OBSERVATIONS ON COGAN'S MICROCYSTIC DYSTROPHY OF THE CORNEAL EPITHELIUM

BY *DuPont Guerry, III,* M.D.*

ABOUT A DECADE AGO, during a routine office examination, a peculiar type of corneal epithelial dystrophy first came to my attention. The case was that of a seventy-year-old widowed white female, Mrs. E. W., whose complaint was of gradual visual failure due to progressive cataracts. Each cornea, when studied by diffuse oblique illumination with the corneal microscope, exhibited a bizarre picture. Over the entire corneal surface many irregular, faintly gray configurations varying in size from a millimeter or so to several millimeters and with a clear zone between patches were seen. The borders of these maplike areas appeared a darker gray than did the hinterland. In addition to these large irregular splotchy areas, several small irregular, putty gray dots were found clustered about the upper portion of the cornea 3 mm. within the limbus in the right eye and immediately below the apex in the left eye. These were of irregular shape and size, were discrete, and did not coalesce. When the slit-lamp beam was narrowed down the large geographical configurations were almost impossible to see, but the small grayish discrete dots were readily visible and could be brought into sharp focus. They were found to be in the superficial epithelium. None of the lesions stained with fluorescein or with Bengal rose. It could not be determined whether or not there was any loss of visual acuity because of the corneal changes since the patient had advanced cataracts in both eyes, but it was felt that in view of the general clarity of the cornea there was probably little or no loss of visual acuity except from the cataracts. I was unable to classify these corneal changes and, therefore, gave them the descriptive term of "maplike epithelial dystrophy of the cornea." Since I had never seen such corneal changes before and since I was unable to prognosticate what effect a cataract extraction might have on the future course of

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the maplike dystrophy, the patient was advised to undergo cataract extraction, but with a guarded prognosis. An uneventful intracapsular extraction was carried out October 2, 1956. Postoperative vision was 20/20 with correction. Following surgery there was no change in the appearance of the dystrophy save for the fact that the peculiar, putty-gray, discrete epithelial opacities disappeared from their original locale, only to relocate at another sector of the cornea, and the map-like changes constantly changed their location, contour, and size.

I have followed this particular individual for almost nine years and there has been essentially no change in the general appearance of the maplike dystrophy in so far as the over-all pattern goes, but the

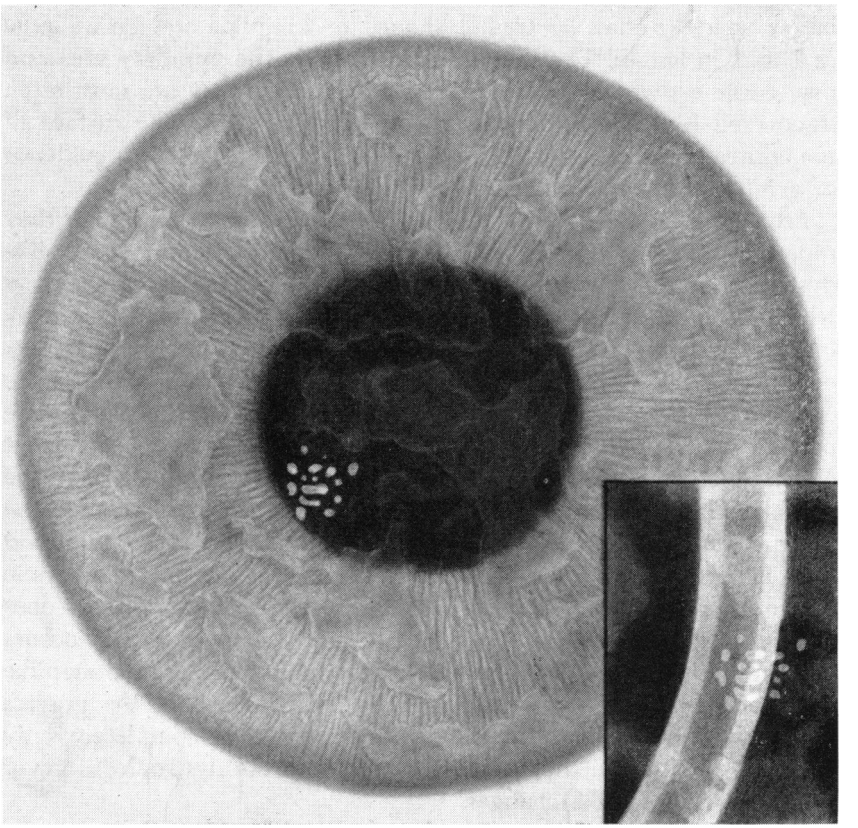

FIGURE 1. ARTIST'S DRAWING OF LEFT CORNEA CASE 1.

