METASTATIC TUMORS OF THE POSTERIOR OCULAR SEGMENT

BY *G. Victor Simpson*, M.D.

A METASTASIS TO THE POSTERIOR OCULAR SEGMENT from carcinoma is rare. So infrequently is it seen that it may not occupy enough of our attention. Proper diagnosis will be delayed by mistaking the intraocular reaction for an inflammatory lesion with which it may be confused. Furthermore, the most modern treatment of metastatic cancer will not be given our patients if we do not keep abreast of the advances in this field of medicine. It is the purpose of this paper to be a reminder that carcinoma does metastasize to the eye, to review its features and clinical course, to outline but not evaluate all the methods of treatment, and to report two cases of probable carcinoma metastasis to the choroid. This subject has been presented to the American Ophthalmological Society since 1933 in papers by Lemoine and McLeod,[1] Cohen,[2] Ellett,[3] and Cordes.[4] The latter contribution in 1944 is most informative and should be read carefully for history and background of metastatic intraocular tumors.

The posterior ocular segment is comprised of the optic nerve, sclera, choroid, and retina. Metastasis to the optic nerve has been reported by Elschnig,[5] Behr,[6] McDannald and Payne,[7] and Terry.[8] Reese[9] has seen one case of metastasis to the sclera. Metastasis to the retina is exceedingly rare and no cases have been reported since the one in 1934 by Smoleroff and Agatson.[10]

Metastasis to the choroid is many times more common than to other parts of the eye. When tumor cell emboli enter the ophthalmic artery, which in itself is a rarity, they have a much better chance of passing into the several short posterior ciliary arteries than into any other of the branches. The choroid will therefore be the most frequent location of metastatic eye tumors. The posterior pole of the eye adjacent to the macula is the most common area into which tumor cells become implanted. The left eye is more often involved

TR. AM. OPHTH. SOC., vol. 59, 1961

than the right, although in both of the cases to be reported in this paper the metastasis occurred into the right eye. Bilateral ocular metastases occur in 25 percent of the cases but not necessarily at the same time. If a choroidal metastasis is present, the brain may also be involved. It is probable that multiple foci to the eye and brain occur in the terminal stages of metastatic cancer.

LOCATION OF PRIMARY SITES

In spite of the fact that carcinoma of the breast accounts for only 15 percent of the general incidence of cancer, the breast is the site of the primary in 60 to 70 percent of metastatic eye tumors. To explain this it has been suggested that tumors of the breast, and possibly also of the lung, have a greater tendency to release showers of emboli into the blood stream than do tumors of the stomach and uterus, for example. Reese[9] states that breast cancer cells have a natural ruggedness that encourages survival under conditions that would be unsatisfactory to other tumor cells. Lemoine and McLeod[1] expressed a belief in an actual affinity of breast tumor cells for the choroid. It is more probable that cancer emboli from the breast simply find the uveal tissue a satisfactory environment. Once lodged in the uvea their normal vigor enables them to survive until they can gain a good foothold in the new implanted area.

Next in frequency to the breast as a primary site from which metastases may arise are tumors of the lungs and bronchi. Individual cases have been reported where the primary tumor was in the stomach, intestinal tract, prostate, testicle, ovary, thyroid, adrenal, kidney, mouth, and parotid gland. The finding of carcinoma emboli in the capillaries of various organs confirms the view that this type of cancer spreads by the blood stream. This means that the emboli must pass through the lungs before spreading out into the general arterial system, as a result pulmonary metastases are found in a high percentage of metastatic cancer cases. In the study reported by Lemoine and McLeod[1] 83 percent of their cases with choroidal lesions showed pulmonary metastases when subjected to complete autopsy.

The length of time between the primary cancer and a metastasis to the choroid varies a great deal. Cordes[4] mentions cases where the interval was a matter of weeks to a single case where the metastasis was delayed fourteen years. Reese[9] reports four cases where the metastasis occurred before the primary site was recognized.

