counsel by Dr. Beery who reported to me that he had a case of intestinal obstruction, which was admitted to the Protestant Hospital about 8 o'clock the same morning. The patient M. B., age 17, a tinner by occupation, reported that he had been troubled for some three years with constipation which at times was very troublesome, and during all this time he had been compelled to take some laxative in order to obtain a movement of the bowels.

On Sunday morning, March 31, he felt some colicky pains which grew worse, but his attending physician was not called until the next morning. The usual remedies were resorted to for the relief of the obstruction but without avail. An examination satisfied the attending physician, as well myself, that we had an obstruction to contend with and consequently an operation was advised. With the assistance of Dr. Baldwin, the young man was operated on between 9 and 10 o'clock A.M. on April 3. On entering the abdominal cavity, we found the lower portion of the ileum corresponding with a horizontal line across the umbilicus, collapsed and empty, while that portion above the horizontal line was distended. On further examination a firm band about a fourth of an inch wide was found, which extended from the descending colon across the abdomen to the ascending colon on a line with the umbilicus. There were neither parietal nor intestinal adhesions, except at each end of this band. The end extending to the descending colon was firmly adherent to it, while the other end was firmly fastened to a narrow piece of omentum which in turn adhered to the ascending colon. At the juncture of the band with the strip of omentum was found a tumor, which I have the pleasure of presenting to you, about the size of the end of your thumb and which was entirely free from adhesions and had the appearance of an organized hematoma. It was pedunculated and hung down from the band like a plum from a twig. This band was ligated at each end and removed with the tumor. The abdomen was closed and dressed in the usual manner, and the patient is making a rapid and uninterrupted recovery without an abnormal change of temperature or pulse.

Our diagnosis as to the character of the tumor was subsequently confirmed by Dr. Fraker, the pathologist of the hospital.

There are some remarkable features in this case, which have evidently been the result of a hematoma of the omentum setting up a localized inflammation, followed with cell proliferation, building a band in this peculiar manner across the entire abdominal cavity which for years partially obstructed the peristaltic action of the bowels, allowing only the liquid contents to pass, but finally became so firm as to cause a complete obstruction which would undoubtedly have been followed with death had not operative interference been instituted.

CONCLUSIONS.

In studying these cases from a clinical standpoint we find that they divide themselves into two general divisions:

1. Those in which we are warranted in giving a favorable prognosis.
2. Those in which we may expect an unfavorable prognosis.

In the first case, notwithstanding we had a carcinoma of the pylorus and performed a gastro-enter-

ostomy in an aged party, who was almost devitalized from starvation, yet the result of the operation was favorable, because we were enabled to avoid septic infection. In the fourth case we had an obstruction of the intestine, which was occluded by a fecal mass, causing severe enteritis with enormous distension of the bowel, yet by removing the mechanical obstruction aseptically, the patient made an uninterrupted recovery. In the fifth case we had a mechanical obstruction of a different type caused by a band, which was also operated on aseptically with the most favorable results.

In the second class, consisting of perforations, we have in the two cases reported, two perforations of the stomach, both of which died from acute, violent, septic peritonitis within a few hours after its occurrence. In the third case we had a perforation of the bowel, producing the same general results as those produced by the perforation of the stomach, each one setting up an intense septic peritonitis which resulted in death in a few hours, notwithstanding an operation was performed in the third case for its relief.

A study of these cases, leads us to the legitimate conclusion that we are justified in giving a favorable prognosis where there is an obstruction without septic infection but, on the other hand, where there is *perforation* and *septic infection* we are not justified in giving a favorable prognosis; on the contrary, we should look upon such cases with fear and trembling.

In conclusion, allow me to repeat that I believe it is the duty of a surgeon, even in the face of the grave conditions which usually arise in perforation of the stomach or intestine, to operate and to seek to make the operation at the earliest possible moment after the accident. Without an operation we have nothing to hope for. With an operation there is a possible chance of saving a human life.

150 East Broad Street.

TUMORS OF THE EYEBALL.

(EXHIBITION OF SPECIMENS).

Read at the meeting of the Tri-State Medical Society, St. Louis, April 4, 1895.

BY WILLIAM H. WILDER, M.D.