In oblique illumination the maplike changes are prominent and the dots (cysts) are also readily discernible. In slit-beam, maplike changes are difficult to see, while dots are sharply delineated. Both lesions are seen to be in the epithelial layers.

irregular geographical configurations, as well as the peculiar dots, have been in a constant state of flux, none of the dots or the geographical configurations remaining long in one position. The patient's general health has remained good and she has refused surgery on the fellow eye, stating that she is completely happy with the good vision in the operated eye.

At a meeting of this Society last year Cogan, Donaldson, Kuwabara, and Marshall[1] presented a paper documenting five cases of keratopathy which they called microcystic dystrophy of the corneal epithelium. In their cases "clinically the lesions appear as grayish-white, discrete but sometimes confluent, spheres measuring usually 0.1–0.5 mm. in diameter and situated in the superficial portion of the cornea. The larger opacities may be comma-shaped or irregular and be as large as 1 mm. in length. They are most common in the pupillary area and may cause a slight reduction in visual acuity but they are most often discovered fortuitously during a routine examination. The surface of the cornea is usually smooth; rarely does the condition show evidence of exfoliation or give rise to a foreign body sensation."

After hearing this presentation, I felt that these cases which they reported probably represented the same type of dystrophy as maplike dystrophy and shortly thereafter I set about reviewing all of my cases which fit in this category and which now number nine. In every instance but one the same irregular, small, grayish, putty-like dots described by these authors were present, but in addition the entire epithelial surface was also involved in the larger over-all maplike pattern which had seemed to me to represent the more prominent clinical picture of this dystrophy. And, indeed, in one case where the maplike changes were present no dots were found although the patient was examined at three- to four-month intervals for a period of a little over two years. I believe, therefore, that the microcystic dystrophy of the corneal epithelium described by these authors does not occur clinically as simple, discrete, putty gray dots, but occurs only in association with the maplike dystrophic changes; the maplike dystrophic changes may occur without the presence of the grayish dots, however. Furthermore, the dots may disappear completely, only to reappear later, but the cornea affected with the dystrophy is never free from the maplike changes.

I am in complete agreement with Cogan and his co-workers that the condition represents a benign dystrophy although in several of our cases the patient has complained of mild discomfort. In one case the symptoms were controlled by the occasional use of a local steroid

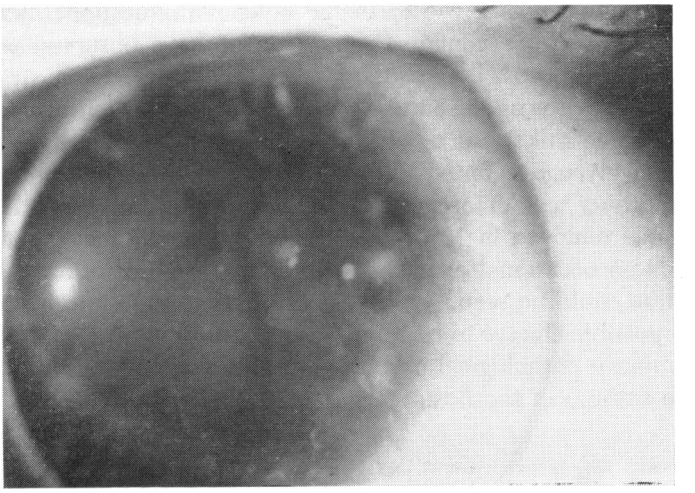

FIGURE 2. CASE 3, O.S.
Photograph showing maplike lesions and dots. The maplike lesions are very difficult to photograph.

preparation. In several of the cases also there was a diminution in visual acuity and in the only case where the epithelium was curretted, Case 7, the patient's visual acuity improved from a poor 20/40 to 20/25 and in the regenerated epithelium there was no evidence of dots, but an occasional irregular geographic pattern could be seen. Following currettage, the dots disappeared in the fellow eye, but two months later three extremely small but typical dot-type lesions were to be seen at the apex.