CLINICAL COURSE

A disturbance of vision is the presenting symptom in almost every case of choroidal metastasis. Whereas a malignant melanoma grows slowly and may be discovered at routine examination, a metastatic tumor will have a more acute onset. Because the preferred location is near the macula the central vision will always be upset. Examination will reveal single or multiple lesions which can be seen through a retina which is becoming more or less hazy because of edema and not as yet because of invasion by the tumor. The lesion will be yellowish, yellow pink, or gray. It will give the appearance of being solid and slightly elevated within the retina. It will have an irregular outline and there may be a hemorrhage or two in the nearby retina. The extent of the surrounding edema will be much greater than the actual focus and will spread out in all directions from the focus. The central vision will be reduced and distorted. A central visual field study will reveal an absolute scotoma corresponding in size and shape to the edematous retina.

At this stage then there is very little that distinguishes this lesion from a focus of chorioretinitis or possibly a vascular occlusive phenomenon. The possibility that the lesion, which in some respects is different from both a chorioretinitis or a vascular phenomenon, could be a metastasis to the choroid must be kept in mind. Reese[9] cogently writes that patients do not as a rule volunteer information regarding operations for cancer which they have undergone in the past. This is particularly true of women who have had a breast removed because of cancer. If the patient is seriously ill with metastatic cancer the nature of the eye trouble will be readily appreciated. If, however, the ocular metastasis is an isolated event then the proper diagnosis will be established by examination and inquiry into the patient's medical history. It is at this stage of the metastatic eye disease, especially in patients at least obviously free from other metastasis, that the correct diagnosis is so important. Proper local and general treatment at this time may greatly affect the course of the disease.

As the tumor grows the reaction into and under the adjacent retina increases. The retina becomes more edematous in the immediate vicinity of the lesion and tends to obscure the tumor deposit. Fluid also begins to form under the retina and separates the retina from the tumor. At this stage or a little later it may be impossible to see the tumor and the patient may be thought to have a conventional serous detachment of the retina. Transillumination is of no value in making

a diagnosis. When once established the metastatic choroidal tumor grows in all directions and tends to remain relatively flat. The detachment of the retina, however, will be much more extensive than the tumor and the diagnosis will be difficult to make from the clinical appearance.

There will be an occasional exception to the clinical course that follows metastasis to the choroid from carcinoma of the breast. The exception is when the tumor arises away from the posterior pole of the eye and rather than maintaining a flat broad base that would bring an early subjective visual disturbance, the tumor grows in an elevated, localized fashion, not unlike a primary tumor. It is probable that cancer emboli other than from breast cancer may give rise to such metastatic growths. The case reported by Reese[9] (page 500) was a metastasis from a carcinoma of the thyroid gland. The second case reported in this paper was an elevated compact tumor, arising probably from a carcinoma of the parotid gland. The initial symptom was a disturbance of vision brought about by a hemorrhage into the vitreous.

As the choroidal metastasis continues to grow the retina becomes more and more detached until all vision is lost. Cordes[4] states that pain is more troublesome than with primary tumors even before glaucoma has occurred. Pain, however, was not a feature in either of the cases reported in this paper. Glaucoma is late in appearing in the clinical course of metastatic tumors but that is also true of primary tumors.

DIFFERENTIAL DIAGNOSIS

Metastatic tumors of the choroid must be distinguished from (1) primary tumors of the choroid, namely malignant melanoma and hemangioma, (2) acute chorioretinitis, (3) disciform degeneration of the retina, (4) a retinal vascular occlusive phenomenon characterized by an acute disturbance of central and paracentral vision with edema of the retina.

TREATMENT

Newer methods of treatment for metastatic cancer, especially from primary breast cancer, have increased the survival time to such a degree that the control of ocular metastases should no longer be considered palliative. Treatment must be so planned, as to result in the preservation of the greatest possible amount of the patient's vision for an indeterminate period of time.

