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20

Metastatic Panophthalmitis

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20

METASTATIC PANOPHTHALMITIS.

By Charles J. Kipp, M. D., Newark, N. J.

Twenty-two years ago I published three cases of metastatic ophthalmia* in each of which the disease was confined to one eye. All of these patients recovered, but with the loss of the eye. In one of these cases puerperal pyaemia was the cause of the eye disease; in the other two a purulent inflammation of the middle ear was the primary disease. Since that time I have not seen a single case of metastatic ophthalmitis in connection with puerperal sepsis, which is doubtless due to the happily increasing rarity of puerperal septic affections. Surgical pyaemia or septic pyaemia is not so rarely met with, but eye disease must rarely occur in connection with it, as I have not seen other cases than those reported, in the various general hospitals with which I am connected and in which the attending surgeons invariably call my attention to cases in which an eye affection is developed while under their care. Although the cases below reported do not present any unusual features, so far as the eye disease is concerned, I believe they are of sufficient interest to the practitioner to warrant their publication.

CASE I. Appendicitis; Phlegmasia alba dolens; Metastatic Panophthalmitis both eyes.

This case was under the care of Dr. Edward Staehlin, to whom I am indebted for the following history:

*American Journal of Medical Science, 1884, p. 417.

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A woman, 54 years old, married, well nourished, and healthy except occasional attacks of indigestion of a mild degree, was suddenly taken sick 7 A. M. January 27, 1906, with severe pains of a colicky nature in the lower abdominal region, associated with painful and frequent micturition. These pains were located at the McBurney point. Rectal temp. 101, pulse 80. There was constipation and eructation of gas, no flatus. Renal colic was excluded because of normal condition of urine. Localized tenderness, elevation of temperature, constipation; and appendicitis was diagnosed because of these symptoms—appendicitis with posterior attachment or involvement, probably in close proximity to ureter.

Operation 5 P. M. on same day, substantiated the diagnosis. The wound was sewed up tight, and a favorable prognosis given. She passed an uneventful week and the dressing was changed; primary union; felt well; ate well, and she was assured she might go home at the end of her second full week. During the night of the eighth day she was sleepless, restless, temperature ran up from 99 4-10 to 102 6-10, pulse 108. Next morning the left leg was very much swollen and painful and by evening a well-marked phlegmasia alba dolens had developed. In nine days her temperature was again normal and remained so until the 10th of March; by this time the limb had become normal in dimensions. She felt well in every way, her digestion was good and we planned for her return home. During the

night of the 10th of March the temperature shot up to 104 6-10; she vomited undigested food and had profuse watery stools containing particles of undigested food (12 stools in twenty-four hours). In next twenty-four hours, 4 watery stools. From this time her stools continued loose up to the time of her death, March 29. From March 10 to March 14 her temperature had gradually come down from 104 6-10 to 100, then rose again to 104 and from that time, March 14, to March 29 had fluctuated between 101 and 104. The sudden onset of the diarrhoea and the persistence of the watery character made me think of mesenteric emboli. March 14 she complained of very severe pains in her knees which were very agonizing but intermittent; there was no effusion. Blood examination March 18: normal, no streptococci demonstrated, no leucocytosis.

March 18 she developed eye symptoms, first in right eye, a day later in left, the onset was very rapid. Dr. Kipp saw her at this time. She complained of much impairment of sight. The eyelids became red and swollen. The eyeballs began to protrude. The conjunctiva was oedematous. The cornea hazy, the aqueous humor was turbid. The iris was discolored and mostly covered with a purulent exudation. The pupil was small and filled with exudation. The cornea was insensitive. No ophthalmoscopic examination could be made. The left eye was not much protruded and there was not so much swelling of the ocular conjunctiva, but otherwise it was about in the

same condition as the right. On the following day she was totally blind. She did not complain of much pain in the eyes. Warm water compresses were applied and a solution of sulphate of atropine 1 per cent. was instilled every three hours. The treatment had, however, no effect whatever on the eyes which continued in about the same condition up to the time of her death—eleven days after the beginning of the ophthalmia. No perforation of sclerotic or cornea occurred. From 18th to 29th March she continued in this condition: Bowels loose, sometimes moved involuntarily; abdomen at times markedly distended; occasional nausea and vomiting. Urine—spec. gr. 1020-1015, trace of albumen and a few hyaline casts. Mind clear at times, alternating with mild delirium. No autopsy could be obtained.

CASE II. Septico-Pyaemia following lacerated wound of foot and leg; acute ulcerative endocarditis; metastatic panophthalmitis of both eyes. Death 45 days after injury.