In Case 7 where currettage was carried out for visual purposes it was found that the epithelium appeared to be much more loosely applied to Bowman's membrane than is usually the case (also observed by Cogan and his co-workers), the epithelium being easily dislodged in one large sheet. This epithelial sheet was divided into two portions, one for electron microscopic studies, and the other for studies with routine stains. These will be reported fully in another paper.

Cogan and his co-authors have made interesting observations on the pathology of this dystrophy. The chief pathology which they found may be summarized as follows: (1) discrete intra-epithelial cysts containing pyknotic nuclei and cytoplasmic debris; (2) anomalous basement membrane within the epithelial layer. Undoubtedly the cysts noted pathologically are responsible for the putty gray dots seen clinically in the epithelium and it is my opinion that the anomalous

basement membrane in the epithelial layer is unquestionably responsible for the maplike configurations which I have observed with the corneal microscope. These authors were unable to demonstrate any increase in the glycogen content of the epithelium which distinguishes pathologically this type of dystrophy from Meesmann's dystrophy where the glycogen content is found to be abnormally high. Case 5 of the authors was of extraordinary interest in that the patient had had an eye removed in 1933 and when the microscopic sections were restudied an occasional extension of the basement membrane into the epithelium could be seen. It was felt that this probably represents the earliest possible change to be found in microcystic epithelial dystrophy.

Preliminary pathological studies carried out in our laboratory confirm the findings of the Boston group (Figures 3–5).

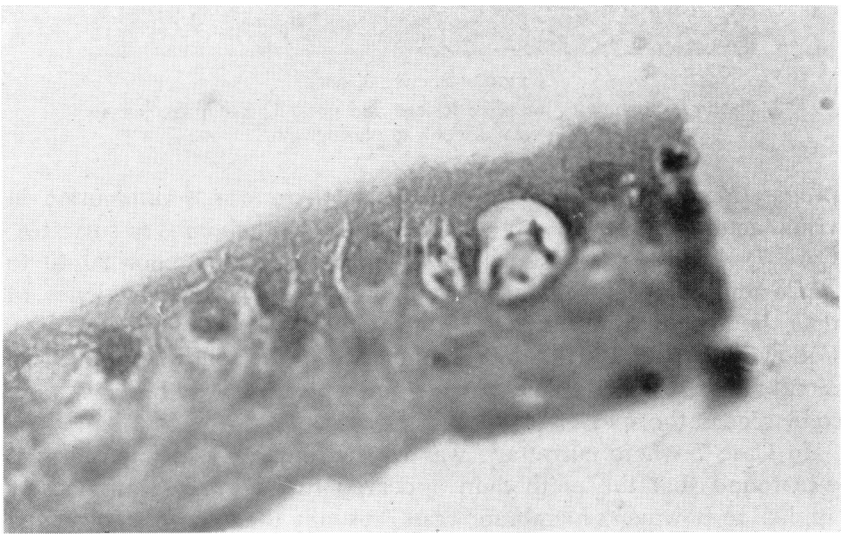

FIGURE 3. EPITHELIAL MICROCYST CONTAINING CELLULAR DEBRIS AND PYKNOTIC NUCLEI.

The incidence of this condition is open to question. Cogan and his co-workers have stated that the condition is apparently not rare since they were able to report five cases without searching their files too diligently. In my series of cases the nine cases here reported were found in about fifty thousand office records, but there was no particular effort made to ascertain that all cases had been ferreted out. It is also likely that cases could have been missed in the decade prior to recognition of our first case. It is also probable that cases could have been