The over-all management of the patient with metastatic cancer and choroidal deposits should not be in the hands of the ophthalmologist, but it is the ophthalmologist's duty to be familiar with every advance in the care of these patients. There is hope, as well as clinical evidence, that irradiation, chemotherapy, hormonal treatment, and more recently surgical procedures which have been found to bring about startling regression of widespread bony and soft tissue metastasis, may also benefit metastatic disease of the eye. Though we may not want to employ these procedures for ocular metastases to the exclusion of faster acting local irradiation, diathermy, or photocoagulation it is important that we be familiar with the methods that are available for the control of metastatic cancer.

The present day treatment therefore for metastatic carcinoma of the choroid by the ophthalmologist must include local treatment to ocular metastasis and a knowledge of the curative or palliative agents recommended for disseminated metastasis.

LOCAL TREATMENT

Cordes[4] reviewed the literature up to 1944 of patients who received local irradiation by X-ray, radon seeds, radium needles and packs. He concluded that the resu'ts from radium and X-ray were identical but for a number of reasons X-ray was the treatment of choice.[11,12] Reese[13] believes that X-ray therapy is the indicated type of irradiation and recommends the same technique as employed in the radiation of retinoblastoma. Hofman[13] treated four patients with choroidal metastases by radium contact using a 2.5 mg. needle. A single dose of 2,000–4,000 r led in all patients to regression of tumor tissue and good vision. The author believes that radium has the advantage over X-rays in that the amount of radiation can be delivered more exactly and can be limited to a small area.

In two papers Newell[14,15] and his associates have reported on the irradiation of the posterior eye by means of radioactive substances. In an experimental study yttrium pellets were attached to the sclera. The destructive action of this beta ray particle upon normal eye tissue will make further study necessary before its adoption. In the second paper a carcinoma of the choroid from a primary breast cancer was successfully treated with radioactive iodine. As reported by the authors the selection of the isotope I^{131} seems appropriate because it has suitable gamma radiation, it is readily available, and because the radioactivity can be concentrated into a small volume of the isotope. The

envelope technique as developed by Harper and used by the authors seems to have great advantages over the use of conventional X-ray. Not only is the technique simple but there is an adequate concentration of radiation at the site of the tumor with minimum chances of intraocular complications.

The successful treatment of retinoblastomas by diathermy coagulation has been reported by Weve,[16] Perera,[16] and Dunphy.[17] No report of its use in choroidal carcinoma was found in the literature but it deserves consideration if radiation is not available. None of the three recent papers on light coagulation therapy[18,19,20] has mentioned the use of this type of energy for choroidal carcinoma. It too would seem to deserve consideration.

In summary then so far as the local treatment of carcinoma of the choroid is concerned some form of radiation still remains the best. The only innovation that would seem to simplify the technique and provide greater safety is the use of radio isotopes. There may however be some secondary tumors in the choroid that are not radio sensitive and their destruction by diathermy or light coagulation might be accomplished.

GENERAL TREATMENT

The general control procedures for metastatic carcinoma, especially metastatic breast tumor, are (1) irradiation, especially successful in bone metastasis, (2) chemotherapy alone or combined with irradiation, (3) hormone therapy, (4) bilateral adrenalectomy and oophorectomy, (5) hypophysectomy.

CHEMOTHERAPY

At the present time the chief chemotherapeutic agent for metastatic cancer is triethylenethiophosphoramide or thiotepa.[21] This drug is an alkylating agent with similar action to nitrogen mustard but lacking the disagreeable and toxic side effects of the latter. To be sure the drug reaches the tumor it may be given orally, intravenously, directly into the tumor, or directly into the abdominal or pleural cavity. The drug is palliative and not curative, and treatment must be maintained indefinitely. Where prolonged palliation of metastatic cancer is indicated the phosphoramide drugs are useful. There have been no reports on the influence of this drug upon choroidal metastases.