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The study of tumors of the eye is of the greatest importance to the general practitioner, as well as to the specialist, for the reason that not only is the special sense endangered, but the life of the patient frequently depends upon the early recognition and prompt treatment of a neoplasm of this part. Our time will not allow a consideration of the tumors affecting the lids, lacrymal glands and other adnexa of the eye, but it is the purpose of this paper to discuss briefly the most frequent growths that attack the eyeball.

Tumors affecting the cornea primarily are, from the nature of this structure, exceedingly rare. Usually they spring from the edge of it where the conjunctiva passes over into the epithelial layer of the cornea. Of the benign growths may be mentioned dermoid, which is usually situated at the limbus, involving both conjunctiva and cornea. Rarely it is seen on the cornea alone, as was the case with the small microscopic specimen shown here. It appears as a grayish, or yellowish-white, rounded mass varying in size from half a grain of wheat to that of a hazel nut or even larger. It is usually single but it

may be a double growth. Its surface is smooth and may be sprinkled with fine hairs. It is of congenital origin and supposed to be caused by an inversion of the epiblast. It is seldom cystic, as are dermoids of other parts, but is a solid growth containing hair follicles, elastic fibrous tissue, sebaceous glands and other histologic parts of cutaneous tissue. It is not malignant, and although growing slowly, is not likely to recur after a thorough removal.

The irritation of the eye from the scratching of the hairs, and the unsightly appearance of the growth, however small, usually bring the patient promptly to the surgeon. The growth should be cautiously shaved off the cornea with a cataract knife, and the base lightly touched with a cautery if it should show signs of recurrence.

The malignant tumors that affect the cornea are sarcoma and epithelioma. Sarcoma, seldom, if ever, begins primarily in the cornea, but takes its departure from the limbus or sclero-corneal margin. It is almost invariably pigmented, of the type known as melano-sarcoma, and makes its appearance at times in a small pigmented spot which may have been thought harmless. This part of the eye normally contains pigment, more noticeable in a person of dark complexion, in whom a distinct ring around the cornea may sometimes be seen. It does not always infiltrate the cornea, but often grows over it, although it can be demonstrated that the epithelial layer of the cornea passes up on to the tumor. It presents either a smooth or a lobulated dark brown appearance, is firm to the touch and bleeds easily because of its great vascularity. Often a tumor in this situation is an outgrowth from a similar mass inside the eyeball, that has infiltrated the ciliary body and sclera and extended its ravages to the structures on the outside of the globe. The prognosis is grave.

Epithelioma is a rather frequent type of growth in this neighborhood. This may be explained, according to Fuchs, by the predilection that epithelioma has for attacking those parts where the epithelial covering changes its character as it passes from one part to another. Examples are familiar in the frequency of epithelial growths about the anus, the lips and the eyelids. We have an analogous condition in the limbus, where the epithelium of the conjunctiva passes over to that of the cornea. A small nodule appears at the junction of cornea and conjunctiva, and grows sometimes with great rapidity. Although occurring in advanced middle life, it does not invariably do so, according to Saemisch, but may also occur in young individuals. This growth spreads over the cornea, but does not infiltrate it except when it is quite advanced. Even then it is quite easily removed from the subjacent corneal structure. It presents a grayish-white, nodulated, sometimes distinctly papillated appearance, and is accompanied at times with severe pain. Often these epithelial cancers are deeply pigmented and this form grows to a great size, separating the lids and projecting from the palpebral fissure.

The question of attempting to save the eye, when sight is not affected, by carefully dissecting away an epithelioma or sarcoma from the cornea is an important one. When the growth is small and has not invaded the corneal or scleral tissue, it may be tried with some hope of success, but I am skeptical that anything short of enucleation will suffice to check

these malignant growths. Under the microscope, is a section of a small epithelial growth, removed about eighteen months ago from right cornea of a patient in the Illinois Eye and Ear Infirmary, but as he never reported again it is not known with what result.

It should be remembered that the nodule may be an outgrowth from an intra-ocular neoplasm. The danger of mistaking such a case for a localized sarcoma of the scleral region is not great if reasonable care is practiced.