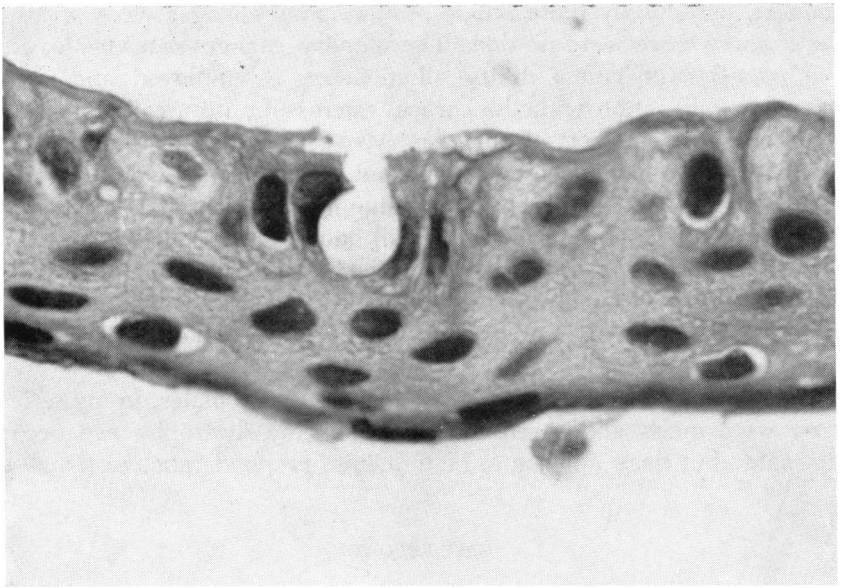

FIGURE 4. RUPTURED EPITHELIAL MICROCYST.
Contents have been extruded.

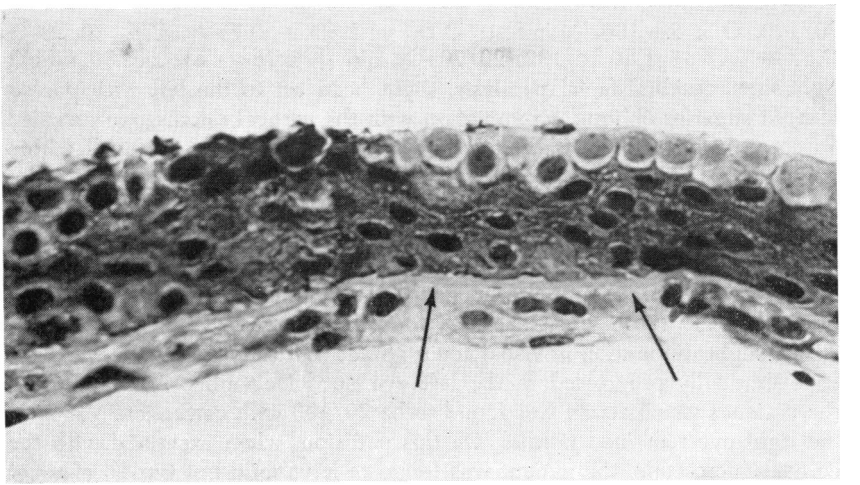

FIGURE 5. ANOMALOUS BASEMENT MEMBRANE DIVIDES EPITHELIAL LAYER INTO TWO STRATA.

missed, particularly those where only maplike changes were present and where there were no dots. The maplike changes can very easily be passed over unless diffuse illumination is employed and in a routine examination with the corneal microscope diffuse illumination may not be used. Most of our cases have been found in the past few years since we have been on the lookout for them. This would favor a much higher incidence than that of nine in fifty thousand.

The age of onset is not yet clear. In one of our cases (Case 3) the condition was apparently present at the age of forty, but most have been in their 'fifties or 'sixties at the time their dystrophy was discovered. The five cases of Cogan, *et al.* were essentially in the same age group.

All the cases of Cogan and his co-worker were females. In my series two were males and seven females. Thus the dystrophy can occur in males, but there appears to be a definite preponderance of females.

CASE REPORTS

CASE 2

J.B., a married white female, aged 54, was first seen in our office on May 8, 1944. She complained of blurred vision for distance and felt that a change in her glasses was indicated. In the past she had occasionally noted diplopia and when examined elsewhere by another ophthalmologist was found to have a vertical muscle imbalance.

On examination the following positive findings were noted. Vision O.S. 20/100, O.S. 20/100. Manifest: O.D. + 2.50 + 0.75 × 175, 20/20–2; O.S. + 0.75 + 1.50 × 102, 20/20–2, add + 2.75 — Metric .50. Slight right-sided residual facial paralysis, slight head tilt to the left with paresis of right superior oblique. Examination with the corneal microscope revealed no corneal or lenticular pathology and the fundus picture was well within normal limits. The patient was given her manifest acceptance with 2½ prism diopters base down in the right eye and 2½ prism diopters base up in the left eye.

Since that time the patient has been followed at two- to three-year intervals with no change in her general ophthalmological picture until December 21, 1959, when she was found to have early nuclear sclerosis with a slight diminution in visual acuity. Since that time cataractous changes have gradually progressed in the left eye until December 7, 1964, when the patient's visual acuity was found to be 20/100 with correction. Vision in the right eye remained normal. On this occasion, when examined with the corneal microscope, the patient was found to have mild but typical changes of maplike dystrophy, but no dots were to be seen. On February 8, 1965, the patient was re-examined and her corneal situation was found to be

essentially the same, there being a definite maplike epithelial dystrophy present, but no dots.