HORMONE THERAPY

General surgeons have known for a long time that the administration of hormones has an accelerating or a depressing influence upon the

activity of certain tumors. The concept applies to tumors which arise from tissues that are not self-sufficient but in part dependent upon hormone for growth and function. The breast in the female and the prostate in the male are examples of such tissues.

It was found that the use of androgens in breast carcinoma and estrogens in prostatic cancer could temporarily control the tumors which arose from these hormone dependent tissues. However, not in all cases was the reaction within the tumor a favorable one and contradictory results followed the general use of these substances. At the present time if hormones were to be used either in conjunction with or to the exclusion of other anticarcinogenic agents testosterone would be the accepted hormone for secondaries from primary breast cancer. If the result was not favorable stilbesterol could be substituted. There are reports in the literature of the regression of unilateral and bilateral choroidal metastasis under hormone treatment. The case reported by Cogan and Kuwabara[22] concerns a patient who developed metastatic cancer five years after a radical mastectomy. A remarkable regression of choroidal and pulmonary lesions accompanied large doses of diethylstilbesterol. Testosterone had previously failed to influence the course of the metastatic lesions.

Nathanson[23] reported on a clinical investigation into the relative value of estrogens and androgens in a large series and his conclusions would leave one in great doubt as to which hormone would be more useful in a particular instance. In postmenopausal breast cancer estrogens were found to be significantly superior but, in general, premenopausal cancer is more susceptible to help. Each patient under treatment must be watched carefully, because an initial favorable response may be followed by reactivation. The same hormone therapy that alleviates the symptoms and signs of metastatic breast cancer in one case may accelerate the disease when employed in another instance.

BILATERAL ADRENALECTOMY AND OOPHORECTOMY

The use of androgens for metastatic breast cancer relies upon their depressive action on the production of estrogen. The next logical step therefore in the hormonal control of cancer was the destruction of the ovaries by X-ray or surgical removal. Even this maneuver did not abolish the excretion of estrogens from the urine and it was soon discovered that there was a compensatory hypertrophy and increased function of the adrenal cortex after castration. So the next step was the removal of both ovaries and adrenals which completely stops the excretion of estrogen and eliminates the tumor-stimulating hormone.

Nelsen and Dragstedt[24] reported on a three-to-seven-year follow-up of twenty-four consecutive patients with recurrent cancer of the breast treated by bilateral adrenalectomy and oophorectomy. Fourteen or 58 percent secured marked subjective improvement and survived an average of 44 months. Seven patients are alive after five years. The authors recommend this procedure as soon as metastatic lesions from breast carcinoma are diagnosed.

Reports are in the literature[25,26] of the regression of choroidal metastasis after removal of both ovaries and adrenals without any local eye treatment.

HYPOPHYSECTOMY

One of the indications for hypophysectomy listed by Luft and Olivecrona[27] is in the treatment of metastatic breast cancer. The rationale of the procedure lies in the removal of whatever tumor-stimulating hormones there may be in the pituitary secretion.

CASE REPORTS

CASE ONE

A white widow aged 65 and with no past history of eye trouble was examined on June 3, 1957. A disturbance of central vision in the right eye had been observed for the past nine days. The area of blurred vision had been gradually increasing in size and the central vision was becoming more dim with objects reduced in size and irregular in outline.

Central vision in the right eye was 20/40 with an increased hyperopic correction. The anterior eye was absolutely normal. The vitreous was clear. The focal area of the intraocular problem was immediately above the nerve head. There could be seen through a moderate edema of the overlying retina, a chorioretinal lesion of a gray reddish yellow color, about twice the size of the disc. It could be best described as a solid mass, invading the retina from beneath it. There was no elevation of the involved retina but there was considerable edema spreading upward, nasally and temporally. The nerve head itself was normal but the retina along the upper edge of the nerve was gray and hazy.