Tumors of the iris are not common. Tuberculosis affecting this part appears usually in the form of reddish-gray tubercles situated at the root of the iris. These coalescing may form a distinct nodular mass, and with the increase of the growth there may be considerable pain, pericorneal redness and exudation into the anterior chamber. The growth may perforate the cornea or sclera.

Sarcoma of the iris may be of the pigmented or white variety; the former is the more frequent as well as more malignant. The disease may occur at any age; as a primary tumor of the iris it is rare, being usually an extension of a growth from the ciliary body. When the growth is of the melanotic type it is easily diagnosed. When of the white variety it may be confounded with tubercle, gumma or cyst of the iris. The former will probably show a conglomerate of tubercles of a dirty grayish color, situated at the root of the iris; a gumma will not be so distinctly circumscribed and there will be a syphilitic history, while a cyst will show a pearlish reflex quite characteristic.

These growths may be so small and circumscribed as to make it possible to successfully remove them by an iridectomy. This should be large enough to excise a considerable portion of the healthy iris around the tumor. At the first sign of recurrence, enucleation should be performed to prevent further spread of the disease. Cysts of the iris may be caused by either cysticercus or by the implantation of epithelial masses in the iris after a wound. We shall omit the consideration of them, as well as of naevi, which are congenital black patches or elevations and extremely rare.

Of all tumors affecting the eyeball, those most to be dreaded occur in the choroid, ciliary body and retina. According to Noyes, tumors of the choroid are met about once in fifteen hundred eye cases. Eighty-five per cent. of such tumors are said to be sarcomata, and of these the greater number are pigmented. Sarcoma may also spring from the uveal portion of the ciliary body. (Lawford and Collins in an examination of one hundred and three cases, report six affecting the ciliary body, one in the iris, two affecting both choroid and ciliary body, and ninety-four originating in the choroid behind the ciliary body.) Usually the growth attains a considerable size before it is recognized, unless affecting primarily the region of the yellow spot, in which case the impairment of sight brings the patient promptly to the physician. It is customary to divide the clinical history of these cases into four stages, according to Knapp:

1. A period of early growth before there is any irritation.
2. A period of inflammation.
3. Perforation of the eyeball and extension of the tumor outside the eye.
4. Metastasis.

In the first stage there may be no symptoms unless, as said before, the tumor encroaches on that part of the eye which is used for distinct vision. In this stage there may or may not be increased tension; although, as a rule, it is increased. If the physician is fortunate enough to see the eye during the first stage he may, by an ophthalmoscopic examination, discover the growth. He will then see a mass within the eye with a comparatively smooth surface, over which the retina is seen to pass. The retinal vessels are convoluted because of the lobular condition of the tumor; and the retina itself is bluish-gray in color. A careful examination with a bright light may show that the tumor is vascular. The duration of the first stage varies from six months to four years. Fuchs found the average to be in sixty-seven cases, twenty-one months.

Most authors have found that males are affected rather more frequently than females. According to Lawford and Collins, 57 per cent. of the former and 43 per cent. of the latter are affected.

This is a disease occurring generally after the fortieth year; the average age of the 103 cases of Lawford and Collins was 48.42 years. The average of 259 cases reported by Fuchs was 44.2 years. The average of cases reported by Freudenthal was 49.4 years.

With the beginning of the second stage there are signs of inflammation. The eye becomes painful and tender on pressure, the tension is increased, ciliary region injected, anterior chamber shallow and all the symptoms of acute glaucoma are present. In this stage there may also be bulging or staphyloma of the ciliary region, showing that the growth threatens to perforate the sclera. An interesting point, with reference to the subsequent history, is that the prognosis is more grave when the tension is increased; *e.g.*, Lawford and Collins found metastatic processes more frequent in those cases presenting increased tension before enucleation, than in those in which the tension was normal.

In the third stage the tumor escapes from the eyeball and invades the surrounding tissue. The pain and distension that were present before, now disappear because of the relaxation of the tension. The mass grows with much greater rapidity. Unfortunately many of the cases do not come to the surgeon until this stage is reached, when the chances of an ultimately successful operation are greatly diminished. The optic nerve is invaded in at least one-fifth of the cases, and the prognosis is thereby rendered more grave.