CASE 3

N.A.B., a 49-year-old married white female, was first seen in our office on June 9, 1961. The patient stated that for eight or nine years she had been treated by Dr. Kenneth Swan with cortisone drops for a "corneal condition." She had continued to use the steroid drops and found that when she left them off her eyes became somewhat irritated.

On examination the following positive findings were noted. Manifest O.D. $-$ 1.50 $+$ 2.50 $\times$ 90, 20/40; O.S. $-$ 2.00 $-$ 2.50 $\times$ 110, 20/30. Corneal microscope: Below the apex of each cornea there were several small, rounded, irregular, drop-like grayish epithelial deposits. The entire surface of each cornea was involved in a maplike epithelial dystrophy. The patient's glasses were changed and she was told to try going without steroids on occasion in order to determine whether or not they were necessary for comfort. She was seen four months later and had found that she could dispense with her drops. The patient has been seen at six- to eight-month intervals since then and when last examined in February, 1965, her visual acuity was found to be 20/25 in each eye and her corneal epithelial dystrophic changes were essentially unchanged. Her maplike configurations, however, had shifted position as had the location of her dots. She was entirely comfortable and had not used any steroid preparation for well over six months. She was given a change of glasses and reassured. I believe that this case is the one that Dr. Swan mentioned in his discussion of Cogan and his co-workers' paper.

CASE 4

A.E.Y., a 50-year-old white married female, was seen on June 22, 1961, in our office with the complaint of slightly blurred vision in the right eye of about one month's duration. Her glasses had been changed four years before and she felt that a change in her prescription was indicated.

Examination revealed the following positive findings. Manifest: O.D. $-$ 0.75 $-$ 0.75 $\times$ 82, 20/25 $+$ 2; O.S. $+$ 0.25 $-$ 0.75 $\times$ 80, 20/20, add $+$ 1.75 $-$ Metric .50. Corneal microscope: Several small irregular, grayish dots were found in the superficial apical epithelium of the right eye. Similar dots were seen at the apex of the left cornea also, but they were not as large or as numerous. Striking maplike changes were also present. No other pathology was noted. The patient has been followed at about six-month intervals since that time and there has been essentially no change in the refractive error or in the appearance of the dystrophic changes except that the epithelial dots are constantly changing position and the maplike configurations are in a constant state of flux. The patient has been tried on local steroids, but these have not changed the clinical picture either subjectively or objectively.

CASE 5

J.L., a 59-year-old married white female, was first seen in our office on October 5, 1961. She had been seen one month before by an optometrist who had told her that she had cataracts.

On examination the following positive findings were noted. Manifest: O.D. − 8.00 − 1.00 × 120, 20/25 − 2; O.S. − 8.50 − 1.50 × 43, 20/40 + 2, add + 3.00 − Metric 1.00. Corneal microscope: Moderately advanced nuclear and cupuliform cataract, O.D. greater than O.S. No corneal changes other than a very early cornea guttata were noted at this time. The patient's vision failed fairly rapidly and on April 2, 1963, an intracapsular extraction with peripheral iridectomy was carried out uneventfully in the left eye. Alpha-chymotrypsin was used during the extraction. On July 16, 1963, an intracapsular extraction with peripheral iridectomy was carried out in the fellow eye uneventfully and chymotrypsin was employed. The patient's postoperative course was uneventful, but three weeks postoperatively the patient was found to have some oily looking droplets deposited in the cornea of the right eye in the apical area and when examined with diffuse oblique illumination she was found to have a definite, but mild maplike dystrophy. Apparently postoperatively material from the oily base of the atropine and Neosone ointment had become deposited in the dystrophic epithelium where it imparted a greasy, oily, droplet appearance to the affected area. At this time several small typical putty gray lesions, characteristic of microcystic epithelial dystrophy, were also apparent; two small lesions and mild but typical maplike dystrophic changes were also present by now in the fellow eye.

Since that time the patient has been followed at intervals and when last examined on March 22, 1965, was found to have fairly marked maplike dystrophy with dots and epithelium containing oily material as previously noted. The lesions containing oily material have apparently not changed location, but the putty-like dots have and the maplike changes have also shifted location and contour. The patient's visual acuity has remained good and there have been no subjective symptoms.