The edema of the temporal retina had extended downward to involve most of the upper half of the macular area and the fovea. The striking point of the fundus examination was the ease with which the lesion could be seen through the inner layers of the retina and the exact definition of the lesion that could be determined. There were no

hemorrhages but a few days later there was some minor pigment disturbance within the tumor mass and the adjacent retina. Central field study with a 1 mm. white test object and larger colored objects showed a wide area of depressed vision below the fixation, extending from beyond the normal blind spot well out into the nasal field.

Medical history revealed that the right breast had been removed in December, 1950, for adenocarcinoma without metastasis to the regional lymph nodes. The tumor proved to be the most common type of breast cancer, that is, infiltrating duct carcinoma. The patient had no further trouble until June, 1957, at which time (1) a nodule appeared in the right supra-clavicular region; (2) the onset of the problem in the right eye occurred; (3) X-ray of the chest showed no metastasis in the lung but some evidence of metastatic involvement of the ribs and right scapula. The nodule in the neck was excised and proved to be metastatic adenocarcinoma of the perineural lymphatics. There seemed every reason to believe that the patient was suffering from metastatic cancer and stilbesterol, 5 mg. three times a day, was prescribed.

Believing that the most reasonable diagnosis of the intraocular problem was carcinoma metastasis to the choroid, X-ray therapy was started directly to the lesion in the right eye. Between June 11, that was eight days after the original visit, and June 24, 1957, the patient was given ten radiation treatments receiving in all 2,000 roentgens (air). The physical factors were as follows: 250 KVP, 37 cm. target skin distance, ½ mm. Cu filter. A 3.5 cm. circular metal cone was used and at each treatment 200 air roentgens were administered. The estimated tumor dose was 1,500 roentgens. An attempt was made to protect the lens by having the patient look straight ahead and the metal cone was kept behind the outer canthus of the right eye. There was an immediate response to the treatments and by June 29, 1957 the lesion appeared entirely healed. All the retinal edema had disappeared and the central vision had returned to 20/20.

In November, 1959, that is two years and five months after the X-ray treatments, the vision in the right eye became slightly dim and a gold sheen was observed on the posterior capsule of the lens. The changes in the lens continued and eleven months later the vision was reduced to light perception. In October, 1960, an intracapsular extraction of the lens with complete iridectomy was performed. The operation and convalescence were uneventful and the patient is wearing a cornea contact lens with satisfaction and has 20/20 vision. There has been no recurrence of the choroidal metastasis.

Throughout this entire time the left eye has presented no problem and the vision is normal. The stilbesterol was continued until April, 1960, when the patient developed cryptitis in the left breast and the hormone was discontinued. Recent X-rays of the chest show calcification of the lesions in the ribs and scapula. At present the patient is receiving no treatment of any kind.

CASE TWO

A white, unmarried woman, aged 70, whose past eye troubles consisted only of refractions for hyperopia, was examined February 5, 1960, complaining of general cloudiness of vision in the right eye. The patient stated that on awakening, January 20, 1960, there was severe general cloudiness of vision in the right eye, there was no pain, and the left eye was normal. The initial examination disclosed a central vision of 20/30 in the right eye with an absolutely normal anterior segment. There was a moderate amount of blood in the vitreous but the nerve and macular area was quite easily seen and were normal. In the mid-portion of the upper temporal quadrant there was a rounded, whitish yellow mass measuring five disc diameters across with an elevation of two diopters. Along the upper inner edge of the mass there was considerable preretinal blood. There was no retinal edema and the scotoma in the field of vision corresponded to the size of the mass.

The medical history revealed that the patient had been treated in October, 1941, and for the next two years for a muco-epidermoid carcinoma of the right parotid gland. The treatment consisted of an original surgical removal with the first recurrence treated by X-ray and the second recurrence in late 1942 treated with radium. This treatment arrested the growth but extensive necrosis of the cheek and buccal surface could not be spontaneously cured. Final repair was effected by plastic operation. There had been no local recurrence in the intervening sixteen years. The medical history further revealed that a squamous cell papilloma, with no evidence of malignancy, was removed from the dorsum of the tongue in April, 1955. The lesion measured 5 mm. in diameter. It was elevated 1½ to 2 mm. and there has been no recurrence. Physical examination in February, 1960, failed to reveal any recurrence at the site of the parotid tumor nor any other area from which a metastasis might have arisen.