M. D., an Italian 15 years of age, was admitted to the City Hospital February 25, 1906. Family history negative. Five days before admission his left foot was caught between elevator and platform; foot was badly crushed and bled profusely. The physician who first saw him sutured wound with catgut. On admission his general condition was fair, the heartbeat rapid and strong. No dullness of lungs, but large and

small rales through both lungs; breath sounds roughened. Abdominal organs negative. The left foot was badly crushed, a lacerated wound about two inches in length on inner side of foot which had been tightly closed by catgut sutures some days before by a surgeon outside of the hospital; foot and leg up to knee were swollen and discolored. Temperature 103 4-10, pulse 130, respiration 24. The sutures were removed and incisions made in foot and leg, wet dressing of bisulphite of sodium was applied and the limb put in a right angle splint.

The treatment failed to prevent the spread of the inflammation upwards and it was thought best to make further multiple incisions higher up on March 3. Brewer's yeast was substituted for the bisulphite of sodium dressing, but as it was apparently without effect the former dressing was again applied. By March 20 the disease had extended up to the left buttock and four days later it had spread to the right buttock. He was put under ether and extensive and deep incisions were made in the parts affected, which evacuated large quantities of pus. During this period the patient had been rapidly losing weight and strength. Symptoms of endocarditis were first observed on or about March 24—about thirty-two days after the receipt of the injury. The left eye first showed signs of inflammation on April 7. There was not much injection of the ocular conjunctiva and no swelling of the lids. The cornea was de-

cidedly hazy, the anterior chamber of normal dimensions, the aqueous humor was turbid and the iris was covered with a thick layer of yellowish white exudation, the pupil was small and filled with the same exudation. No ophthalmoscopic examination could be made. The eyes did not seem to give him any pain, but patient was so apathetic at this time that no answer to questions were given. On the following day a very similar condition was found in the right eye. He was totally blind. There was no great change in the appearance of the eyes during the following days. He died four days after the eye affection was first noticed.

An examination of his urine made February 27 showed a trace of albumen, no casts, no sugar. On March 25 the urine was of specific gr. 1010 and contained a large amount of albumen, and granular casts but no sugar. An examination of his blood made April 9, two days before his death, showed streptococci in cultures. The secretion from his leg also contained streptococci. The temperature rose to 105 3-10 on the day after his admission and during the following week it ranged from 99 to 104; during the next week it fluctuated between 99 3-10 and 104 4-10. During the remainder of his life about the same fluctuations as previously noticed continued. His pulse beats up to a week before his death ranged from 90 to 144, after that time over 160 and four days before his death it was so weak that it could scarcely be felt. The

medical treatment consisted of digitalin gr. 1-100, strychnin sulph. gr. 1-40 every three hours. Morphine was given occasionally for the relief of pain. He was fed on milk and eggs and in the last week was given egg-nog freely.

Autopsy, April 12, 1906, by Dr. Charles A. Teeter: Build slight; musculature small; no deformities; left foot badly discolored and misshapen; open wounds in left thigh and leg with thin yellowish pus exuding. Skin—yellowish in color, dry and hard. Hair—scanty, shiny and dry. Teeth were in fairly good condition. Muscles were small and flabby; rigor mortis was absent except in elbows. Panniculus was very scanty, there was no oedema present; body-heat was absent; hypostasis was well marked over back and shoulders. Head was not examined internally. Both eyes: found cornea cloudy, partially collapsed and pus in anterior chambers. Eyes, both removed.

Thorax: Pericardium was not distended; fat somewhat increased. Heart: Auricles distended, filled with fluid, blood and ante-mortem clots; right ventricle slightly enlarged; valves (tricuspid) normal; left ventricle was enlarged; the walls hypertrophied slightly; the mitral valves showed some areas of calcification and the aortic valves several areas of recent ulceration and small areas of calcareous deposits; the valvular flaps were completely ulcerated through in places. Acute ulcerative endocarditis. Lungs showed fresh pleuritic adhesions, tear easily;

chronic passive congestion and oedema; a thin yellowish purulent substance in small bronchi; the lungs containing air throughout.

Abdomen: Peritoneum was moist and shiny; fluid not excessive; no adhesions. Spleen was soft and capsule adherent; anaemic infarct size of a silver quarter in left upper portion; rest of pulp very soft. The kidneys were rather small; fat small in amount; capsules stripped rather easily; cortices slightly atrophic; cloudy swelling and beginning degenerative changes and passive congestion. In pelves small amount of thin watery purulent material, also in pyramids. Beginning pyo-nephrosis. Stomach was distended, containing thin foul smelling material, but there were no pathological changes. Intestines, small and large, negative. Liver was rather large—nutmeg-liver, passive congestion, no infarcts seen, gall bladder—negative.

For the history and the notes of autopsy I am indebted to the House Staff of the City Hospital.

MICROSCOPIC EXAMINATION OF LEFT EYE

BY DR. GEORGE S. DIXON.