CASE 6

C.W.M., a 53-year-old white male, was first seen in our office February 12, 1962. The patient complained of blurred vision in the right eye of four months' duration. Examination revealed the following positive findings. Advanced cupuliform cataract O.D., early cupuliform cataract O.S. Manifest: O.D. + 0.75, 20/40 + 2; O.S. + 0.25 + 0.75 × 75, 20/25, + 2.00 − Metric .50. Slight maplike dystrophy with a few grayish epithelial dots O.U. The vision failed rapidly in the right eye and an intracapsular extraction with peripheral iridectomy, employing chymotrypsin, was carried out uneventfully on April 3, 1962. The patient obtained 20/20 vision with a + 12.50 lens following surgery and was fitted with a contact lens. On August 20, 1962, the patient abraded the cornea of the left eye while

attempting to remove his contact lens. The patient has been followed since that time and has had only moderate success wearing his lens. It can be worn comfortably for short periods, but causes irritation with staining after three or four hours of wear. When last seen on June 15, 1964, the patient was still having difficulty with his contact lens and had almost ceased wearing it. The appearance of the mild dystrophic changes was essentially the same.

CASE 7

L.W.J., a 64-year-old married white female, was first seen in our office on January 20, 1964. The patient complained of moderate blurring of vision. Examination revealed the following positive findings. Manifest: O.D. + 0.25 + 0.62 × 69, 20/40; O.S. + 1.00 + 0.25 × 180, 20/30, add + 2.50 — Metric .50. Early nuclear sclerosis, slight cornea guttata. Slit-lamp examination revealed, in addition to the guttata, several grayish dots in the right cornea just inside the limbus in the 9 o'clock meridian and several dots of similar character at the apex of the left cornea. Fairly marked maplike dystrophic changes were also apparent. The patient was of extremely nervous temperament and complained constantly of her poor acuity which she felt was becoming progressively worse. On March 4, 1965, the visual acuity was 20/60 in the right eye and 20/40 in the left. Corneal currettage was suggested since it was felt that no other pathology could account for her poor vision and this was carried out on March 9, 1965. The cornea was curretted under local Dorsacaine anesthesia. The epithelium separated very easily from Bowman's membrane and came away almost intact in a large sheet. The curretted material was sent to pathology for complete study. Two weeks following currettage the visual acuity in the right eye had improved to 20/25 — 2 and there was no evidence of dots, but a faint, maplike configuration could be seen over the nasal portion of the cornea. Strangely enough, the grayish dots noted in the fellow eye also disappeared following currettage of the right eye, although currettage had not been carried out in this eye. There was very little change in the maplike configuration, however, although there was some shifting of the maplike changes and vision remained unchanged at the 20/40 level. Two months later several small dots had returned in the eye which had not been curretted.

This experience of the dots disappearing in the fellow eye was also noted by Cogan in a case where currettage was carried out on only one eye.

CASE 8

J.E.Z., a 63-year-old married white male, was first seen in our office on March 2, 1964. The patient stated that he had been told that he had a cataract in the right eye two years before and that his vision in his left eye had always been poor. In the past month or so his vision had failed considerably and he felt that he probably should have surgery carried out. On examination the following positive findings were noted. Manifest: O.D.

+ 2.00 + 3.00 × 173, 20/100 − 1; O.S. + 2.50 × 2, 20/60. Advanced nuclear and cupuliform cataract O.D. Incipient cupuliform cataract with moderate nuclear changes O.S. With oblique illumination very mild maplike dystrophic changes were apparent in each cornea, but there were no dots present. On June 23, 1964, an uneventful intracapsular extraction with peripheral iridectomy was carried out in the right eye with chymotrypsin. Following surgery just below the apex of the cornea a small irregular, grayish dot appeared with some oily globules incorporated in the central portion. A month later several other dots, typical of microcystic epithelial degeneration, were apparent in the apical area. The patient's visual acuity postoperatively was O.D. + 12.25 + 1.50 × 14, 20/20, add + 3.00 — metric .50. Since visual acuity had fallen to 20/200, an intracapsular extraction with peripheral iridectomy was carried out in the left eye on December 1, 1964. Chymotrypsin was employed. Following surgery in the left eye the visual acuity was as follows: + 10.75 + 2.25 × 175, 20/60. This has not improved and is apparently due to an old amblyopia ex anopsia as there is no other definite cause for the low visual acuity. In this eye typical dots and maplike dystrophy of a mild degree have been apparent, but there has been no inclusion of lipoid material in the epithelium. The patient was tried on a corneal contact lens, but diffuse epithelial staining appeared within twenty to thirty minutes, followed by considerable discomfort. No further effort was made to fit a contact lens of this type.