Hoping, however, that the mass in the right eye was a metastasis, X-ray treatment following the same schedule that had been employed previously was started the last week in February, 1960. Four weeks

later there was no doubt that the mass was shrinking in size. It was less elevated and becoming pigmented. The patient returned to New Hampshire and was seen again in May, 1960. The mass had completely disappeared and had been replaced by a flat pigmented scar. The vitreous was clear and there had been no more hemorrhages in the vicinity of the tumor. The central vision was 20/20. The left eye was entirely normal. The patient was quite well.

SUMMARY

This paper has attempted to present the diagnosis and management of metastatic carcinoma of the choroid. The diagnosis is easily made if the patient is seriously ill with metastatic cancer. In the absence however of gross metastasis the possibility of a chorioretinal lesion in the posterior pole being a metastatic nodule must be considered on the basis of the medical history and the ophthalmoscopic appearance.

In the discussion of the management, an over-all view of the problem has been presented. The ophthalmologist should not consider his care apart from the general management of the patient nor should he consider it as palliative treatment. Under the present day management of metastatic breast cancer, patients are living an average of three to five years whereas five to eight months used to be the expected survival time. Eye treatment must be planned so as to maintain all the vision that is possible for the longest life possible.

The local treatment to the choroidal metastasis has always been reasonably successful because most of the tumors that metastasize to the choroid are sensitive to radiation. The time honored use of X-ray and radium may be meeting a formidable challenge when isotopes, diathermy, and photocoagulation are employed to their full capabilities. The technique of newer local treatments must have advantages in simplicity or availability to overcome the high regard of radiation.

The methods and rationale of the general treatment of especially metastatic breast cancer has likewise been presented. The treatment to the eye may very nicely fit in as part of the general treatment. Regression of choroidal metastasis, under hormonal management either medical or surgical, without local therapy have been reported. Time only will determine if complete reliance can be placed upon this type of treatment to the exclusion of local radiation.

Finally this paper reports the successful treatment by radiation of choroidal tumors in two patients.

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DISCUSSION

DR. GEORGE R. MERRIAM, JR. It is a pleasure to discuss Dr. Simpson's interesting paper. I would also like to thank him for his courtesy in making a copy available prior to the meeting.

During the past 15 years we have had an unusual opportunity to observe and treat, at the Eye Institute and at the Memorial Center in New York City, approximately 40 cases of metastatic tumors affecting the eye or orbit. Two cases involved the iris and ciliary body, one the optic nerve, and nine the orbit. The remaining 28 cases all had choroidal lesions of varying severity. Eight of these have been lost to follow-up so that 20 patients, or 27 eyes, are available for evaluation. All of the patients were women ranging in age from 29 to 61 years with their primary lesion in the breast. The time interval between the diagnosis of the primary tumor and the appearance of the choroidal metastasis ranged from 1 month to 10 years, with an average of about 42 months. In this series of 20 patients the right eye was involved in 6, the left in 7, and both eyes in 7. This incidence of bilaterality is slightly higher than the figure of 25 percent given in the literature.

As Dr. Simpson has stated, there are several types of treatment available to these patients. In this series the results with hormones have been poor generally, although there was one excellent response. Similarly, ablation therapy has not shown any uniform response as far as the ocular lesions are concerned. Photocoagulation would seem to have limited effectiveness since about half of our series had detachments. In our experience the treatment of choice has been X-ray therapy. Most of the cases have been treated with 220–250 KV X-ray (HVL 1.0–2.0 mm. Cu) using a 3.5 to 5.0 cm. temporal field and doses of 3–4,000 r in air in 2–3 weeks, for an estimated tumor dose of 2,400 to 3,200 r.