When the globe was divided an exudate was found in both the anterior and vitreous chambers, which was partially flocculent in character. The greater portion of the exudate within the vitreous chamber was lost during manipulation, and hence does not show in the preparations. The retina

was thrown into folds by contraction of the sclera. The lens was found in the posterior portion of the globe embedded in ice (the eye had been frozen) in such a condition and position as to lead us to believe that the dislocation was due to the globe having been allowed to fall, rather than to any pathological process.

Sections show the corneal epithelium in fairly good condition, and Bowman's membrane well marked, but the cornea propria is moderately and evenly infiltrated with small round cells; pannus not present in any of the sections examined. Descemet's membrane is present, but its epithelial lining has disappeared. The iris angle, spaces of Fontana, and canal of Schlemm are obliterated. The anterior chamber contains pus, and a granular exudate with streptococci in large numbers. The iris is swollen and infiltrated with small round cells. The ciliary body and processes are in the same condition, but to a less degree, and a cyclitic membrane is present. The lens, aside from being shrunken and somewhat distorted, is slightly cataractous in the zonular region. The capsule is intact. A purulent exudate surrounds the ciliary processes, and a layer of the same is in contact with the inner surface of the retina.

The inner layers of the retina are in fairly good condition, and the pigmentary layer appears to be intact, but the bacillary layer and the external limiting membrane have undergone granular degeneration and in some locations seem to be

somewhat thickened. The choroid is not thickened to any extent, but is filled with small round cells. The sclera shows isolated colonies of small round cells. The sheath of the nerve is thickened, the nerve appears to have been oedematous, and papillitis present. The intervaginal space and nerve also carry numerous small round cells. The infection was due to streptococcus pyogenes longus, the staining reaction of which is peculiar. The germ stains well with Löffler's blue, but does not stain by Gram, nor with dilute Ziehl. We have concluded that this is probably due to the manner of preparation of the globe.

Diagnosis: General uveitis with hypopyon and interstitial keratitis.

Groenouw, in Graefe & Saemisch (*Handbuch d. Gesamten Augenheilkunde*, 2 te Auflage, Band XI, p. 504) has collected all cases on record of surgical pyaemia in which the eyes were affected. His cases number sixty, of which twenty-six were injuries and operations. As cases of this kind are quite rare and are usually put on record, he thinks that from the following statistical information, derived from his table, a fairly accurate picture may be constructed. The age of the patients varied from one day to sixty-nine years and was on an average thirty-five years. More than one-half of the patients were between twenty and fifty years; one-fourth were more than fifty years old. Among fifty-two persons were forty-one men (79 per cent.), corresponding to the well-known experience

that men are more exposed to traumatic injuries leading to pyaemia. The outbreak of the eye disease occurred between the first and forty-fifth day. The course of the eye affection was in no way influenced by its early or late appearance. In the cases ending fatally the duration of the disease was between twelve and one hundred and fifty-three days. On the average it was thirty-six days. Death occurred between the first day and the fifth month after the beginning of the eye disease, on the average on the twenty-fourth day.

Among fifty-three cases there were sixteen bilateral and thirty-seven unilateral cases of ophthalmia. Of the first seventy-five per cent. died, of the latter only fifty-four per cent. The above shows clearly the malignity of the bilateral cases in surgical pyaemia but not as markedly as in the puerperal form. In the four bilateral cases that survived, the ophthalmia developed in both eyes at the same time and ended in panophthalmitis. The unilateral ophthalmia was found mostly in mild cases, but not by any means without exception, and the bilateral ones in cases of severe pyaemia. Endocarditis is more rarely found in surgical pyaemia than in the puerperal form. But if we compare only the cases with metastatic ophthalmia in both forms of pyaemia the difference is but slight. Of the persons in whom the ophthalmia was the only metastasis twenty-five per cent. died, and of those with metastasis in other organs eighty-four per cent. succumbed.

With regard to the pathology, Groenouw says: "The metastatic ophthalmia is caused by the entrance of septic masses into the capillaries of the eye and in the bilateral cases it is exclusively or predominantly in the retina, and in the unilateral cases also in the uvea (Axenfeld). The infectious masses must be mostly very minutely divided, which in other parts can pass freely and are caught in the very narrow capillaries of the retina. The rapid loss of vision is not to be regarded as the result of the embolism, but rather as the effect of a rapidly developing inflammation.

The disposition of the eye for metastases is explained by the narrowness of the capillaries of the retina. (This is also the reason why the ophthalmia is not rarely the only ascertainable metastasis). Other factors are disturbances in the circulation, perhaps the formation of thrombi in the retina and choroid (Axenfeld). The assertion made by some writers that the metastatic ophthalmia is due not only to micro-organisms, but can also be produced by the action of toxins is as yet unproved. The absence of bacteria in the microscopical preparation is by no means proof that they were absent during life. A negative result of the examination is of no value also in cases in which the disease has lasted three months. The micro-organisms which have been found in the metastatic ophthalmia are the streptococcus, staphylococcus pyogenes, pneumococcus, and a few not clearly defined bacteria."