CASE 9

W.J.S., a married white female, was first seen in our office December 4, 1964. This patient had been seen by another ophthalmologist and referred to us for consultation because of a peculiar type of corneal change which he had noted. The patient's visual acuity had been considerably impaired and no cause other than the corneal changes was found to account for the diminution in visual acuity. When examined the following positive findings were noted. Manifest: O.D. — 0.62, 20/60; O.S. — 0.75, 20/50, add + 2.00 — Metric 1.00. Corneal microscope: marked maplike dystrophy with dots. The patient was tried on Predneferin, but this was not efficacious in improving the visual acuity. Contact lenses were fitted on January 15 and although the patient could wear the lenses comfortably, her visual acuity was not improved. Corneal currettage has been suggested, but the patient so far has refused this.

DISCUSSION

Cogan and his collaborators are unquestionably right in stating that this type of epithelial dystrophy had not been reported prior to their original paper. These authors made a careful search of the literature and I have done likewise and am unable to find any mention of epithelial pathology which in any wise simulates this condition.

I do not believe that this condition can be confused with any type of corneal pathology other than corneal scarring from either trauma or from chemical burns. Microcystic epithelial dystrophy is easily distinguished from these because the lesions in various scars of the cornea remain constant in location in those cases, whereas those of microcystic dystrophy never remain long in the same situation. Cogan and coauthors have suggested Meesmann's dystrophy as a differential diagnosis. In Meesmann's dystrophy the lesions appear as vacuoles and pathologically contain large amounts of glycogen. In microcystic epithelial dystrophy the grayish, dot-like lesions do not appear to be vacuolated and the maplike lesions certainly show no evidence of vacuolization. Pathologically there is no evidence of glycogen.

Symptomatology in microcystic epithelial dystrophy is minimal. In most instances the patient makes no complaint and if there is any complaint, it is that of slight irritation or slight blurring of vision. Irritation can usually be alleviated with a local steroid drop applied judiciously and blurred vision in most instances is of no great consequence. In one of our cases blurred vision was the chief complaint and following currettage vision was improved from a poor 20/40 to an adequate 20/25. In this particular case, however, the patient was a highly neurotic, middle-aged, married female and it is difficult to be certain that the rather marked improvement of vision was real and not imagined. Prior to currettage, while the patient had definite dots and maplike changes, it was felt that her visual acuity should have been considerably better than the admitted 20/40 and that some cause for the poor acuity other than the microcystic dystrophy should be sought. When nothing else was found currettage was carried out. The patient, after epithelial regeneration had taken place, exclaimed on the brightness and sharpness of her vision and could readily read the 20/25 line. The vision in the fellow eye, which had not been curretted and where only an occasional dot was present along with moderate maplike changes, remained at the 20/40 level and currettage has not yet been carried out. It will be interesting to learn what transpires following currettage in the fellow eye.

Cataract extraction can be carried out in microcystic dystrophy of the epithelium with impunity. Cataract extraction was carried out in one eye of two patients and both eyes of two patients without any untoward results. Good visual acuity was obtained following extraction in these eyes with one exception and in this instance the patient had had a moderate amblyopia ex anopsia prior to surgery. The best acuity obtainable in this eye was 20/60. It is interesting to note that in both

eyes of one patient and one eye of another, where atropine and neosone ointment had been employed postoperatively, globules of ointment base could be seen incorporated in the cystic areas of the corneal epithelium. These have caused no diminution in visual acuity and no irritation and have remained fairly constant in location and appearance.

Contact lenses of the corneal type were tried in two cases following cataract extraction. In both instances considerable irritation followed the wearing of the contact lens and in one case within twenty to thirty minutes following application of the lens the cornea stained almost completely with fluorescein. Microcystic epithelial dystrophy of the cornea therefore seems to preclude the use of this type of lens. A scleral type of lens has not been tried, but presumably this would be well tolerated since it would not be in close contact with the diseased corneal epithelium.

Thorough work-ups with laboratory studies were carried out in the three cases which underwent cataract surgery. Nothing of importance from a general standpoint was found.

I am unable to say whether or not there is any evidence of an hereditary pattern in this dystrophy since I have been unable thus far to program any genealogical studies. Such studies are planned for the future.