Fourteen of the 27 eyes seemed to have benefited from the treatment as judged by improvement in vision and the retention of useful vision for the remainder of their lives. In 6 cases the response was dramatic with improvement from a pretreatment vision of HM to 20/200 to a final vision of 20/40 to 20/30. Improvement in vision could begin as early as 2 weeks after treatment and continue for as long as 2 months. The eyes that failed to respond to treatment were, in 10 of the 13 instances, the ones with retinal detachments. The age of the patient, whether pre or postmenopausal, seemed to bear no relationship to the response to therapy.

The average length of survival of these patients, once the eye was involved, is given in the literature as 8 months. It is interesting that, in this series, the average survival time was 8.5 months with a range of from 1 month to 3 years.

One of the unusual features of Dr. Simpson's first case was the development of a radiation cataract. The lens must have received a sizable fraction of the air dose—certainly about 1,500 r—for the opacity to appear in such a short time and progress so rapidly. According to our measurements the lens can receive less than 10 per cent of the air dose with the usual position-

ing of the temporal field, so that a lens opacity should seldom be anticipated. This complication was not observed in the 27 eyes reported here.

One of our bilateral cases, a patient of Drs. Reese and Wadsworth, is of particular interest. The right eye, which had a typical metastatic lesion in the upper temporal quadrant and an almost complete detachment of the retina, was not treated. The left eye had a metastatic tumor in the macular region with no detachment. This eye received a tumor dose of 3,200 r in 3 weeks with an excellent response. Normal vision was restored and the lesion clinically disappeared within one month after the completion of therapy. She died two months later and the sections showed viable tumor cells in the choroid. This case would seem to suggest that treatment does not necessarily sterilize the affected area. Rather it may simply produce sufficient regression to enable useful vision to be maintained for the remainder of life.

In the light of this case and the ultimate course of all of these unfortunate patients, our present treatment cannot be considered other than palliative. The eye is only one of many metastatic sites, as autopsy studies so clearly show, and our local therapeutic efforts do not alter the final outcome.

DR. FREDERICK H. VERHOEFF. Generally when an author covers a subject like this he leaves something that I can fill out from my past experience; however, in this case Dr. Simpson has covered the subject so thoroughly that he has left almost nothing for me to say.

There is one little point that I would like to speak of, and that is that in these cases separation of the retina occurs early and is complete. In case of the primary tumor you get separation of the retina early or late, but usually some of the retina sticks to the tumor and that enables you to make a diagnosis.

In these cases of metastatic tumor the retina comes off completely and usually the first time you see the patient is when he comes in with complete separation of the retina. I have found that in some of these cases the retina has become so transparent that one can recognize the tumor underneath the retina. In other cases, even if the retina has not become transparent you can see a whiteness back of the retina in some places, and that helps you to make the diagnosis.

I think the outcome in Dr. Simpson's two cases was perfectly remarkable. I wonder if he has had a good many others in which the patient departed this world a little early.

DR. SIMPSON. My closing remarks will be quite brief. I appreciate the prepared discussion by Dr. Merriam as well as the remarks by Dr. Verhoeff and wish to thank them.

I am sorry that Dr. Von Sallmann could not attend this meeting and present the case which I would like to briefly relate. The patient was a widow, 44 years old, and mother of four children all under 12 years of

age. Following right radical mastectomy she had lung and bone metastases which were apparently controlled if not cured by bilateral oophorectomy and adrenalectomy. At the same time she had bilateral choroidal metastases controlled by radiation. The entire medical history carried over six years and this lady is still quite well and earning a living as a secretary for herself and her family.

Statistical studies are valuable to compare one type of treatment against another but fail to present the dramatic side of what is accomplished in many instances by present day management of metastatic cancer.

Such achievements should make a great impression on all of us and we should not consider the management of choroidal metastasis as purely palliative. Each case should be treated with the same energy that we do other situations where we know the outcome will be more favorable.