In the fourth stage metastasis occurs most frequently in the liver, though it may occur in the lungs, brain, stomach, uterus, or other organs. Fuchs found that 18.5 per cent. of his cases suffered from metastasis. Hirschberg gives 38 per cent.; and in 32.9 per cent. Lawford and Collins traced death to this cause.

One of the greatest dangers to the patient is that of local recurrence, which is diminished if the eye is removed before the tumor has reached a sufficient size to cause increased tension and local irritation. As mentioned above, the tables of Lawford and Collins show that more cases are fatal when the enucleation is performed after the tension is increased than if it is done when the tension is normal. Once the growth has burst through the eyeball, the dangers are greatly increased.

Fuchs records local recurrence in 31 out of 235

cases or 13 per cent. Freudenthal found 25 per cent. of local recurrences, 6 out of 24 cases, while Lawford and Collins note 8.86 per cent.—7 out of 179 cases. The danger of local recurrence is greatest within the first year.

Prognosis.—Lawford and Collins in a report of 103 cases subjected to operation, were able to trace 79—of this number 39 or 49.36 per cent. were alive at the time of the report. In twenty of these, an interval of three or more years has elapsed since the removal of the primary growth, and these are considered to be probable cures. This gives a percentage of recoveries of 25.31. The averages given by other writers vary from 6 per cent. by Fuchs to 38 per cent. by Freudenthal.

Metastasis has been known to occur eighteen and even twenty-five years after the removal of the primary growth—but whether the tardy occurrence of such processes should be regarded as metastatic is certainly a debatable question. However, the possibility of such an event, even after the lapse of many years, should make the physician extremely cautious in his prognosis, even though the patient is apparently cured. The therapeutics of this question has naturally been considered in discussing the symptomatology and prognosis; it can be summed up in a few words—excise the eye as soon as possible after the diagnosis has been made.

Glioma is the only form of tumor affecting the retina. It takes its origin from either the inner or outer granular layer, and in its growth may involve all the structures of the eyeball except the cornea and the lens. Histologically it is closely allied to round-celled sarcoma, being composed of small cells, sometimes with short processes having a large nucleus and a small amount of protoplasm. It is difficult to demonstrate this protoplasm except on freshly prepared specimens. The intercellular substance is slightly fibrillar, but mostly composed of a semi-fluid material which gives the whole mass a consistency like soft brain tissue. The neoplasm is bountifully supplied with blood vessels. In its growth it attacks the choroid, causing a proliferation of the cells of that structure, and separating it from the sclerotic by spreading in the loose connective tissue between these two coats of the eye. In this way it may pass beneath the ciliary body and appear in the anterior chamber.

The tumor grows from the retina in clusters, well illustrated in the specimens, which give it a nodulated appearance often distinctly seen with the ophthalmoscope. Foci of the growth may develop in the vitreous and choroid and spread as independent tumors. After filling the eye the sclerotic is attacked, its fibrous tissue infiltrated and softened, until the tumor escapes from the eyeball and invades the orbit. Or, even before the mass has attained a great size inside the eye, it may find a way of escape through the point of entrance of the optic nerve, along which it then extends. Having escaped from the eyeball, the neoplasm takes on a more rapid growth in the soft parts of the orbit, and soon it presses the lids apart and presents itself as a hideous fungous mass which bleeds easily. Death may be caused by extension backward to the brain, or the exhaustion consequent upon the involvement of other parts, either by continuity or metastasis.

Symptomatology.—Clinically, this disease, like sarcoma, may be divided into four stages. In the first

stage there is no increase of tension and no irritation. The parents of the child may discover that it can not see with the affected eye, and that there is a whitish reflex from the pupil. This condition was named by Beers (one of the earlier ophthalmologists), "amaurotic cat's eye."

An examination of the interior of the eye with the ophthalmoscope reveals the growth with its nodulated surface, and possibly with the retinal vessels passing over it. Numerous smaller vessels in the tumor may be seen. As a rule, the vitreous remains clear.

In the second stage, symptoms of irritation and inflammation appear. The eye becomes painful, the tension is increased, the episcleral vessels are injected, the pupil is dilated, the lens and iris are pushed forward and the details of the interior are no longer distinctly seen. The cornea becomes cloudy and may ulcerate. In the third stage, there is perforation of the eyeball and invasion of the orbital tissues. The fourth stage ends the case with either extension along the nerve to the brain, or metastatic processes in the lymphatic glands or other organs, chiefly the liver.