REFERENCES

1. Cogan, David G., David D. Donaldson, Toichiro Kuwabara, and Don Marshall, Microsystic dystrophy of the corneal epithelium, Tr. Am. Ophth. Soc., 62:213–25, 1964.

DISCUSSION

DR. FREDERICK W. STOCKER. We seem to be devoting most of the time this morning to corneal diseases the identity of which we do not know. Nevertheless, before we can go further into the etiology and the treatment of a disease, we have to describe a comprehensive picture of it.

In this respect, Dr. Guerry's contribution is very valuable. Dr. Guerry's contribution is important mainly for two reasons. First, he confirmed the findings reported by Dr. Cogan at last year's meeting of this Society which I had confirmed at that time myself. Second, he added another variation to the picture of this puzzling condition which he calls maplike epithelial dystrophy. The appearance of sheetlike opacifications beneath the epithelial surface of the cornea may be associated with, or follow the dot- or club-shaped opacities originally reported by Dr. Cogan. I can confirm the second observation also.

The following slides may illustrate these statements. (Slide) The first slide shows the picture of a patient's right eye, taken in 1950 when peculiar

subepithelial lesions were found in the pupillary area of the cornea, termed unclassified. In 1959 similar lesions were found in both eyes and in 1963 little change was observed.

The second case is represented in the following three slides. (Slide) The first slide shows the right eye in 1956 with the notation on the record, "grayish dots in center of cornea on Bowman's membrane." (Slide) The next slide shows the left eye at the same time without any lesion. One year later the left eye began to show similar spots as seen in the next slide. (Slide) During the following four years the lesions in the right eye became less noticeable, whereas they increased in the left eye. When seen last in 1961 the lesions in the right eye had almost completely disappeared; those in the left eye were still present.

The most interesting case is the following one. In this patient small club-like opacities were found on Bowman's membrane in the pupillary area of the right eye in 1958. In 1959 these lesions were less marked but the appearance of a veil-like haze over large areas of Bowman's membrane was noted in both eyes. In 1960 these deposits were barely visible any more. In October, 1964, the right eye again showed round and club-like opacities. (Slide) In April, 1965, these had again disappeared but a thin sheet on Bowman's membrane was noted instead. (Slide) A similar sheet was also present in the left cornea. (Slide) This patient had elevated blood cholesterol levels at times; the others did not.

It appears that the pathology we are dealing with here is not too uncommon. Its significance so far is quite obscure. The condition certainly is separate from the hereditary epithelial dystrophy described by Dr. L. B. Holt and myself, although there are also changes in the basement membrane of the epithelium observed there. (Slide) (*A.M.A. Arch. Ophth.*, 53:536–41, 1955.)

Possibly similar lesions have been accidentally observed in histologic specimens for many years as shown in this drawing by E. von Hippel (*Handbuch der Speciellen Pathologischen Anatomie und Histologie, Auge*, p. 322, Berlin, Julius Springer, 1928).

Because of the variable appearance of the lesion in the course of the disease the term microcystic should be dropped because it describes only one type of appearance. I propose that the condition, for want of any etoilogic explanation, be called Dystrophia epithelialis multiformis fugax (Cogan-Guerry) describing its location, its variability in the appearance, and its fleeting nature.

DR. DAVID G. COGAN. Dr. Guerry has been very sociable in attaching my name to these dots. After seeing his pictures and reading his paper, I think there is no doubt that these dots that he described are the same as those we described last year, and the pathology fortifies that.

We did not see, or at least we did not appreciate, what he calls a hinterland, map-like, opacification of the surface of the cornea that goes with the

dots, and which he showed very strikingly. It is very appealing for me to accept this as part of the dystrophy, because pathologically there is insinuation of the basement membrane within the layers of the epithelium, separating the layers of the epithelium. This extension of the basement membrane is not pathognomonic of this entity. We find it in a variety of conditions but in this condition it is appealing to think that it is the basis for that hinterland opacification that goes with the dots.

Why we did not appreciate in our cases what Dr. Guerry saw it so strikingly in his is difficult to say. It may be that we overlooked it, or it may be just that down here in Virginia, in the hinterland, they have things which we do not have in Boston.

Dr. Guerry. I would like to thank Dr. Stocker and Dr. Cogan for their very kind remarks and I want to assure Dr. Cogan that we are not going to start any new civil war about this thing!