 patients before endonasal dacryocystorhinostomy (DCR).

The data on the size of the lacrimal sac and its extension above the head of the axilla of the middle turbinate are useful and correlate well with previous computed tomography studies of this area.[2] The study[1] has several interesting findings:

1. "The OMT [operculum of the middle turbinate] was always anterior to the junction between the maxillary bone and the lacrimal bone."
2. The uncinate process (UP) "was more frequently posterior (32.5%) or adjacent (45.5%) to the LF [lacrimal fossa] at the lower level . . . and adjacent to the middle turbinate at the upper level."
3. "The almost constant overlapping of the UP onto the LF at the level of the common canaliculus indicates that the most effective approach for successful DCR [dacryocystorhinostomy] osteotomy is via a submucosal cleavage and resection of the anterior part of the UP."

The authors have previously reported their endonasal DCR technique, which involves initial uncinectomy.[3,4] I agree that the surgical anatomy of the sac is of vital importance when contemplating endonasal DCR, as the landmarks are not as well understood as those in external DCR. In 2003, we described a technique involving the creation of lacrimal sac flaps, anterior and posterior, as well as the creation of a posteriorly hinged nasal mucosal flap.[5,6] We also stressed the importance of the starting maneuver in endonasal DCR. This is based on the identification of the frontal process of the maxilla and its articulation with the lacrimal bone. The indentation of the frontal process of the maxilla on the lateral nasal wall is a constant anatomical landmark, and we have not found the need for any adjunctive measures when locating the lacrimal sac. The current study supports the anatomic constancy of this landmark. I agree the fundus of the sac needs to be completely exposed, and this is in most cases not possible with a punch. I have employed a powered drill to remove the bone above the attachment of the middle turbinate.