This disease is one of early childhood, occurring very rarely after the age of 10 and with greatest frequency during the first three years of life. Well authenticated cases are recorded by Knapp, Hirschberg, Vetsch, Lawford and Collins, in which the disease was congenital. Furthermore, it happens in about one-fifth of the cases that both eyes are affected at the same time, this symmetrical occurrence not being the result of extension of the growth from one eye to the other along the optic nerve, but an independent affair. The prognosis is absolutely fatal unless the eye is promptly removed.

If excision is performed during the first stage, and before the growth has invaded the optic nerve, there is some chance of recovery. The chances of cure are very slim, however, when the operation is performed in the second stage, when irritation and inflammation have already begun; and when done after the tumor has extended to the orbit, there is almost no hope, although a few cases of so-called recovery are reported, even after complete exenteration of the orbit was necessary to remove the growth.

One should not hesitate to enucleate both eyes if the growth is bilateral, for cases of recovery after double excision for glioma have been reported. Even where there is absolutely no hope, it may be the surgeon's duty to remove the eye, and even the contents of the orbit, to relieve the little patient of his suffering.

103 State Street.

PRE-COLUMBIAN LEPROSY.

BY ALBERT S. ASHMEAD, M.D.

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Dr. Muniz, of Lima, Peru, alone of all the authorities known to me, thinks that leprosy did exist among the Incas; he finds evidences of this in some ceramics, the *huacos*.

In the *American Anthropologist* for January, there is an article entitled "The Huacos of Chira Valley, Peru," by Samuel Mathewson Scott. This valley was once teeming with population, though scarcely populated now. In this part of the country, there are numerous ruins and graves, and Mr. Scott's excavations among these monuments of the past, enabled him to make a collection of Peruvian antiquities, now

in the Museum of the University of Pennsylvania at Philadelphia. All the pottery found in those burial grounds are called *huacos*. They are found by the side of the mummies. "About the heads of the mummies, whether male or female, were ranged the pieces of pottery in black and red clay which are known as *huacos*. These were probably filled with water or *chicha*—a beer made from corn, the beverage of ancient Peru. Upon these jars the artists expended all their skill. The clay itself is very finely worked; the designs are infinite in variety and imitate every form of animal and vegetable life. There are jars in the shape of bananas, gourds and melons; there are jars ornamented with human figures, climbing monkeys, pelicans, parrots, fish and serpents. These is, moreover, a distinct tendency toward the comic and grotesque—many animals have exaggerated teeth, and birds have quaintly elongated bills."

It is on these vases that Dr. Muniz claims to have found figures which can reasonably, if they must not absolutely be explained, by the intention of the artists to represent leprous effects.

Dr. Brinton, of Philadelphia, kindly invited me to examine the Peruvian antiquities in the Museum of the University of Pennsylvania. Under these antiq-

Huacos pottery of the Incas without deformation.

uities can only be understood: 1, hands and feet of mummies; 2, the *huacos*. For skulls are out of the question. "A leprous cranium," writes Hansen, "shows nothing peculiar, as the skull is never affected by leprosy." For the purpose of comparison with mummies' hands and feet, Hansen sent me photographs. (He writes: "You can see the ossa metacarpi, especially the first and the fourth, atrophied, and also the distal phalanges; the curvatures of the fingers are to be seen too.") of a leper's right hand in two attitudes, from Dr. Kaurin's collection of leprous preparations at Rekna leper hospital, Molde, Norway. It belonged to an anesthetic leper.

There is a large collection of *huacos* pottery in the Museum of Archaeology of the University of Pennsylvania. I examined it with Mr. Stewart Culin, the director. In none of the specimens was there any representation of face, hand or foot which could in any way be supposed to be indicative of leprosy. I also examined with Mr. Culin, mound-builders pottery¹ from the stone graves of mound-builders in Missouri. According to Mr. Culin's opinion, these specimens are unquestionably anterior to the Conquest. In them the following evolution is shown: First, there appears the simple form in clay of a gourd.² Next, the gourd changes to the representa-

¹ The mound-builders were the immediate ancestors of American Indians.

² Gourds and shells were mound-builders models.